

imc STUDIO 2026

What is new

Doc. date created: 2026-09-17



Disclaimer of liability

The contents of this documentation have been carefully checked for consistency with the hardware and software systems described. Nevertheless, it is impossible to completely rule out inconsistencies, so that we decline to offer any guarantee of total conformity.

We reserve the right to make technical modifications of the systems.

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A list of the open source software licenses for the imc measurement devices is located on the imc STUDIO/imc WAVE/imc STUDIO Monitor installation medium in the folder "*Products\imc DEVICES\OSS*" or "*Products\imc DEVICEcore\OSS*" or "*Products\imc STUDIO\OSS*". If you wish to receive a copy of the GPL sources used, please contact our tech support.

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Update

Along with the PC software imc STUDIO, the software comprises components such as the firmware and devices driver packages imc DEVICEcore and imc DEVICES. With a firmware update, the firmware can be loaded into the system. Please check regularly whether any new software/firmware versions are available and perform an update if your version of imc STUDIO supports the new firmware. Further information can be obtained from our tech support or the imc website.

Download links:

imc STUDIO <https://www.imc-tm.com/imc-studio/software/>

imc DEVICEcore and imc DEVICES as a driver package for imc STUDIO

The drivers and firmware components for imc devices are provided in "imc DEVICEcore" and "imc DEVICES". Thus, at least one of the two driver packages is a necessary requirement for operating imc devices under imc STUDIO.

- imc DEVICEcore: For devices belonging to the [firmware group B](#)²⁷⁷ - e.g ARGUSfit, EOS
- imc DEVICES: For devices belonging to the [firmware group A](#)²⁷⁷ - e.g. CRONOS family, C-SERIES, SPARTAN, BUSDAQ

Both packages can be installed and operated in parallel. The software and the devices automatically apply the appropriate package.

 **Notes**

Compatibility between imc STUDIO and imc DEVICES

In regard to the use of imc DEVICES as the device driver, there is a clear distinction determining the compatibility of versions/version groups:

imc STUDIO version	assigned firmware / version group	additionally compatible
2022	2.15	2.14
2023	2.16	2.14, 2.15
2024	2.17	2.14, 2.15, 2.16
2025	2.18	2.14, 2.15, 2.16, 2.17
2026	2.19	2.14, 2.15, 2.16, 2.17, 2.18

For version 2026, the applicable rule is: the assigned version group and all **predecessor groups going back to 2.14** are compatible with the imc STUDIO-version used.

Introduction

Developments in imc STUDIO 2026 focused on various aspects. On the following pages, you will find an exact enumeration and description of the changes.

The imc team wishes you total success in accomplishing your measurement tasks with imc STUDIO.

imc STUDIO 2026 R1

1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.19 R1](#) 
- [Firmware imc DEVICEcore 3.9 R1](#) 

1.1 Firmware imc DEVICES 2.19 R1

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
IRIG-B tolerance	A new option has been added to the Device Properties dialog box that allows you to set the tolerance for IRIG-B synchronization.

1.2 Firmware imc DEVICEcore 3.9 R1

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
ARGFT/CAN-FD	Dynamic Transmission of Analog Channel Data The software now supports the dynamic transmission of analog channel data. The new Dynamic Transmission operating mode enables real-time output of analog channel values. DBC import with channel filter A channel filter dialog is now available during DBC import. This allows selecting and importing only a subset of the channels contained in the DBC file. DBC import: updating and merging existing configurations DBC import now also supports updating and merging with an existing CAN configuration. This allows new or modified content from a DBC file to be transferred into an existing configuration without having to recreate it completely.
microSD	exFAT support for microSD Cards with Improved Performance The latest version of imc STUDIO introduces support for the exFAT file system on devices in device group B11 . While exFAT could be used previously, it was subject to performance limitations; however, a native exFAT driver is now available in the Linux kernel. This results in a noticeable improvement in real-world performance. Benefits at a Glance: • Simplified Handling No additional tool is required to prepare microSD cards for use. You can format them directly using Windows' built-in tools. • Optimized Performance for Flash Memory exFAT is specifically designed for flash-based storage media such as microSD cards. This allows you to benefit from a higher data rate and more stable performance during measurement operations.
Measurement folder from triggered events	For triggered measurements where data is stored in the device, triggered events can now be saved in flat measurement folders instead of subfolders. This simplifies the process of downloading and analyzing measurement data, for example, during unattended measurements.

Area	Description
imc Online FAMOS function library	imc ARGUS devices now additionally support the following functions:
	Control
	SingleValueChannel A virtual channel that has no time base but is explicitly appended by a value in response to specific events, such as after each detected pressure pulse.
	VectorChannel A segmented virtual channel or matrix in which new segments are not appended based on a clock cycle, but rather explicitly in response to specific events. It functions like a combination of multiple SingleValueChannel channels. This is efficient, for example, for storing one measurement value from each strain gauge channel at every load stage during static strength tests.
	VectorChannelSet Appending a new segment to a VectorChannel.
	System
	GetDateTime GetDateTime() determines the current date and time. Seconds are returned with an accuracy of 1/64 s. Only local single values are allowed as parameters; channels are not permitted. Unused parameters can be replaced with 0.



imc Online FAMOS

Processing of digital input bits and digital ports has been expanded.

2 imc Inline FAMOS



Function library

The following function is also available in imc Inline FAMOS:

System	
GetDateTime	GetDateTime() determines the current date and time. Seconds are returned with an accuracy of 1/64 s. Only local single values are allowed as parameters; channels are not permitted. Unused parameters can be replaced with 0.

Extended support for virtual channels

imc Inline FAMOS can now process virtual channels created with imc Online FAMOS on devices of [device group B11](#)  ²⁷⁷.

3 imc STUDIO GoPro



Support for video recording with imc STUDIO GoPro and a GoPro video camera has been discontinued.

4 Scripting / API



Migration to .NET Core 8.0

With this version of imc STUDIO, the interface's technological foundation has been modernized. The goal is to improve the future-proofing, maintainability, and performance of the development environment.

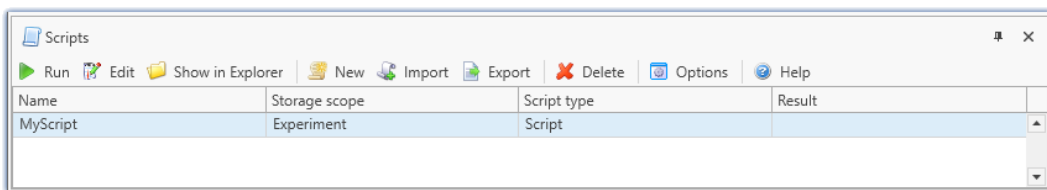
4.1 Scripting



The **imc STUDIO Scripting** is an **imc STUDIO** plug-in that provides a C# and .NET-based programming interface for creating additional features for customized workflows.

Major Change

- Various development environments (script editors) are supported for editing code; you must install them separately. We recommend Visual Studio Code or Microsoft Visual Studio. SharpDevelop is no longer included and is no longer supported.
- The .NET SDK is required and is installed by default with imc STUDIO.
- Existing scripts are converted automatically to the greatest extent possible. However, manual adjustments may be necessary for more complex scripts:
 - During conversion, the system attempts to incorporate any changes the user has made to the .csproj file. However, this cannot be guaranteed.
 - Some Microsoft classes and functions, as well as NuGet packages, etc., behave differently in .NET Core (8.0) than in .NET Framework 4.8.
- Since there is no longer a "Global Assembly Cache" (GAC) in .NET Core (8.0), registry entries are used for DLL directory name resolution.
- Users can specify which version of imc STUDIO they want to use with this script by changing the version number in the <IMCStudioPath> tag of the .csproj file, if multiple versions are installed at the same time.
- The menu bar and context menu have been updated and optimized:



Tool window "script"

- As usual, you can find detailed information about Scripting in the manual.

4.2 imc API



Major Change

- The interface now uses only .NET Core (8.0).
- Previous .NET Framework dependencies are no longer supported.

Updated System Requirements

- The following requirements for developing with imc API have changed:
 - Development environment, including a compiler for the .NET programming language (e.g., Visual Studio 2022 or later)
 - .NET Core (8.0)

Unchanged Requirements

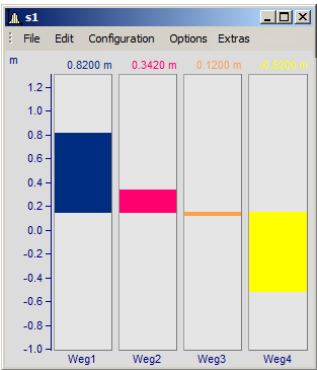
- All other requirements for development and integration remain unchanged.
- As usual, you can find detailed information on this in the manual.

5 Curve Window

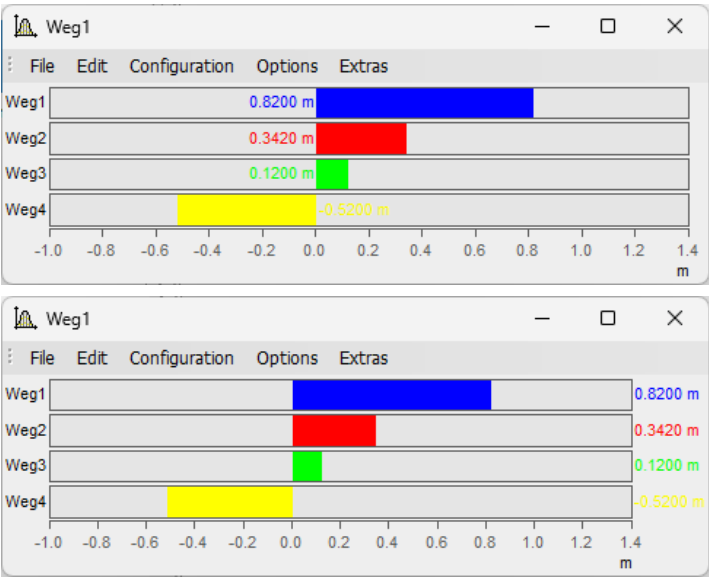


New display type: horizontal bar instrument

In addition to displaying the last value as a number, there is the alternative of displaying it as a vertical or horizontal bar. Its height/width is determined by the last value in the data set. This display is particularly useful for online presentations, where the bar height/width and color allow for a quick overview, even across multiple channels. Various color schemes, tolerance monitoring, and slave pointers are included.



until now



new in imc STUDIO 2026 R1

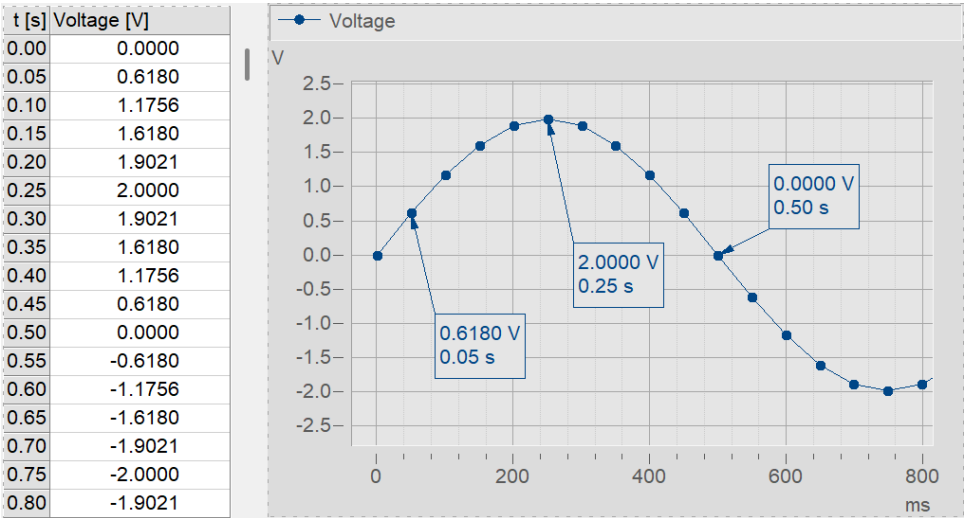


Snapping markers and measurement cursors to samples (🔍➡)

Markers and measurement cursors can now snap directly to the actual data points (samples). This allows measurement values to be read precisely and unambiguously without having to manually move the cursor to the presumed correct position.

As the cursor position on the screen is fundamentally based on a pixel grid and physical values are calculated from this grid position, it has previously been a challenge to hit the exact desired measurement point. To overcome this limitation, cursors can now be ‘snapped’ to a specific sample using the Ctrl key. In this mode, the cursor remains within the image grid but reliably captures the values of the corresponding measurement point.

In addition, the options for graph customisation, the handling of markers and the overview zoom function have been further improved, making navigation and analysis significantly more intuitive and efficient.



6 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Scaling Issue (Reference #044826)	When using CRONOS amplifiers with changing user-defined scaling, there were rare situations where you could experience inconsistent updating of that scaling. Loading and directly starting an Experiment has always been safe and not affected by the following scenario! Only, when manually modifying an existing experiment, resulting data could have been erroneous, differing from indicated scaling in the GUI. Typical situations to be considered are the use of load cells and pressure sensors. A simple workaround ("Reconfigure") could fix the situation and is applicable with all former Software versions. Starting with imc STUDIO 2026 R1, this workaround is no longer necessary; scaling errors have been fixed, and experiments with such issues are no longer generated.  Further detailed information on this topic - including behavior in previous versions, conditions under which the issue occurs, possible consequences, and workarounds - can be found here: https://www.imc-tm.com/service-training/customer-service/STUDIO-scaling
Setting Up - Software	New Installation Process The installation process has been optimized: Going forward, the installation will take place without a forced restart and without locking up the computer during installation. The installation process takes typical IT environments into account (e.g., restricted admin rights) and prevents interruptions caused by premature restarts.
Setup - Devices	During Preparation and when Starting the Measurement, the Logbook displays the calculated PC memory requirement. This entry supports the assessment of the memory requirement of the current configuration and indicates possible limitations when only little free memory is available.
Sequencer	System requirements NumPy 64 bit: support of NumPy 2.5 System requirements Python 64 bit: support of Python 3.14.6
imc Format Converter	The format converter has been enhanced to support export to the Apache Parquet format, so that measurement data can now be automatically converted to Parquet files via the sequencer, for example, to make it easier to upload them to cloud data management systems.

Update-notes and compatibility from 2025 to 2026

If you are planning to upgrade from version 2025 to 2026, there may be aspects to consider when using imc ARGUSfit devices or scripts. In particular, please note the following:

Area	Function
imc ARGUSfit - downward compatibility of experiments	Certain experiments involving imc ARGUSfit devices and using imc Online FAMOS calculations cannot directly be loaded in imc STUDIO 2026 R1. The reason for this is an internal change to improve the robustness of imc Online FAMOS calculations in connection with triggers. To avoid the propagation of incorrectly stored trigger assignments, even certain experiments without any trigger use get rejected. The effect is that the device is deselected after the experiment is loaded. Panel pages and similar elements remain unchanged. To work around the problem, please export the experiment and send it to our technical support, mentioning Reference #044474. A manual workaround of the problem is also possible if you still have the previous version of imc STUDIO installed: 1. Open the old imc STUDIO, for example V2025 R5. 2. Load the experiment in the old imc STUDIO. 3. Open the OFA Editor. 4. Save the OFA source text as an OFA file. 5. Remove the OFA source text from the experiment. 6. Close the OFA Editor. 7. Prepare the experiment. 8. Save the experiment under a new name. 9. Export the experiment. 10. Close imc STUDIO, for example V2025 R5. 11. Open the new imc STUDIO 2026 R1. 12. Import the experiment exported with the old imc STUDIO. 13. Open the OFA Editor. 14. Load the previously saved OFA file. 15. Perform the syntax check. It should now complete successfully. 16. Close the OFA Editor. 17. Start the measurement. 18. Check whether the measurement data is displayed in the curve windows as in the old imc STUDIO.

Scripting	Please refer to the notes in the Scripting section  .
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 **Note**

Update from Version 5.2

If you are updating from version 5.2, please also note

- the [update notes for version 2023](#) 
- the [update notes for version 2022](#)  and
- the [missing components and features in version 5.2](#) 

Additional missing components and functions belonging to Version 5.2



Optional components:

- Video

Individual functions:

- Textual Report channels: The Report channels are deleted from the experiment when it is loaded.
- Data Browser: Deactivation of grouping according to category.
- Data Browser: Check-in and Checkout of measurements in the Data Browser.
- Load measurement settings / Traceability of measurements
- Panel: Navigation Bar
- Deactivation of the component "*imc STUDIO Project Management*"

Archive

1 imc STUDIO 2025

1.1 Introduction

Developments in imc STUDIO 2025 focused on various aspects. On the following pages, you will find an exact enumeration and description of the changes.

The imc team wishes you total success in accomplishing your measurement tasks with imc STUDIO.

1.2 imc STUDIO 2025 R5

1.2.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- Firmware imc DEVICES 2.18 R5
- Firmware imc DEVICEcore 3.8 R5

1.2.2 imc Online FAMOS



Editor

In some screen configurations, the Online FAMOS editor sometimes showed display errors.

OFA channels

Individual virtual channels from imc Online FAMOS sporadically remained empty in some scenarios, which also disturbed the eventual measurement stop.

1.3 imc STUDIO 2025 R4

1.3.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- Firmware imc DEVICES 2.18 R4
- [Firmware imc DEVICEcore 3.8 R4](#) 

1.3.1.2 Firmware imc DEVICEcore 3.8 R4

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Device configuration	Trigger events can be flexibly stored in individual files, either directly on the device or on the PC.

Area	Description
Channel configuration	Taring support for CANSAS<i>fit</i> in ARGUS integration Applications such as current clamps with unavoidable and varying DC offset require a tare function to enable easy zeroing before field measurement. imc CANSAS<i>fit</i> modules, in conjunction with the CANSAS software, also offer a "voltage measurement with zero balancing" mode. With the CANFT modules UTI-6, HISO-UT-6, and HISO-HV4 directly clicked to an ARGFT base unit, channel taring can also be initiated via the imc STUDIO interface.

1.4 imc STUDIO 2025 R3

1.4.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- Firmware imc DEVICES 2.18 R3
- [Firmware imc DEVICEcore 3.8 R3](#) 

1.4.1.2 Firmware imc DEVICEcore 3.8 R3

Hardware

6 channel measurement amplifier for pulse signals & incremental encoder sensors

The ENC-6 from the imc ARGUSfit series is used as a pulse counter for measuring speed signals supplied by incremental encoders and other sensors with pulse signals. These signals can be used to record the following variables: angle and displacement, rotational speed (RPM) and speed, frequency, time and phase shift, PWM (duty cycle), event counting, digital input status.



imc ARGUSfit-ENC-6

imc ARGUSfit-ENC-6 - at a glance

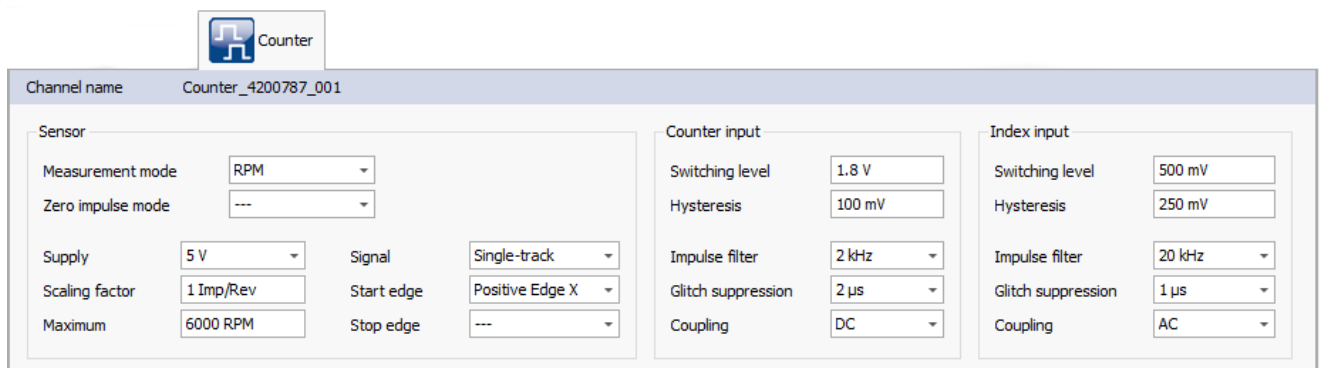
- High sampling rate or data output rate up to 100 kHz
- Measured values based on high-resolution time evaluation with 100 MHz counter clock
- Comprehensive analog signal conditioning: differential input amplifiers, configurable analog filter, adjustable threshold and hysteresis, digital glitch filter, galvanic isolation for ground loop suppression
- 2 galvanically isolated groups, each with 3 channels and an additional index track
- Dual-track evaluation (4 edges) of quadrature encoders with and without index
- Methods for zero position detection: Index signal and missing teeth
- Dual functionality: Digital Input recording function for all available 10 signal tracks, Port or Bit-wise, (with full signal conditioning and configurable level thresholds)
- Multiple trigger options based on all input and output variables
- Extrapolation function for accumulated variables and events
- Isolated sensor supply 5 V / 12 V, for powering transducers
- Robust, small, and compact: clickable into imc ARGUSfit systems

Typical applications

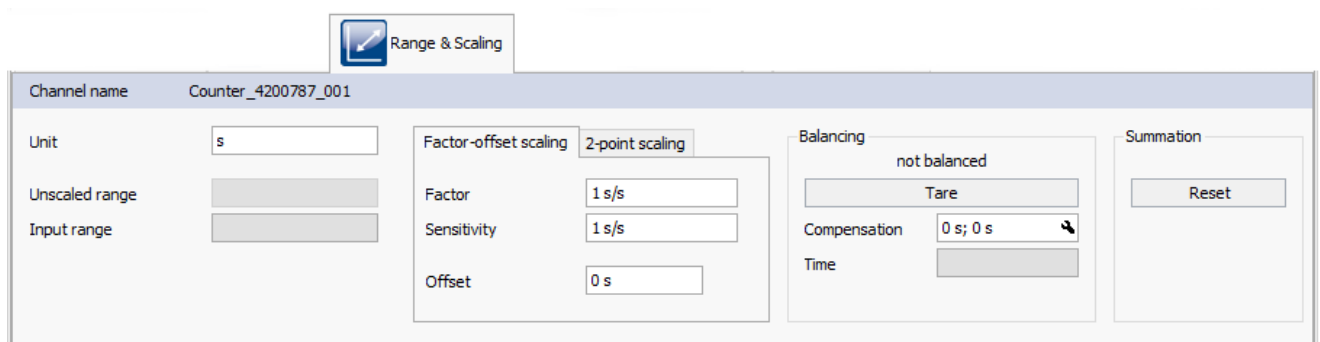
- Not only for well-defined TTL signals, but also for reliable use of transducers and sensors with unclean and noisy signals, thanks to sophisticated analog conditioning.
- Incremental encoder sensor (single or dual track, quadrature and/or direction of rotation, w/wo index)
- Sensors with complementary digital output signals (e.g. RS485)
- Passive inductive transducers and sensors with analog output signal
- Speed detection by magnetic pickups and gear wheels with "missing teeth"
- Light barriers
- Torque transducer systems with frequency output signal

What's new compared to, for example, the imc CRONOScompact-ENC-4?

Category	Function / Feature	Description
Hardware	Configurable zero pulse	Adjustable threshold, hysteresis, coupling, and input low-pass filter
	Sensor supply	Integrated 5 V or 12 V power supply for external sensors; power is sufficient for the Optel Texys 152G7 5V speed sensor (5 V, 80 mA), for example
	FPGA data processing	Real-time processing with high data rates up to 100 kSps
	Overload indication	Channel LED directly indicates overload
	AC coupling	Can be activated for suppression of DC components
Signal processing	Output filter	Low-pass filter, anti-aliasing filter (AAF), averaging filter
	Pulse filter	Glitch filter for suppression of false pulses
	Event calculation	Derivation of events from the zero pulse
Data format	IEEE float	Output formats for rotational speed, velocity, PWM
	Taring	Software-based zero point correction for torque measurement shafts
	Scaling	Adjustment of output variables (e.g., torque, event variables)
	Derived channels	Calculation of additional variables such as displacement, speed, PWM/period
Special features	PWM detection	PWM evaluation similar to imc CANSAS
	Missing tooth detection	Detection of missing pulses
	Angle calculation (SUM)	Incremental angle determination by pulse summation
	Time offset measurement	Time difference between X_POS and Y_POS in two-signal mode
	Gated Counting	Counting only when gate signal is active (Y track)



Newly structured input dialogs: Counter



Newly structured input dialogs: Range & Scaling

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description																																														
CAN-FD	The ARGFT/CAN-FD module now supports the J1939 protocol, enabling extended communication in accordance with requirements.																																														
imc Online/Inline FAMOS function reference	imc ARGUS devices now additionally support the following functions: <table> <tr> <th colspan="2">Events and Filter</th></tr> <tr> <td>DelayLine</td><td>The data stream is delayed by the specified time.</td></tr> <tr> <td>GearRatio</td><td>A gear system's transmission ratio is calculated on the basis of the engine rpm and the live axle rpm.</td></tr> <tr> <td>SamplesGate</td><td>The input channel's values are only transferred, if the current value of the control channel is equal to the reference value.</td></tr> <tr> <th colspan="2">Filter</th></tr> <tr> <td>ReplaceFirstValue0 ReplaceFirstValueN</td><td>Replaces signal values with the value 0.0: During the phase of signal transients due to filtering at the measurement's start, the initial signal values are replaced with 0.0.</td></tr> <tr> <td>SkipFirstValues</td><td>Skip signal values: During the filter's transients phase at the measurement's start, the initial signal values are skipped.</td></tr> <tr> <th colspan="2">Intervall</th></tr> <tr> <td>IntervalBitAnd</td><td>Bitwise AND connection in interval: Determines the bitwise AND disjunction within the specified interval.</td></tr> <tr> <td>IntervalBitOr</td><td>Bitwise OR connection in interval: Determines the bitwise OR disjunction within the specified interval.</td></tr> <tr> <td>IntervalFrom1Level</td><td>Generates a channel specifying whether the signal's values are within a specified interval.</td></tr> <tr> <td>IntervalFromLevels</td><td>Generates a channel stating whether the signal's values are located within the specified interval.</td></tr> <tr> <td>IntervalFromPulse</td><td>Creates an interval channel from a incremental encoder signal.</td></tr> <tr> <td>IntervalLength</td><td>Length of one interval: Determines the length for the specified interval.</td></tr> <tr> <td>IntervalMax</td><td>Determines the input signal's maximum within the specified interval.</td></tr> <tr> <td>IntervalMean</td><td>Determines the mean of the input signal within the given interval.</td></tr> <tr> <td>IntervalMin</td><td>Determines the input signal's minimum value within the specified interval.</td></tr> <tr> <td>IntervalMult</td><td>Pulse count multiplier: From the input interval channel, generates a new interval channel with multiple pulse count.</td></tr> <tr> <td>IntervalResample</td><td>Resampling of a periodic signal</td></tr> <tr> <td>IntervalRMS</td><td>Determines the root mean square of the input signal within the specified interval.</td></tr> <tr> <td>IntervalStDev</td><td>Standard deviation within interval: Determines the standard deviation of the input signal within the specified interval.</td></tr> <tr> <th colspan="2">Scaling</th></tr> <tr> <td>RpmFromEncoder</td><td>Rpm from encoder signal: Determines Rpm signal from encoder signal</td></tr> </table>	Events and Filter		DelayLine	The data stream is delayed by the specified time.	GearRatio	A gear system's transmission ratio is calculated on the basis of the engine rpm and the live axle rpm.	SamplesGate	The input channel's values are only transferred, if the current value of the control channel is equal to the reference value.	Filter		ReplaceFirstValue0 ReplaceFirstValueN	Replaces signal values with the value 0.0: During the phase of signal transients due to filtering at the measurement's start, the initial signal values are replaced with 0.0.	SkipFirstValues	Skip signal values: During the filter's transients phase at the measurement's start, the initial signal values are skipped.	Intervall		IntervalBitAnd	Bitwise AND connection in interval: Determines the bitwise AND disjunction within the specified interval.	IntervalBitOr	Bitwise OR connection in interval: Determines the bitwise OR disjunction within the specified interval.	IntervalFrom1Level	Generates a channel specifying whether the signal's values are within a specified interval.	IntervalFromLevels	Generates a channel stating whether the signal's values are located within the specified interval.	IntervalFromPulse	Creates an interval channel from a incremental encoder signal.	IntervalLength	Length of one interval: Determines the length for the specified interval.	IntervalMax	Determines the input signal's maximum within the specified interval.	IntervalMean	Determines the mean of the input signal within the given interval.	IntervalMin	Determines the input signal's minimum value within the specified interval.	IntervalMult	Pulse count multiplier: From the input interval channel, generates a new interval channel with multiple pulse count.	IntervalResample	Resampling of a periodic signal	IntervalRMS	Determines the root mean square of the input signal within the specified interval.	IntervalStDev	Standard deviation within interval: Determines the standard deviation of the input signal within the specified interval.	Scaling		RpmFromEncoder	Rpm from encoder signal: Determines Rpm signal from encoder signal
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RpmFromEncoder	Rpm from encoder signal: Determines Rpm signal from encoder signal																																														

Area	Description
Statistics	
AccuLength	Count of samples over the entire measurement
AccuMax	Maximum value of entire measurement
AccuMean	Mean value over entire measurement
AccuMin	Minimum value of entire measurement
AccuRMS	RMS-value over the entire measurement
AccuStDev	Standard deviation over the entire measurement
Vectors	
VectorizeAndSkip	Create vector series: groups input samples into a series of vectors
VectorizeOverlapped	Creates an overlapping sequence of vectors from the input channel
Compare	
CodeRange	Returns specifiable values in response to a signal's value falling inside certain ranges.

1.5 imc STUDIO 2025 R2

1.5.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- Firmware imc DEVICES 2.18 R2
- [Firmware imc DEVICEcore 3.8 R2](#) 

1.5.1.2 Firmware imc DEVICEcore 3.8 R2

Hardware

ARGFT-BASE with WiFi

- **Flexibility and mobility:** An ARGFT system with an ARGFT-BASE WLAN base unit can be used in different locations without the need for a physical connection. This is particularly useful in large or hard-to-reach areas.
- **Easy integration:** WLAN-enabled devices can be easily integrated into existing networks and systems, simplifying implementation and operation.

The current list of approved regions can be found in the data sheet for the base unit.



imc ARGUSfit Base Unit with WiFi

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

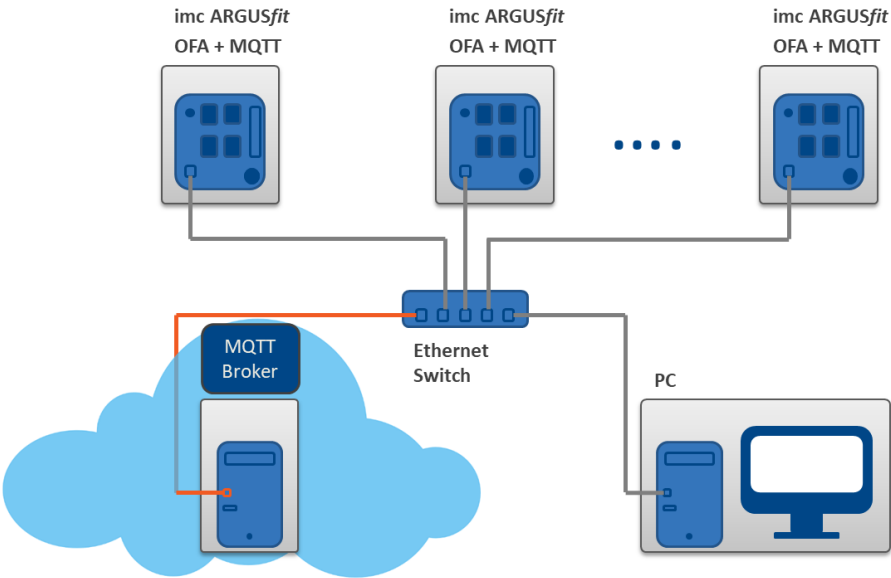
Area	Description
CAN-FD	The default name of the protocol channel now also contains the protocol suffix "CAN" and the module serial number, e.g. "CAN_Protocol_channel_4350094_1". There is no longer a status line, errors are displayed in a message box after the check. Various content corrections and improvements have been made to the description in the manual.

1.5.2 imc ARGUSfit connection to cloud dashboards



New imc Online FAMOS functions for MQTT

MQTT (Message Queuing Telemetry Transport) is a messaging protocol. It was developed for networks with low bandwidth and IoT (Internet of Things) devices. MQTT is based on a client-server architecture. An MQTT client (for example, a sensor or a device) establishes a connection to an MQTT broker. The broker is the server that receives and forwards messages. This is not provided by imc.



1.5.3 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Sequencer	System requirements NumPy 64 bit: support of NumPy 2.2 and 2.3 System requirements Python 64 bit: support of Python 3.13

1.6 imc STUDIO 2025 R1

1.6.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.18 R1](#)²³
- [Firmware imc DEVICEcore 3.8 R1](#)²⁴

1.6.1.1 Firmware imc DEVICES 2.18 R1

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Access to IP address of a measurement device	A GetDeviceIP script for obtaining the IP for devices in firmware group A is available on request, see device overview ²⁷⁷ . This functionality is available in the imc API (imc STUDIO API/Application Interface).

1.6.1.2 Firmware imc DEVICEcore 3.8 R1

Hardware

16-channel digital input module

The DI-16, belonging to the imc ARGUSfit-series, enables the capture of up to 16 digital input signals at a maximum sampling rate of 100 kHz. The capture of digital signals can be performed either bitwise or as data words for all inputs.



imc ARGUSfit-DI-16

imc ARGUSfit-DI-16 - at a glance

- Voltage mode, level configurable: TTL or 24 V level
- Switch mode, external switch, directly connect external switch
- Monitoring and acquisition of switch device status
- Industrial applications with 24 V logic level signal
- Monitoring with digital status signal acquisition
- Robust, compact and miniaturized: click mechanism for imc ARGUSfit system
- Galvanic isolation for 8 groups of 2 bits

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
CAN-FD	Deleting messages or channels was not possible in multi-selection. Now all selected messages or channels can be deleted.
	The imc CAN bus assistant (firmware group B) now also supports digital bits that can be used for communication between control units.

1.6.2 imc Inline FAMOS



Inline analysis functions

Previously, inline analysis calculations were carried out in only one IFA task and so only one CPU core.

In order to increase performance, inline analysis calculations are now split fully automatically across several processor cores.

1.6.3 Meta data



Display meta data

The measurement meta data of completed measurements can be loaded via the data browser and displayed on a report page, for example.

1.6.4 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
General	In the past, the "Experiment has changed" dialogue often appeared even if no change had been made. This behaviour has been significantly improved so that the dialogue now almost only appears when actual changes have been made.
Setup pages	The alternating colors in the channel table are now more clearly visible.
Setup - Pages Configuring channels and variables	The setting parameters via the " Range & Scaling " dialogue, unit mV/V of the unscaled input range, i.e. the electrical measuring range, is now correctly displayed.
Remote desktop access	imc STUDIO can be automatically minimized when the Remote Desktop connection is disconnected to avoid graphics errors (PresentationCore WPF render thread). This setting is activated under " <i>Options</i> ": " <i>Remote desktop</i> ", " <i>General options</i> ".

2 imc STUDIO 2024

2.1 Introduction

Developments in imc STUDIO 2024 focused on various aspects. On the following pages, you will find an exact enumeration and description of the changes.

The imc team wishes you total success in accomplishing your measurement tasks with imc STUDIO.

2.2 imc STUDIO 2024 R4

2.2.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- Firmware imc DEVICES 2.17 R4
- [Firmware imc DEVICEcore 3.7 R4](#) 

2.2.1.2 Firmware imc DEVICEcore 3.7 R4

Hardware

10-channel measuring amplifier for temperature measurement with thermocouples

The T-10 module out of the imc ARGUS*fit* series is a 10-channel measuring amplifier that can measure temperatures with thermocouples of all common types. It is used in conjunction with an imc ARGUS system (or a base unit), to which it is docked directly with its housing.



imc ARGUSfit-T-10

imc ARGUSfit-T-10 - at a glance

- Per-channel isolated measurement inputs, individual filtering and ADCs
- Individual cold junction compensation (CJC) per channel
- Measurement ranges and sampling rates individually selectable
- 24-bit digitization, internal processing and data output
- Robust, compact and miniaturized: click mechanism for imc ARGUS*fit* systems

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

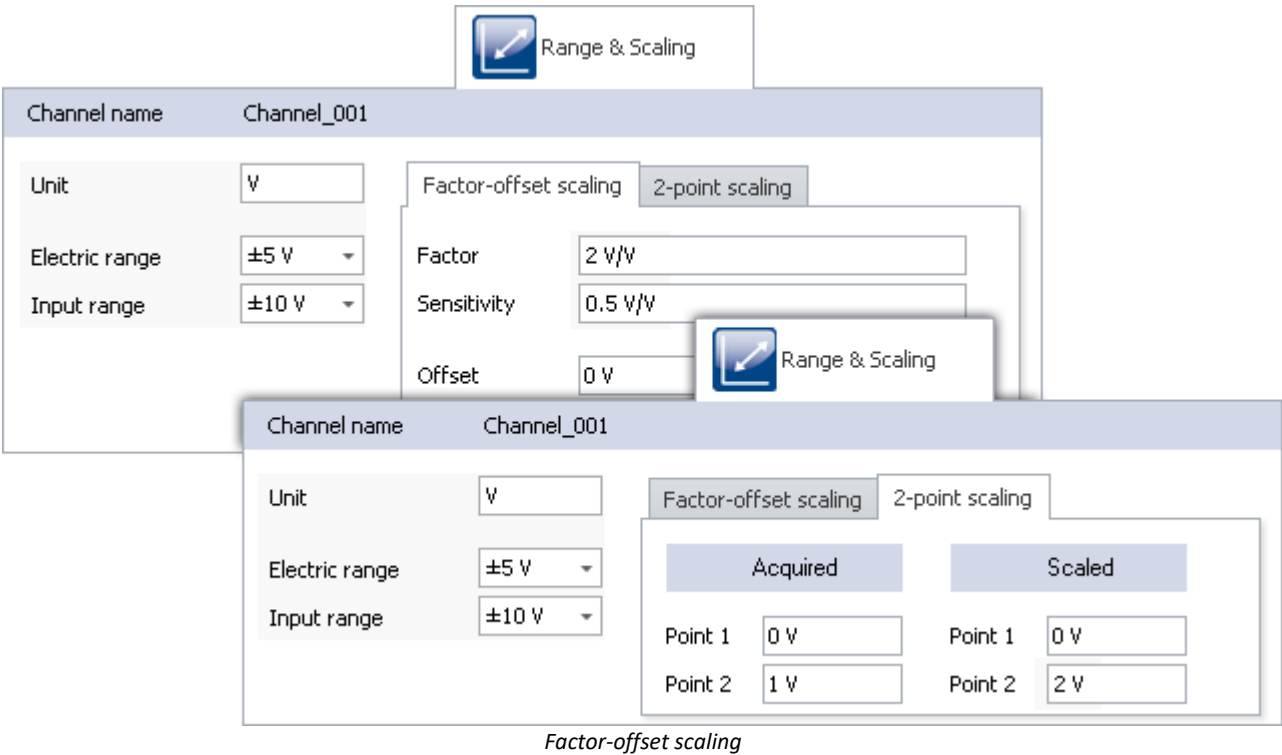
Area	Description
CAN-FD	When multiple selection was activated, neither the scaling nor the error handling could be opened. Now, with multiple channel selection, both the scaling and the error handling of these channels can be opened.

2.2.2 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Sequencer	System requirements NumPy 64-bit: support of NumPy 2.0.0 and 2.1.1
Setup - Device (general)	Offline use of imc STUDIO Monitor was not possible.

Area	Description
Setup - Pages Configuring channels and variables	The setting parameters via the "Range & Scaling" dialogue have been expanded. In addition to the calculated measuring range, the "non-calculated" measuring range, i.e. the electrical measuring range, is now also displayed in this dialogue.



2.3 imc STUDIO 2024 R3

2.3.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- Firmware imc DEVICES 2.17 R3
- Firmware imc DEVICEcore 3.7 R3

2.3.2 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
CAN-bus assistant (firmware group B)	The assistant supports multiple selection.

2.4 imc STUDIO 2024 R2

2.4.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

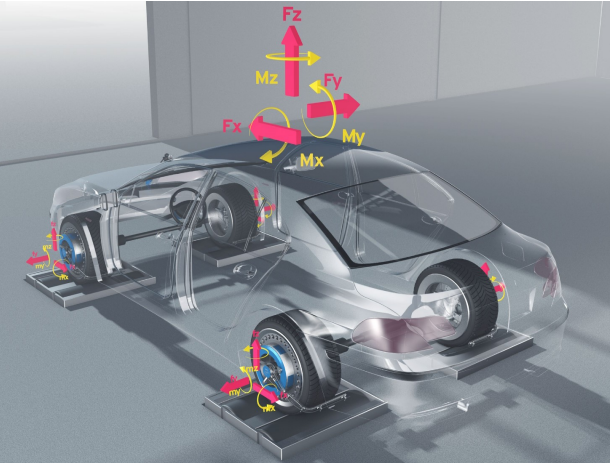
- Firmware imc DEVICES 2.17 R2
- Firmware imc DEVICEcore 3.7 R2

2.4.2 Setup and device control

imc WFT Assistant

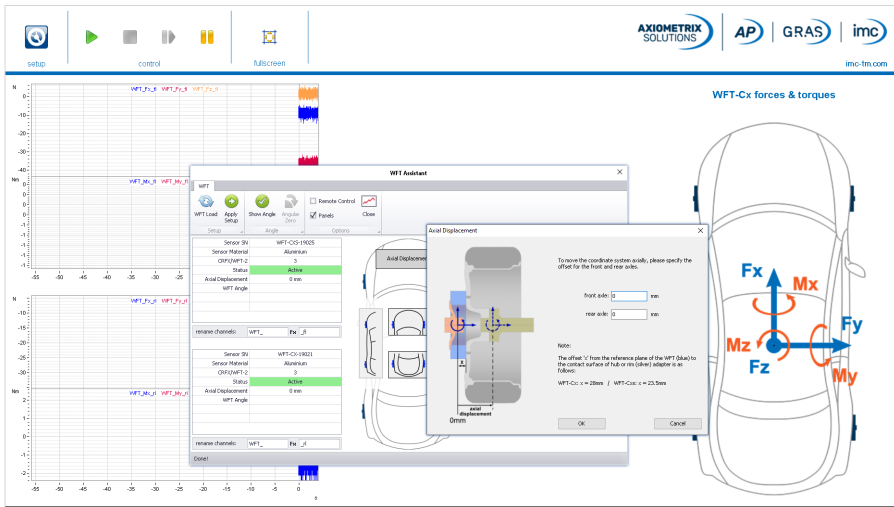


Configuration and usage of 6-component wheel force transducers



Forces and moments in the vehicle coordinate system

The WFT plug-in provides a user-friendly Assistant for configuring the 6-component WFTs, as well as pre-made Panel-pages for optimized display of measured results.



Sample Panel-page and Assistant interface

2.4.3 imc Inline FAMOS



Target sampling interval instead of a reduction factor

Optional parameters as in imc Online FAMOS have been provided to the following functions: Red, Max, Min, Mean, RMS, StDev, NumberOfPulses, HighLowRatio, Sum, Sum2, ExpoRMS, PulseDuration, PulseFrequency, PulsePhase, LEQ and ABCRating.

Instead of specifying a reduction factor, it is possible to specify a target sampling interval. This must be an interval which would result from a permissible integer reduction factor.

Predefined constants

Predefined constants can now be used in imc Inline FAMOS.

Constants	Description
e	Euler number e
InDegr	constant for converting radians to degrees
InRad	constant for converting degrees to radians
PI	circle constant PI
PI2	2 * circle constant PI

2.4.4 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Metadata	The measurement metadata is no longer automatically reset each time a measurement is started.
Operating system components	The following component is supported: Microsoft VC 2015-2022 14.36.32532 Microsoft Visual C++ Redistributable\2022
ME'scope	The ME'scope software has been extended for imc hardware. It is now possible to use ME'scope as a front end for imc ARGUSfit.
Panel page	Buttons for scrolling forwards and backwards are now available in the widget shelf.
VRTC accuracy option	VRTC - Virtual clock on the PC The minimum accuracy is now managed across all devices and applies to all imc devices. The " <i>minimum accuracy</i> " option can now be found under: "Extra" ribbon > "Options" in the region: "Setup" > "General options" > "Virtual device clock" Until now, the option was located as follows: "Extra" ribbon > "Options" in the region: "Setup" > "Device options" > "Virtual device clock"

2.5 imc STUDIO 2024 R1

2.5.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.17 R1](#) 
- [Firmware imc DEVICEcore 3.7 R1](#) 

2.5.1.1 Firmware imc DEVICES 2.17 R1

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
imc Online FAMOS	The icons within the imc Online FAMOS editor have been updated. They now correspond with the new design of imc DEVICEcore.
imc PROFIBUS Configurator	The installer for the imc PROFIBUS configurator can be executed again.

2.5.1.2 Firmware imc DEVICEcore 3.7 R1

Hardware

4-channel measurement module for strain gauge, bridge mode and voltage

The B-4 module belonging to the imc ARGUSfit series is a 4-channel measurement amplifier. It can be used in conjunction with an imc ARGUSfit system and is directly docked with its housing.

Individually isolated, configurable differential channels capturing:

- Strain gauges, bridge-mode sensors and potentiometers
- Voltages (25 mV to 10 V)
- Active transducers that require voltage supply



imc ARGUSfit-B-4

imc ARGUSfit-B-4 - at a glance

- Per-channel isolated measurement inputs, individual filtering and ADCs
- Software selectable quarter-bridge completion with 120 Ω, 350 Ω und 1 kΩ
- Bridge and sensor supply, channel-wise individually configurable
- Bridge mode excitation from 5 V down to 0.5 V
- Sensor supply of voltage-fed transducers up to +15 V
- 40 kHz bandwidth at max. 100 kSps/channel sampling rate
- Graphical configuration wizard to setup strain gauge modes
- Measurement ranges and sampling rates individually selectable (in steps of 1, 2, 5)
- 24-bit digitization, internal processing and data output
- Robust, compact and miniaturized: click mechanism for imc ARGUSfit systems

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

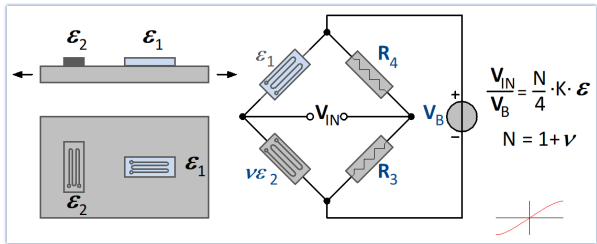
Area	Description
Firmware	If the firmware update was successful, the dialog closes automatically after a few seconds.
CAN-FD	• Scaling offset: For configuration of Integer-variables, it is now possible to enter negative offset values. • The message ID can now be entered as a hex number with the suffix "h", e.g. "7FFh". The assistant then displays the converted decimal value. The input in the form of 0x7ff is not supported. • imc ARGUSfit CAN-FD always sent 8 bytes in classic CAN mode. Now the configured amount of data bytes is sent correctly. • The plausibility check now recognizes invalid names with forbidden special characters.

2.5.2 Setup and device control

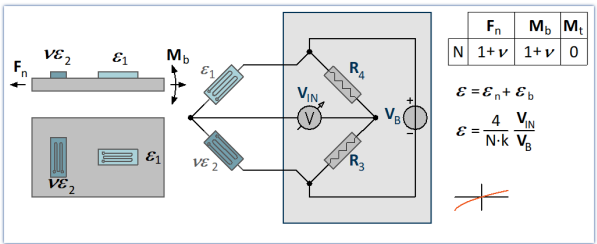


The strain gauge measurement modes have been updated

The descriptions and illustrations have been revised. The illustrations now show, among other things, what is present in the device and what must be connected externally to the plug.



Old graphic for the Poisson half bridge



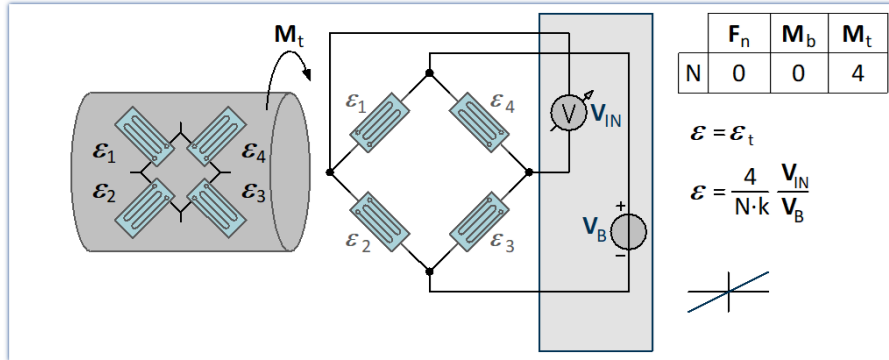
New graphic for the Poisson half bridge



New strain gauge measurement modes for the new amplifier "ARGFT/B-4"

Full bridge - torsion measurement

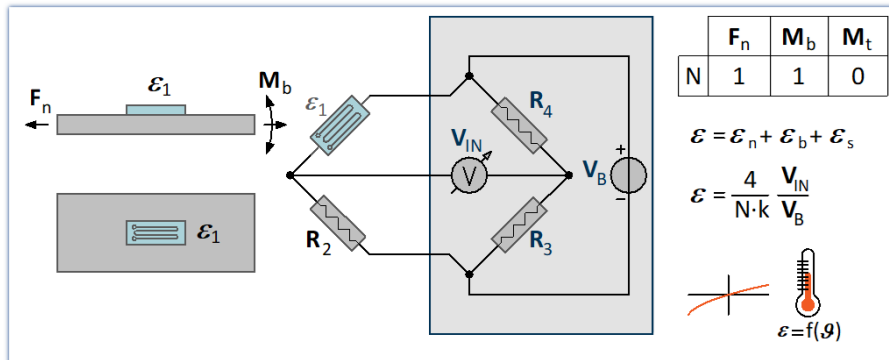
This bridge circuit uses a full bridge with four active strain gauges, each applied at an angle of 45° to the main axis of the structure. This circuit results in a high sensitivity with good compensation of the temperature influence. It is insensitive to tension or pressure, bending and temperature changes.



Full bridge - torsion measurement

Quarter bridge with external completion resistor

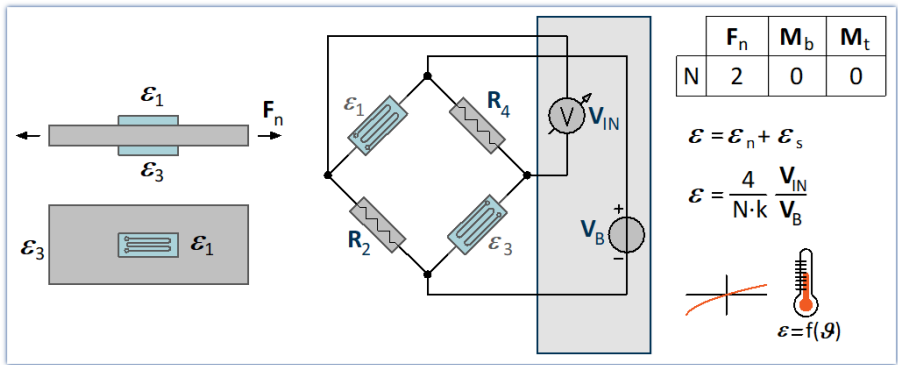
This bridge circuit uses an active strain gauge and an external completion resistor for strain measurement of tension, compression or bending. The strain gauge is located in the uniaxial stress field on the measurement object. This strain gauge is supplemented by two passive resistors in the module (internal supplementary resistors) to form a full bridge.



Quarter bridge with external completion resistor

Diagonal bridge with two strain gauges in uniaxial direction

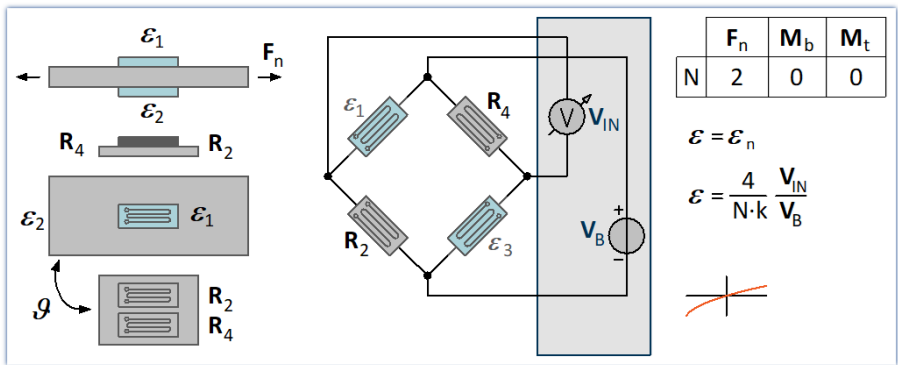
This bridge circuit uses two active strain gauges on diagonally opposite sides of the structure to measure strain in tension and compression respectively.



Diagonal bridge with two strain gauges in uniaxial direction

Diagonal bridge - temperature compensated

This bridge circuit uses two active strain gauges that are diagonally connected and located on diagonally opposite sides of the structure to measure strain in tension or compression. They are complemented by 2 passive strain gauges, which are mounted on a component made of the same material and at the same temperature to compensate for the influence of temperature.



Diagonal bridge - temperature compensated

2.5.3 imc Online FAMOS



Target sampling interval instead of a reduction factor

The LEQ and ABCRating functions have been provided with an optional additional parameter.

Instead of specifying a reduction factor, it is possible to specify a target sampling interval. This must be an interval which would result from a permissible integer reduction factor.

Predefined constants

Predefined constants can now be used in imc Online FAMOS.

Constants	Description
e	Euler number e
InDegr	constant for converting radians to degrees
InRad	constant for converting degrees to radians
PI	circle constant PI
PI2	2 * circle constant PI

2.5.4 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Device control	- Name conflicts between devices of different firmware groups are now handled correctly and the measurement can be started correctly once they have been resolved. - Reconnection to the current measurement is only possible with imc devices. This no longer results in error messages for third-party devices. Third-party devices can be started individually after reconnection. - Improvement in the presentation of the trigger page: The table automatically adjusts to the window width so that longer channel names are better displayed. - Improvements in the 4K display The combined columns in the device configuration tables (Setup) are now displayed correctly. Previously, the columns overlapped.
Data Browser	The expansion behavior in the Data Browser has been improved so that access to the variables is possible in most cases without many actions. "Analog channels" in "Current Measurement" is expanded from the start. - When searching by name, everything that contains the search result is automatically expanded.
Metadata	- The metadata of the DI bits were not saved in the measurement file. The metadata are now saved correctly. The metadata of the ports are an exception. These are not saved in the measurement file. Reason: The port is not saved as a separate file, only the bits. - Drop-down list in Data Browser for metadata columns offers new channel metadata directly. Previously, a restart was required.
Automation	- It is possible to copy or delete several variables at the same time using multiple selection. In this way, several variables can easily be added. - The variable type "Static vector" was limited to 100 values. This limit has now been increased to 100,000 values.

Area	Description
Variables	If the value of a variable was changed on the PC and immediately afterwards on the device via imc Online FAMOS , it could happen that the value change on the device did not arrive on the PC. The displayed value on a widget therefore differed from the actual value on the device.
Transfer to imc FAMOS	During the transfer to imc FAMOS of time-stamped data, there was a crash of imc STUDIO.
Python command	The error behavior has been improved. • If "<i>imcVariables</i>" is specified as an input or output variable, the command returns an error and aborts. • In the case of an error, the line of the Python script in the sequencer is colored orange (warning) or red (error). As before, the error message appears in the logbook. • If a variable cannot be transferred to Python or from Python to imc STUDIO, the variable name is also displayed in the error message.
Project management	The export of experiments and projects larger than 2 GB was not working properly.
Licensing	imc STUDIO occupied a imc API network license in some cases.
Installation medium	The installation medium now contains imc FAMOS 2024 R1* and the corresponding curve manager (imc Shared Components). *must be purchased and licensed separately for the PC

3 imc STUDIO 2023

3.1 Introduction

Developments in imc STUDIO 2023 focused on various aspects.

- In order to make introduction to the system easier, various changes and enhancements have been implemented. Among others, there is now an assistant for guiding the user through the first steps.
- The display-Widgets automatically adjust to the scale range.
- Various performance problems have been resolved.
- Advances have been made in implementing the GoPro camera.
- The new imc *DEVICEcore* device series imc ARGUS*fit* is supported.

On the following pages, you will find an exact enumeration and description of the changes.

In particular, you should read the chapter "[Update-notes and compatibility](#)" before performing the update. It presents all the functional changes and modifications which need to be observed when updating.

The imc team wishes you total success in accomplishing your measurement tasks with imc STUDIO.

3.2 imc STUDIO 2023 R6

3.2.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.16 R6](#)
- [Firmware imc DEVICEcore 3.6 R6](#)

3.2.1.1 Firmware imc DEVICES 2.16 R6

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Miscellaneous	In the version 2023 R5, numerous bugs appeared which had already been fixed in the predecessor versions. The AddOn dated to 19.01.2024 of Version 2023 R5 has fixed these. These problems are no longer present in the current Version 2023 R6 either.

3.2.1.2 Firmware imc DEVICEScore 3.6 R6



Diskstart / Autostart

imc EOS and imc ARGUSfit now support automated measurement start after power-on.



GPS-channels without synchronization

The GPS-channels of an imc ARGUSfit device are now displayed even when no GPS-synchronization is used.

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Balancing	- Taring was not performed when either "Current" or "Resistance" was selected as the measurement mode. - Taring caused measurement to start if a measurement had previously been performed. - When changes to the device configuration are made during measurement, taring during measurement is no longer possible.
Measurement	Measurement start of individual channels did not always occur at the relative time reference point X0=0, but sometimes one sample later. The discrepancies occurred when differing sampling rates, especially slow ones (< 100 Hz) were used.
Data saving	When saving a fixed number of measurement points, 1 sample too many was captured.
Trigger	- Factor-offset-scaling: When the scaling factor was negative, the channel could not be used as the trigger source. - Channels on which measurement was stopped by a trigger always had two measurement samples after the stopping event. This means one sample too many. Now stopping occurs correctly after the next sample. - When an event occurs before the start of the first measurement, it is ignored if it is no longer in effect. Event monitoring now only begins upon start of the first measurement and no longer directly after preparation of the device. Thus, any events which are no longer prevalent before the first measurement no longer cause data recording to start. Previously, this could happen in the following case: For instance, a threshold violation was detected before the start, then afterward, the measured values are located within the hysteresis band but have not yet fallen below it. This change only applies to the time before the first measurement. For subsequent measurements, the previous behavior is still applicable.

Area	Description
CAN-FD	- A variety of improvements of the dialog guidance and of the input options have been made. - Optimization of the use of multiple CAN-FD modules: The default name of a log channel is now unique because it includes the device's serial number and its node number. - Termination: The software-activated termination now works even when no message at the node is configured. - Data in the Motorola format were not sent/received correctly. - In Version 2023 R5 a crash could occur when the CAN Assistant was used with the English GUI. Scaling factor - A valid scaling factor between 0 and 1 was identified as invalid. - For configuration of Integer-variables, it is now possible to enter negative scaling factors. DBC import - DBC-import: The Baud rate from the file was not applied. - Units having special characters such as °C, µm, ... are now imported correctly. - Channels having the formats Signed and Unsigned Integer had been imported as Real numbers. - Some DBC files had previously not been imported.
Setup	The columns "Manufacturer" and "Device-Firmware" were empty for devices of the firmware-group B.
Hardware	CANFT/T-10-T The measurement mode of CANFT/T-10-T channels was set by default to "Type K". However only "Type T" is possible. The default setting has been corrected.
Connection	When connection with an imc DEVICEcore device could not be established because there was an active connection to a different PC, no message appeared in the logbook.
imc Online FAMOS	- The scaling functions RangeMin/RangeMax always returned 0. - The handling of Japanese characters has been improved.
Data sharing	Sharing values among the devices: imc ARGUSfit devices could send values to the Display-variables of imc devices belonging to firmware group A (e.g. imc CRONOS, imc C-SERIES, ...). Previously, this was only possible for the channel type "Analog inputs". Now the values of other channel types can also be transmitted: including Monitor channels, Fieldbus channels (CAN), virtual (equidistant) channels from imc Online FAMOS.

3.2.2 imc Online FAMOS



Target sampling interval instead of a reduction factor

Certain functions which have a reduction factor as a parameter have been provided with an optional additional parameter.

Instead of specifying a reduction factor, it is possible to specify a target sampling interval. This must be an interval which would result from a permissible integer reduction factor.

Implemented for the following functions: Red, Max, Min, Mean, RMS, StDev, NumberOfPulses, HighLowRatio, Sum, Sum2, ExpoRMS, PulseDuration, PulseFrequency, PulsePhase

3.2.3 Metadata



Comments on the measurement (Metadata)

By using the Comment-function, it is possible to save explanatory information along with the measurement.

The metadata are saved in parallel with the saved measurement data in the same measurement folder. By default, a multi-line comment box is available for this purpose. Additional metadata (texts, numbers) can be added.

Display of the metadata in a dialog can be specified to occur either before or following the measurement. Optionally, the data can be made available in the form of variables. This makes it also possible to display the data on a Panel page, on which the values can also be edited.

The file's format is the user's choice between a text file and imc-format.

Name	Value
SN	123456
Info1	
Info2	

Example of entering metadata on a measurement

Notes on compatibility:

This replaces the Metadata-Assistant in imc STUDIO 5.2.



Saving metadata to the channel (device)

For devices of firmware group A: The channel-metadata are now saved with the channels also when saving to the device.

Display of metadata

Data Browser: The metadata saved with the channel can now again be inserted as a column in the Data Browser.

Placeholder: Using the placeholder "<VARS.PROPS>", metadata saved with the channel can be displayed again.

3.2.4 Exporting variables



Uniform export templates (*.aet) with imc FAMOS

The export templates of imc FAMOS and imc STUDIO have been grouped. Only one uniform storage location is used for the export templates. It is located at the location defined by imc FAMOS: "C:\ProgramData\imc\Common\Def"

The names have been standardized and the selection has been modified and limited. The ASCII export-templates are no longer offered.

Previously offered by imc STUDIO	New choice
ASCII-Exportvorlage (.asc)	---
ASCII-template_commonScaling (.asc)	---
ASCII-Exportvorlage_gemeinsameSkalierung (.asc)	---
Combined scaling (.csv)	CSV, common scaling
Separated scaling (.csv)	CSV, individual scaling
XLS-Exportvorlage (.xls)	XLSX, individual scaling
XLS-template_commonScaling (.xls)	XLSX, common scaling
XLS-Exportvorlage_gemeinsameSkalierung (.xls)	XLSX, common scaling

The export format has been revised in order to match the international standard:

- The CSV-format uses the period dot as the decimal separator and the comma as the column separator.
- The Excel-templates use XLSX as the default format.

Note: With the help of imc FAMOS, you can create your own export format templates (*.aet) and use them in imc STUDIO. The use of one's own templates is also possible on other PCs. No imc FAMOS installation is required. For information on this topic, see the imc FAMOS user's manual.

Compatibility notes:

To ensure that existing experiments continue to be functional, the old export templates must be available in the new folder. Upon loading an experiment the system checks whether any templates are missing in the old path. If so, they are copied. Thus, no additional actions are initially necessary.

In this context, note the following:

- The available choices for the format are then both the new choices and the copied ones.
- The old ones do not exist on the PC.

When existing experiments are used on new PCs, export is not possible because the old aet-file does not exist there. A warning appears when the experiment is loaded. You can either make the old templates available on the new PC, or modify the export commands in the experiments to use the new templates.

Please ensure that subsequent programs are able to process the new format if the results files are to be used going forward.



Exporting variables in text format

The function "Export variables" now offers the ability to export variables as a txt-file. The file contains the variable's name and its current value.

In this way, even user-defined text variables can be exported.

3.2.5 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Metadata	The saving of channel metadata is now ensured. In some cases, they had not been saved once an experiment was loaded, if no changes were made.
IEPE-calibration	Reduction of choice of channels: The dialog for IEPE-calibration now has a clearer overview since the only channels offered are ones for which it makes sense to perform calibration. • The sampling rate must be greater than or equal to 1 kHz. • The channel type and coupling specified must match (e.g "AC", "DC", "IEPE",...).
Bus Decoder	Fieldbus-bits caused an error message in the Bus Decoder: "OBD_DataSink::CreateBusfilterSink(): m_pBusfilterSink != NULL Bus Decoder".
Automation	imc FAMOS Data cutting • When starting the measurement following changes to the Automation, the following error occasionally was returned: <i>"DataWriter-Fehler! <...> The file already exists. Code= 0"</i> This error now no longer appears since the data have been released correctly.
Placeholder VARS.PROPS	The list of available variable properties has been reduced. Only such properties are displayed which the variable actually possesses. If the variable doesn't exist, all properties are displayed.
Installation	When starting the version 2023 R5, in some cases the following error message was posted: <i>"Unable to read the application name from the Registry. ..."</i> . This error is fixed in the current version.
Silent-Installation	The ini-file for silent installation of imc DEVICEcore has been modified. The configuration entered in the ini-file was not used. Additionally, the name was not adapted.
readme	The Products list now also includes <i>"imc Shared Components"</i> along with their associated version numbers.

3.3 imc STUDIO 2023 R5

3.3.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.16 R5](#) 41
- [Firmware imc DEVICEcore 3.6 R5](#) 41

3.3.1.1 Firmware imc DEVICES 2.16 R5

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
imc REMOTE SecureAccess	imc REMOTE SecureAccess has been removed from the dialog "Device search via IP/DNS", as well as from the device properties. The obsolete TLS 1.0 technology is no longer used.

3.3.1.2 Firmware imc DEVICEcore 3.6 R5

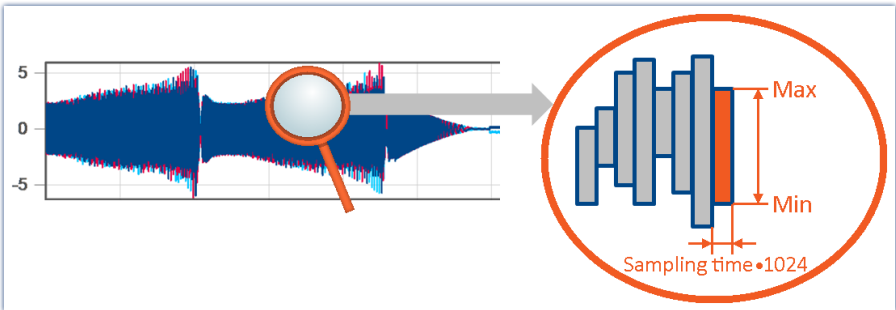


Envelope type monitor channel for imc ARGUSfit

imc ARGUSfit devices can now generate **reduced envelope type** monitor channels (min-/max-channel). The envelope ensures a complete overview of the measurement and smooth changing of the display even at a high data rate, without burdening the network with an excessive data rate.

The system cyclically condenses **x data points** down to **two new values**: the respective **minimum** and **maximum values** of the x points. The channel's data rate is thus reduced by a factor of $x/2$.

This reduced count of values is displayed as an envelope curve. With imc ARGUSfit monitor channels, the factor x can be freely specified in the "preprocessing".



Envelope type monitor channels
Example of reduction by 1024 points
Resulting reduction of the data rate: 512

Envelope type monitor channels are available on the Setup page: "Analog Inputs" under the channel type: "Monitor Channels". The "preprocessing" must be set to "Envelope".

Note

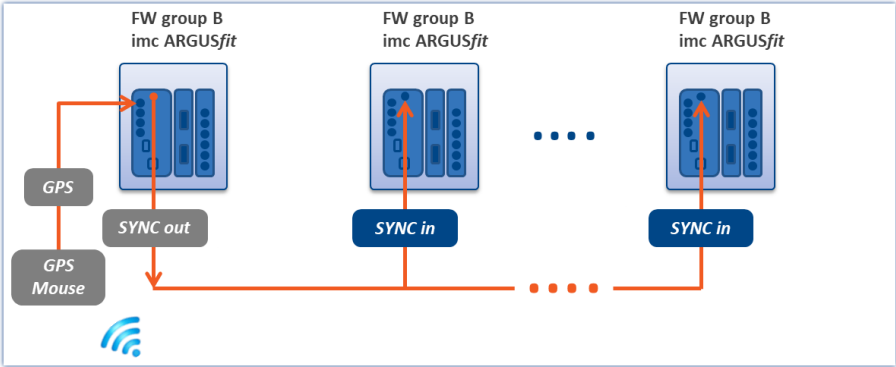
Signal processing

The envelope type monitor channels are not suitable for signal processing computations in, for example, imc Online FAMOS/imc Inline FAMOS!



GPS-synchronization with imc ARGUSfit

imc ARGUSfit devices can now be synchronized via GPS using a connected GPS-mouse. The GPS information is also available in the form of variables if GPS-synchronization is activated. This makes possible the recording of the position and of the GPS quality, among other things, during running measurement.



A device synchronized using GPS outputs the time via SYNC-Out / SYNC-In to other devices, so that all clocks are synchronized to each other.



First use of imc CANSASfit modules on the imc ARGUSfit

It must be ensured that the imc CANSASfit modules are operated with imc CANSAS Software Version 2.3 R1 or higher before use on the imc ARGUSfit.

To do this, the module must be updated with the imc CANSAS software via a USB-CAN interface (e.g. KVASER) or an imc CRONOS/BUSDAQ device.

This procedure is the minimum requirement for connecting these imc CANSASfit modules to an imc ARGUSfit device for the first time. When connected to the imc ARGUSfit, the imc CANSASfit module is updated with the appropriate firmware by imc STUDIO.

Background information:

All imc CANSASfit modules can be operated either connected directly to imc ARGUS, or via the imc CANSAS socket. In order for imc ARGUS to detect the modules, the Baud rate of all imc CANSASfit units must be set to 500 kBaud and the Master/Slave ID must be set to 2/3. As of imc CANSAS Version 2.3 R1, all imc CANSASfit modules are equipped with an automatic mechanism which detects that they are being run by an imc ARGUS unit. The modules then independently make the necessary interface settings.

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Device configuration	- The parameters "Filter characteristic" and "Filter Cut-off frequencies" are now hidden whenever they are not in use. In Some cases, "NONE" or "0 Hz" has previously been displayed. This now matches the behavior of the devices belonging to firmware group A. - When changing the temperature unit from °C to °F, the conversion was applied to channels which were not set to measure temperature. - The respective selection for a temperature measurement, e.g. "PT100", "Type K" ... now appears in the column "Measurement mode".

Area	Description
Fieldbus channels	- By means of the Channels table, it was possible to set fieldbus channels to passive (parameter: "Status") but without effect. Now the "Status" is no longer editable for fieldbus channels. - It was not possible to set the measurement duration of CAN channels on the Setup page
Level indicator displays	The level indicator displays (Widget and Channel table) only worked when the metadata were also saved with the channel. Now, the necessary parameters for the overload range are again always included in the transfer.
imc Online FAMOS	From the second device onward, the name of the event-channel in imc Online FAMOS is supplemented with the device's name.
imc ARGUS Base LEDs	The Status- and Storage-LEDs have been modified. The color codes are stated in the imc ARGUS <i>fit</i> manual.
imc EOS	The channel name of an imc EOS device was supplemented with an internal number.

3.3.2 Inline Analysis - imc WAVE Noise



Sound pressure level under range

Fall of the calculated sound pressure level under range as per the standard: "*DIN_EN_61672*".

In order to determine the level linearity according to the standard, it is important that the under range is observed and evaluated taking into account the measuring range of the input channels. For this purpose, a supplemental variable, "*WAVE_UnderrangeVariable*", is available (in parallel) for all existing sound level calculations in a measurement. This variable indicates that a calculated sound pressure level reports under range, but not which calculation.

If an under range is detected, the variable "*WAVE_UnderrangeVariable*" is set to "1" at least for one second. After elapse of that one second, the system checks whether any calculation of sound pressure level is still reporting under range.

- If "no", the variable is set back to "0".
- If "yes", the value "1" is retained until the level is no longer under range. Then the variable is set back to "0".

Only such sound pressure level calculations are monitored for under range whose input channels originate from devices belonging to firmware groups A or B (imc DEVICES and imc DEVICEcore).

Sound pressure level calculations whose input channels have no measurement range such as 3rd-party device channels are not monitored.

3.3.3 Metadata



Saving metadata with the channel - Balancing information

Balancing information can now also be saved with the channel as metadata. The new choice "*Balance information*" via the option "*Setup*" > "*Traceability of data*".

3.3.4 Logbuch



New function: Export logbook-files

Logbook files are frequently needed by our technical support for error analysis purposes. In response to this button, all existing logbook files are zipped. They can then be sent to our technical support.

3.3.5 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Device configuration - Trigger	Channels having long names would usually appear on the Setup page "Trigger" with an abbreviated name due to insufficient room. For this reason it wasn't possible to distinguish between names if the beginning of multiple channel names was the same. The available room is limited. Thus display of the name was modified. If the name doesn't fit in the cell, the beginning and end of the channel's name are shown. The middle part of the name is replaced with dots.
Device configuration - Parameterset import	• New mapping: "<i>Uniformly per module type</i>" Set up all channels of a module type uniformly. The assignment is based on module type and channel type (e.g. "ARGFT/UTI-6-SUP", "Analog inputs"). • The mappings have been renamed: • "<i>Import of channels according to connector and device serial number</i>" → "<i>Multiple-device operation (Firmware group A)</i>" • "<i>Import of channels according to connector</i>" → "<i>Single-device operation (Firmware group A)</i>"
Connection to the device	Re-connecting to a running measurement • If the pertinent experiment is not found on the PC when re-connecting, the connection procedure is canceled and an error message is posted. Previously in such cases, a prompt appeared to select among various files. • If the project management is deactivated (no database used), the connection can now also be re-established on other PCs on this condition: the experiment and the *.data folder are located on the same path in the PC as the one from which the measurement was started.
3rd-party device "fos4X"	The channels of an fos4X 3rd-party device do not stop once a defined measurement duration has elapsed. For this reason, it is no longer possible to set a measurement duration for these channels.
Data storage on the PC	An error message was posted when the measurement channel data surpassed 2 GB. Now it is again possible to save volumes of measured data greater than 2 GB to the PC.
imc Online/Inline FAMOS	Function "StDev" • If a channel's measurement values fluctuated only within the LSB and thus was not constantly 0, a very small rounding error appeared in the summation of the values. In some cases, this caused a negative number to appear within a square root and to be incalculable in consequence. The replacement value outputted was 1e100.
Automation	• The action "<i>Prepare</i>" for a device with complex automation tasks required very much time and has now been made much faster. • The result of the Data-cutting function was delayed by multiple seconds when slowly sampled channels were cut. The delay became longer as the sampling rate became lower. Now there is no delay in consequence of cutting even with slowly sampled channels.
Panel	Changes to the option: " <i>Multi-lingual text input</i> " were not saved. Now, the option is deactivated by default and can be activated as needed.

Area	Description
Widgets	Graphical switch - The graphical switch caused permanent burdening of the CPU. - The option "<i>Zoom factor</i>" in the Widget "Graphical switch" was interpreted incorrectly in some regional formats. "0.7" was interpreted as "7". Table - Any table on a page which is not open was not displayed upon export of a multi-page PDF-file. Standard > Switch (Checkbox) - If the property "<i>Operable</i>" is attached to a variable, the Widget was operable once the experiment had been loaded, even if the variable's value was "0". Now this property is applied correctly upon loading.
Sequencer	Command "Execute unmanaged DLL" When executing the command "<i>Execute unmanaged DLL</i>", an <code>UnhandledException</code> "Constructor not found" occurred.
Starter-exe	The exe-file of any program (imc STUDIO, imc WAVE, imc STUDIO Monitor) is now located in the respective installation folder and no longer in the folder "<i>ProgramData</i>". Furthermore, the file is provided with a signature. Info on compatibility: Start the imc STUDIO by a shortcut or via the command line, correct the path to the exe-file if appropriate. - old: "C:\ProgramData\imc\imc STUDIO\Applications_1\imc STUDIO.exe" "imcDB://DB\StandardProject\MyExperiment" - new: "C:\Program Files\imc\imc STUDIO 2023\imc.Studio.exe" "imcDB://DB\StandardProject\MyExperiment"
Scripting	Newly created event-scripts could not be compiled since the class <code>DeviceStateChangedEventArgs</code> was unknown.
Preview in Windows Explorer	The preview in the Microsoft Explorer is now independent of the default program linked. For this reason, RAW-data are now displayed correctly in the preview, even if RAW is linked with an image processing program.
Experiment/Export project	The imcStudioExport-files are now compressed upon exporting.
Installation	An update installation from one Version 2023 to a newer Version 2023 did not recognize the existing installation if a Version 5.2 was installed in parallel. This caused parallel installation of multiple 2023 versions to occur. As of 2023 R5, any older versions are once again recognized and uninstalled correctly. If you have installed multiple parallel 2023-versions on your PC in this way, then note the following: It is not possible to uninstall the remaining 2023 version(s) once any of the existing 2023 versions has been uninstalled. These will continue to appear in the window "Programs and Functions". This will not cause any loss of functionality. Please contact our Technical Support team if you wish to completely remove the version. Attach the following number: IT041604 to your service request.

3.4 imc STUDIO 2023 R4

3.4.1 General Changes in imc STUDIO

The new **imc STUDIO 2023 R4** has overcome certain obstacles to greater **performance**. Both **data storage** and the **Automation** have been under exact focus and in consequence the system power has been increased.

Much attention has been devoted to the **new fieldbus assistant** for the imc ARGUS*fit* family of devices. As an enhancement of all imc ARGUS*fit* devices, the new **CAN FD module** is now available.

As well, the first step towards new **metadata handling** has been taken successfully. Saving **metadata in the channel files** is now again possible.

Additionally, **analyses using Python** are now also possible by means of the new command.

3.4.2 Performance improvements



Saving data with large channel counts

The saving of very many channels to the PC hard drive now no longer puts very high demands on the CPU. Furthermore, a problem has been fixed which had caused a continuous rise in the handle value generated by the data saving.

Automation imc FAMOS Data cutting - cutting many channels

The function Automation imc FAMOS Data Cutting made very high demands on the CPU when cutting was performed on a large count of channels.

Speedup of first imc FAMOS-command call

Previously, the first run of an imc FAMOS-command after having started imc STUDIO would require significantly more time than subsequent runs. The reason for the delay is that imc FAMOS would be starting at that time. The system waited until imc FAMOS was running in the background. Subsequent calls would proceed quickly once there was no need to restart imc FAMOS.

New behavior: Now when an imc FAMOS-command is created or loaded, imc FAMOS is already opened in the background. Since the program is running in a separate process, there is no delay of imc STUDIO as a consequence. Thus the start occurs at a point in time at which no imc FAMOS analysis is running.

3.4.3 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.16 R4](#) 
- [Firmware imc DEVICEcore 3.6 R4](#) 

3.4.3.1 Firmware imc DEVICES 2.16 R4

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
imc Online FAMOS	Function: <code>OtrFrequLine</code> : The parameter " <i>Period length</i> " was no longer accepted as a decimal number.
CAN-Interface	• CAN FD When CAN FD messages were sent in Motorola format, it caused the measurement to crash. • A2L import: "<i>MAXTIX_DIM</i>" is supported.
Connection to the device	The firmware programs are automatically allowed in the " <i>Windows Defender Firewall</i> " upon installation. For this reason, popup dialogs about the firewall no longer appear upon first connecting to the device.
WFT	The imc Online FAMOS-function <code>RunAutoBalance</code> now also starts the balancing of the WFT-channels both via imc STUDIO, e.g. with a virtual bit, and in Autostart.
Hardware imc SPARTAN BC16	Low passes with a corner frequency < 5 Hz showed an amplitude which was too low.

3.4.3.2 Firmware imc DEVICEcore 3.6 R4

Hardware



imc ARGUSfit-CAN FD

imc ARGUSfit-CAN FD - At a glance

- Two individually galvanically isolated CAN nodes
- CAN FD (max. 8 MBaud), CAN High Speed (max. 1 MBaud), CAN Low Speed (max. 125 KBAud)
- Configurable with new CAN assistant in imc STUDIO
- Decoding of physically and numerically scaled parameters or measuring channels. Such channels can also be used as trigger source, in live analysis (OFA) and in PC-less stand-alone mode
- Logging of the raw, undecoded send and receive data as log channel in imc TSA format (Time Stamped ASCII).
- Log channel can also be decoded outside the interface via imc STUDIO BusDecoder (live) or via imc FAMOS (post-processing), thanks to embedded dbc information
- Support of imc CANSAS modules (CANFX, CANFT) with configuration via dbc file exchange
- Power-via-CAN for supply of imc CANSAS modules by the imc ARGUSfit system: Can be activated by software and with electronic overload protection
- Automated cyclic output of protocol sequences for initialization or activation of sensors and subsystems

CAN FD Interface for imc ARGUSfit

The CAN FD interface is a clickable module for the modular imc ARGUSfit system. Together with the analog imc ARGUSfit measurement amplifiers, several of these interfaces can be docked to an imc ARGUSfit base. The ability to acquire CAN-based measurement data and log channels can thus be flexibly added to such a measurement system.

Two CAN nodes are provided at DSUB-9 sockets with standardized pinout. For the logical decoding of the channels, the module has a local intelligence in the form of a processor. This relieves the imc ARGUSfit base unit and the overall system is easily scalable in its total performance even with several interfaces.



CAN FD - Fieldbus assistant for imc ARGUSfit in the new design

In preparation for all future fieldbus variants, a new assistant has been developed. For all fieldbus variants of the imc ARGUSfit family of devices, a uniform user interface will thus be achieved.

The first fieldbus available is CAN FD. This is configured in the new look.

NODES

NODE_001

NODE_002

MESSAGES

MESSAGE_001

CHANNELS

RPM1

RPM2

torque

speed

wheel_LF

wheel_RF

wheel_LR

wheel_RR

temp_01

temp_02

temp_03

temp_04

pressure_01

pressure_02

Channel definitions

Name RPM1

Comment

Number format Real Number

Start byte 0

Start bit 0

Number of bits 32

Byte order Intel

Unit 1/min

Validity

Error Handling

New fieldbus assistant: CAN FD

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Balancing	When balancing was performed, this was previously only possible during a running measurement. Measurement may have needed to be started for the purpose of balancing. Now, the balancing can also be performed if the measurement is not running. Previously, the action "Prepare" was performed if changes to the configuration were detected.
Transfer configuration	By means of device de-selection, it is possible to transfer an imc ARGUSfit device's configuration to a different imc ARGUSfit device. This happens in the same way as is familiar from firmware group A devices.
Channel configuration	The configuration of imc ARGUSfit-channels can now be copied and pasted from one channel to another one by means of the keyboard combinations CTRL+C/CTRL+V. This matches the method for imc DEVICES.

Note

Firmware update - Compatibility

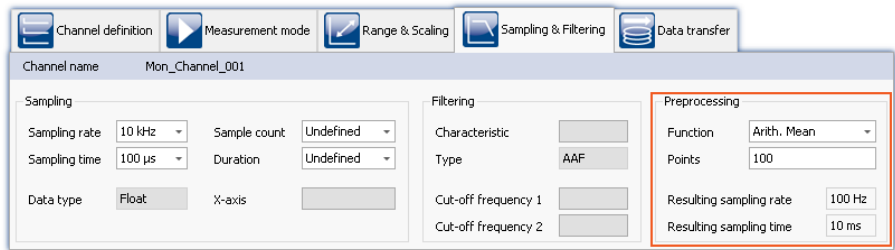
A device belonging to firmware group B with imc DEVICEcore Firmware Version 3.6 R4 (under imc STUDIO 2023 R4) can not be downdated to Firmware Version 3.6 R3 (under imc STUDIO 2023 R3). For imc STUDIO 2023 R3, a patch can be requested from our tech support. Add this number to your query: IT041172.

3.4.4 Setup and Device Control



Access to the preprocessing also via the simplified view

Preprocessing is now also available in the simplified view "Standard".
By means of the preprocessing, it is possible, among other things, to perform data reduction on imc ARGUSfit channels. For this purpose, various reduction methods are available (Mean Value, Min, Max, ...).



Info on compatibility: existing views will not be modified automatically. To obtain this functionality, the Standard-view must be reset.

Stipulated sorting according to devices

Sorting of the triggers according to their names has been deactivated. Internally, the sorting is always performed according to the hidden columns "Device SN" and "Trigger ID". In this way, the positions of the triggers always remain intact.

Triggers

Trigger name	Trigger ID	Device SN	Source
Trigger_01	1	126678	Channel_001
a_Trigger	2	126678	Channel_002
Channel_003_Trigger	3	126678	Channel_003
Trigger_001_T_4160044	1	4160044	Channel_001
a_Trigger_T_4160044	2	4160044	Channel_002
Channel_003_Trigger_T_4160044	3	4160044	Channel_003



Parameter set export - more precise selection

More precision is available in choosing parameter sets for export of the configuration. By separating the criteria "Channels" from "Parameters", it is now possible to make a more specific selection of desired parameters.

The file thus generated only contains the information required. This means that in many cases any subsequent re-processing and data reduction are no longer necessary.

When export of the parameter set is performed via the menu ribbon item "Setup-Configuration" > "Export configuration", the selection dialog appears as follows:

Channels

☒ Only the selected ones

☐ Active ones on "Analog channels"

☐ All on "Analog channels"

Parameters

☒ Only the selected ones

☐ All on "Analog channels"

☐ All existing ones

☐ Balancing settings

☐ Choose manually

The left column presents the selection of channels whose parameters are to be exported. The choices offered are only the selected channels, or only the channels set to "active", or all channels. The right column presents the selection of the parameters to be exported for the channels.

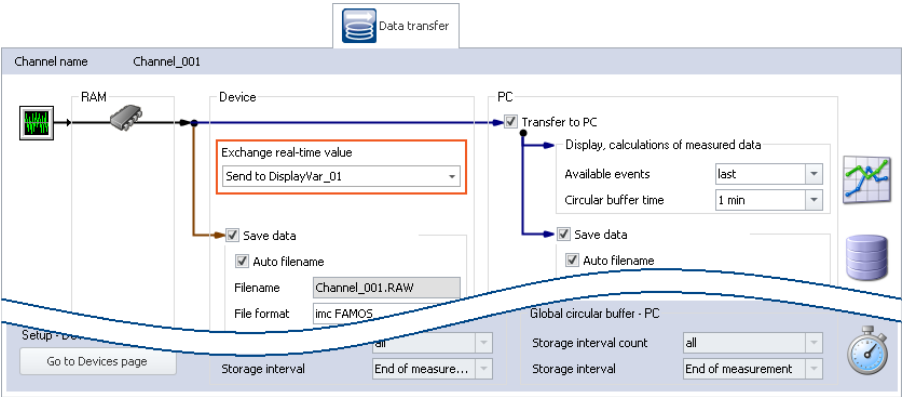
Selection	Description
Only the selected ones	All parameters which are selected are exported.
All on "Page name"	All parameters are exported which are visible on the page. These included all columns in the table, but also all parameters in the dialogs and on additional tabs (e.g. the three tabs on the page: "Channel balance")
All existing ones	All parameters defined in the table description are exported. (Including such which are not present in the table.)
Balancing settings	The balance settings are exported, regardless of the Setup page selected.
Choose manually	A dialog for selecting the desired columns appears. In this dialog, select all parameters which you wish to export. All parameters selected are exported.



Exchanging values between devices

imc ARGUSfit devices can send values to the Display variables of imc devices belonging to firmware group A (e.g. imc CRONOS, imc C-SERIES, ...). However, reception of values from other devices is not possible.

In this way, it is possible to integrate imc ARGUSfit devices into existing measurement setups which require the exchange of Display variables.



Assigning an imc ARGUSfit channel to a Display variable

3.4.5 Metadata



Saving metadata with the channel

Metadata can be saved directly in the channel file. No separate file is created. This means the relevant information is saved **in all channels** and thus **in all channel files** on the PC hard drive.

Column selection

In the Options "Setup" > "Traceability of data", you have the choice of which groups of parameters to save.

Various groups of Setup-parameters are available for selection, which can also be saved. The tooltip for each of these selections contains an exact list of all parameters. Here is an overview:

Groups	Description
Basic information	Device serial number, channel number, module serial number
Hardware information	Among others connector, channel type, module number, module type, amplifier calibration date
Channel settings	Among others measurement mode, coupling, offset, factor, bridge parameters, inc.-parameters, filter parameters
Metadata	All user-defined metadata columns, which had been created for the channel

Reading out metadata

Use the following imc FAMOS-commands in order to read out the metadata saved with the channel: [UserPropText?](#) (for texts) or [UserPropValue?](#) (for numbers).

Access to the metadata via placeholders is not possible at this time. For this reason, simple display on the Panel and as a column in the Data Browser are not yet available.

3.4.6 Python

The Python command supplies functions which provide a bridge to the Python programming language. imc STUDIO generates an embedded instance of the Python runtime environment, which provides an interpreter for the Python programming language.

Python is an all-purpose object-oriented programming language which enjoys widespread prevalence especially in education and science/technology due to its accessibility for beginners, its platform independence, expandability and its free availability (Open Source). A large number of libraries are available, e.g. for numerical calculations, visualization of data, image analysis and all the way to machine learning. Familiar expansion libraries for the field of science and technology include NumPy, SciPy and TensorFlow.

For the purpose of analyzing the measured data, a Python code file is selected. The variables to be analyzed with Python can be selected, and the results can be returned in variables.

Data types

The following variable types can be transferred **to Python**:

- single values (numerical),
- standard channels (uniform, equidistantly sampled channels, not time-stamped)
- individual trigger releases of a standard channel (only as "last event")
- segmented channels (e.g. FFT) and
- vectors

What can not be transferred are such channel properties as the sampling rate, time, unit,

The following data types can not be used:

- text-variables
- time-stamped, non-equidistant channels (TSA, ...)
- multiple trigger releases of a channel (event-based channels)
- similar data types

Various **return value types** are supported, e.g:

- single values (numerical) or
- arrays, interpretable as a normalized channel with a sampling interval of: 1.

Transfer and processing of the variables is performed on the basis of the "*Current Measurement*" and not on the basis of any saved (earlier) measurements.

System requirements

Support is provided exclusively for the Python reference implementation from the "*Python Software Foundation*" (CPython) in one of the versions listed below; these can be downloaded and installed from <https://www.python.org/>.

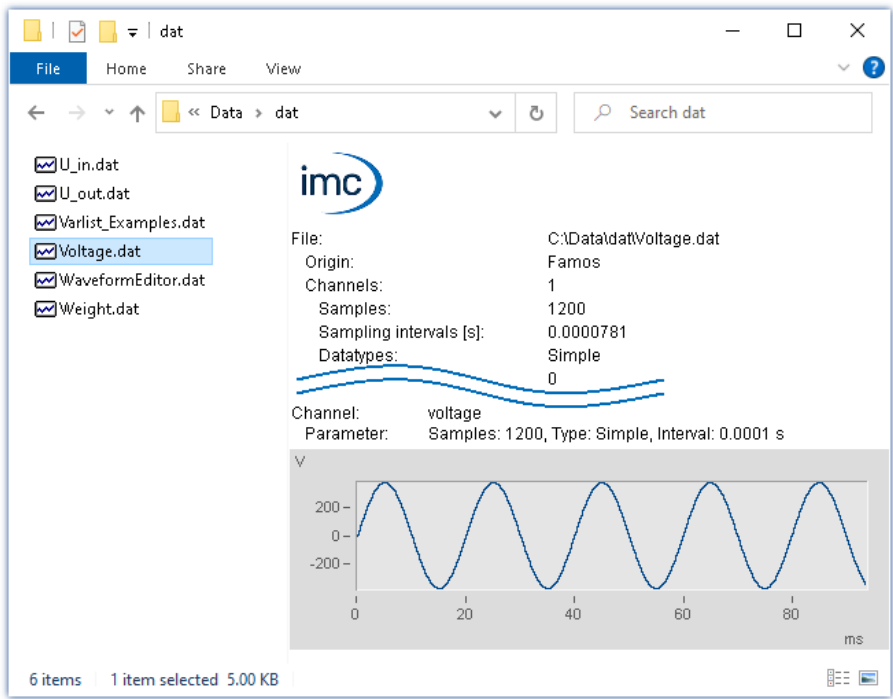
- Python 64 bit is installed
- Compatible Python versions: 3.11, 3.10, 3.9 and 3.8 (64 bit)

3.4.7 Explorer-Preview



Measured data in the Windows-Explorer's Preview window

imc FAMOS files (*.dat) can be displayed by the Microsoft Windows-Explorer using the Preview-function.
This function is now also available without having to install imc FAMOS. Installation of imc STUDIO also enables this function.



Activation of these functions for *.raw without imc FAMOS is not possible at this time.

3.4.8 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Setup	In some cases, channels' units would not be displayed correctly. For instance, "°C" became "?C" and "µm/m" became "?m/m". This problem was caused by certain mixed language settings for the format in Windows. The problem persists in channels when are created with the imc CANSAS software. Other channels are no longer affected.
Parameter set export	The .data-folder is only created when metadata are also exported and saved there. E.g. PDF-files or images. Previously, the folder was always created whenever a parameter set was exported.
imc Online FAMOS	• New menu action "<i>Undo all</i>": Reverses any changes which have been made to the source text since the Editor was called. • In the imc Inline FAMOS Editor's toolbar there is now an "<i>Undo</i>" button. In return, the button "<i>Close dialog</i>" is omitted, since this is usually accomplished using the "X" button.
Widgets	Table (e.g. Automotive): The texts of the zones were not displayed in the dropdown-list of the cells. Only the values for the zones were displayed.

Area	Description
Curve window	The color map setting for " <i>Interpolation, cubic polynomial</i> " caused a crash when a vector was displayed.
Logbook	Copying entries, including supplemental information The copied text can now optionally be supplemented with the stack-trace. This helps our tech support to analyze errors reported to us. To do this, open an entry's context menu and select "<i>Copy with details</i>". All of the entry's information is then copied to the Clipboard. Additionally, the text resulting from normal copying has been slightly adapted.
User administration	• If a user did not have experiment saving privileges, then they could also not load any experiment. Upon loading, the system would check whether any changes would need to be changed, and this prevented loading from proceeding. Now in such cases, any changes are ignored, so that users having this role can also easily load an experiment. • The privilege "<i>Sequencer: Visible event scope</i>" took no effect. Now the respective event ranges are hidden according to the privileges specified.
Scripting	• By means of the new Help-button in the Scripting tool window, it is possible to open the documentation on Scripting directly. • When utilizing a Panel-script, the Run and Stop methods were not called if the Panel was opened on a second monitor.
API	In the WpfSetParameter-project's ApplicationInterface, the button " <i>Config</i> " is now also operable before any device has been selected. The device list for selecting a device is thus accessible via this button.
GoPro	GoPro HERO8 enables display of the livestream in the widget during running measurement. The other GoPro models still do not offer this ability.
Installation	When a 2023 R3 was installed in parallel with an existing 2022 version, it was no longer possible to open some lists of Setup parameters in the 2022 version. This affected the following areas, among others: • Command: Device action • Default values • Table description Installation of Versions 2022 and 2023 R4 in parallel is now possible. For Version 2022 R3, it is possible to order a patch from our tech support if this error occurs. When making this request, provide this number: IT041164.
Translation	Numerous texts have been translated into Japanese.

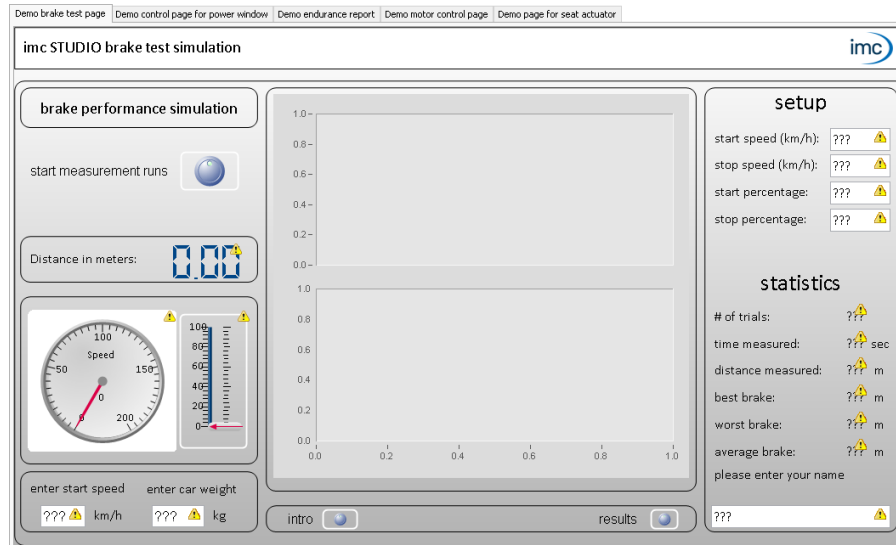
3.5 imc STUDIO 2023 R3

3.5.1 General Changes in imc STUDIO



Panel - Demo-pages

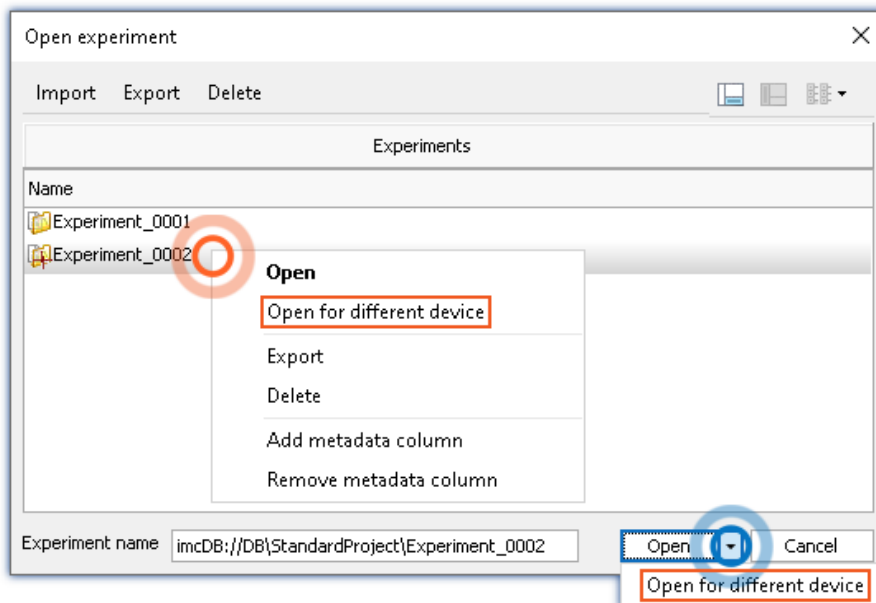
There are a variety of Demo-pages which provide a quick overview of how a Panel page can look and of which functions are available. These are found in the "Page repository".



Opening an experiment for a different device

In the "Open Experiment"-dialog, the selected can now not only be opened but also transferred to a different device.

This is possible by using the experiment's context menu or by means of the "Open"-button's drop-down-list.



Additionally, some improvements have been made to the dialog user guidance.

3.5.2 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.16 R3](#)  57
- [Firmware imc DEVICEcore 3.6 R3](#)  58

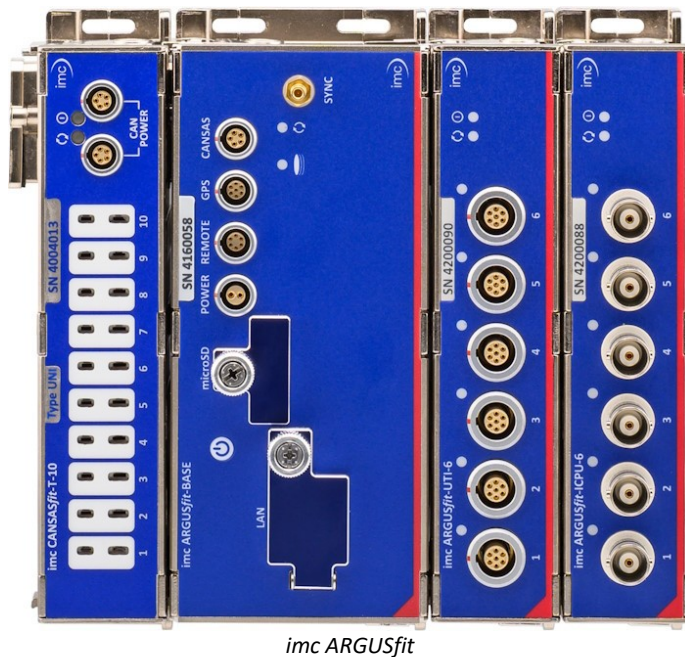
3.5.2.1 Firmware imc DEVICES 2.16 R3

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Function
CAN assistant	When an A2L-file was imported whose name plus the pathname contained more than 122 characters, import failed.
CAN-Interface	In the Prepare stage, the device would restart when other channels besides an ECU configuration were created in the CAN-configuration.
XCP on CAN	• For the XCP-protocol, it is now possible to extract the ECU reception channels from the log channel. Sending channels are not supported. The ECU-channels can be decoded from the log channel either after measurement with imc FAMOS or during measurement with Bus Decoder. • When decoding digital channels, the original names from the A2L-file are now used.
imc BUSDAQflex with CANFD	The device restarted in response to high data volume on multiple CANFD-nodes.
imc BUSDAQflex	A watchdog now monitors the WLAN connection. This ensures that the WLAN connection is re-established even if no DHCP server is available at the time of waking up (even with WakeOnCAN). The watchdog checks at regular intervals whether the DHCP server is available again and requests an address.

3.5.2.2 Firmware imc DEVICEcore 3.6 R3

Hardware



imc ARGUSfit - At a glance

- Very compact, high-performance data acquisition system
- Particularly flexible: modular system without mainframe
- Click mechanism: connects modules electrically and mechanically
- Decentralized installation via fiber optic cables
- Up to 5 MSample/s aggregate system sampling rate
- High channel data rates (and bandwidths), up to 500 kSample/s at 24-bit resolution, depending on the module type
- Multiple individual channel sampling rates
- Integrated real-time analysis through built-in imc Online FAMOS
- Full integration of imc CANSASfit
- Combination with all imc system families and synchronous acquisition of thousands of channels

imc ARGUSfit – fast, compact and modular measurement systems

imc ARGUSfit is a compact modular system that allows the user to flexibly assemble fast data acquisition systems (DAQ). Both the base unit and the flexibly combinable measuring modules have independent housings which are connected by a "click" mechanism (no tools required) to form a DAQ system.

imc ARGUSfit covers the entire frequency range of physical measurement applications with a aggregate sampling rate of up to 5 MS/s and channel rates of up to 500 kSample/s, depending on the module type. Various such measurement modules for common signals and sensors are available and more will be released in the future.

The system achieves particular flexibility by extending modularity even to decentralized topologies. The internal system bus can be converted to fiber optic cables by means of a media converter extension module in order to integrate spatially distributed module blocks.



imc ARGUSfit also provides complete integration of the imc CANSASfit module series for slower channels, e.g. for temperature measurement. Such imc CANSASfit modules (CANFT) are likewise internally connected with power and CAN bus and are fully supported and integrated by the software as a uniform system. Finally, imc CANSASfit modules can even be installed in distributed topologies and connected via CAN-cable to the imc CANSAS-Interface of the base unit.

Multiple DAQ systems of the imc ARGUSfit series as well as other imc data logger and measurement systems can be interconnected via Ethernet. This provides the ability to operate very large and multi-channel setups in which different imc device series work together seamlessly and in complete synchronization.

imc Online FAMOS



Data analysis in the measurement device: Results in real time

imc Online FAMOS is a powerful extension included in every imc ARGUSfit DAQ system as a standard without any additional license required. It offers a variety of real-time functions for pre-processing and signal analysis. The mathematical analysis functions are executed on the signal analysis platform integrated in the measurement device. This means that analysis results are available immediately and also independently of the PC. Such pre-processing can also yield significant data reduction and thus reduce the amount of data to be exchanged between the DAQ system and the PC. The results are available in imc STUDIO as virtual channels.

imc Online FAMOS is now available in a limited version for imc ARGUSfit devices.

Supported functionalities

Currently, the functionality of imc Online FAMOS for imc ARGUSfit comprises all major math and standard analysis functions. The following special functionalities are not supported yet:

- imc ARGUSfit does not provide any virtual bits and display variables or comparable system variables.
- pv-variables cannot be created.
- imc Online FAMOS Professional with synchronous tasks is not available and thus imc STUDIO Automation for real-time test automation is not supported.

Note: Supplemental files are imported via the imc Online FAMOS dialog and not via the Setup menu ribbon.

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Function
Device time	The device time is reset along with resetting of the PC-time upon preparing the device.
Devices list	It was not possible to remove the device from the Devices list (details: set as unknown) if the device was set with an unreachable IP.

3.5.3 imc SIMPLEX



imc SIMPLEX enables extremely fast configuration of imc ARGUSfit-channels by means of validated sensor settings prepared in a cloud. This massively reduces the risk of errors in configuring a measurement system.

S i M P	
Sensor Serial No	0815-0123-9876
Type of Measurement	Acceleration
Signal Name	AccelerationSignal01
Measurement	
Type of Measurement	Acceleration
Signal Unit	m/s ²
Secondary Unit	V
Parameters	
Sensor Sensitivity	0.66667 V/m/s ²
Measuring range	3.75 m/s ²

Simple:

- When you scan a sensor with your cell phone, the sensor is displayed in imc STUDIO. By means of Drag&Drop it can be dragged to the target channel. The channel adopts all of the sensor's information and is ready for measurement.
- When you have a pile of cable terminals in front of you, how do you know which one is the right one? Simple: all cable terminals are equipped with RFID. The app lets you scan the cable terminals and obtain the info indicating what terminal you are holding in your hand.
- You have a cabinet full of sensors in their packaging. The packaging is equipped with RFIDs. Using the app, you can scan a package to find out what sensor it contains and whether it is right for your measurement, and even whether it is already appropriately calibrated.

All this is possible thanks to imc SIMPLEX.

Product overview

imc SIMPLEX consists of three components: the imc STUDIO plug-in, the mobile app and the website.

Using the website interface and the mobile app it is possible to set up and configure sensors. This determines which imc measurement modules can measure with the sensors. The finished sensor configuration is made available in a database. If the sensor is equipped with RFID, a barcode or QR-code, it can be scanned with a cell phone. imc STUDIO then provides the appropriate sensor configuration to apply to the channel. It is also possible to enter specific measuring point definitions including harmonized signal names, or generic sensor types.

Functions

- Access to imc SIMPLEX sensor database via the Internet. The sensor database is supplied by imc.
- Sensor configurations are saved in the database. There is no limit on the sensor count.
- The sensors are either set up/edited via the website, or with certain limitations via the mobile app.
- The sensor configuration comprises everything from the measurement type (temperature, pressure, ...), to calibration (offset, sensitivity), all the way to the sampling rate.
- imc SIMPLEX provides an indication of which modules the sensor is suitable for.
- The sensors are made available in imc STUDIO and can be dragged to the desired module channels, which then apply the entire configuration.
- It is possible to assign RFID-tags to the sensors. The RFID can be applicable either to individual sensors or to a whole sensor type. Example: the RFID is attached to a sensor or a cable, or it is attached to a box and pertains to all of the sensors in that box.

- A cell phone can scan the RFID, and the app then automatically displays all of the sensor's information. The Sensors list in imc STUDIO displays the corresponding sensor so that it's entry can easily be dragged to the desired channel. This is possible whenever the same imc SIMPLEX user is logged in to both the PC and the app.
- In order to use imc SIMPLEX, each user needs a user account. These user accounts can be set up by the database's designated administrator. For this purpose, a variety of user roles having associated privileges are available:

Function	Reader	Editor	Admin
Sensor reading	•	•	•
Sensor assignment to channel	•	•	•
RFID scanning	•	•	•
Sensor setup		•	•
Sensor editing		•	•
Sensor deletion		•	•
User setup			•
User role editing			•

Supported imc measurement device groups

A device belonging to the firmware group B - e.g. imc ARGUS*fit*, imc EOS.

System requirements

- Browser: an up-to-date browser
- Cell phone operating system: Android 5 or higher, or IOS 10.3 or higher (find details in your respective app store)
- Cell phone: NFC-enabled or barcode/QR code enabled, depending on application
- imc STUDIO 2023 R3 or higher
- Connection to the internet with access to the imc SIMPLEX server

Licensing

Licensing is independent of imc STUDIO and the imc LICENSE Manager.

- **Separate licenses** are required for imc SIMPLEX, which cover the **use of the cloud services** and the imc SIMPLEX Assistant.
- The license model is a **subscription** that is activated or renewed by **paying an annual fee**.
- Licensing involves creating user accounts on the imc SIMPLEX server. Upon order, the number of allowable user accounts is specified. Later extensions are supported.
- A user account includes the authorization to log in to the imc SIMPLEX server via the mobile app, the website and via imc STUDIO. In addition, depending on the configured user role, it allows the configuration and/or readout of sensor information. A user account is not bound to specific devices.
- The installation of the mobile app and the imc STUDIO plug-in are license-free. However, their meaningful use requires log-in with a licensed user account.

3.5.4 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Setup - Default values	It had not been not possible to set the parameter for a default value. Instead, an error was reported.
fos4X	Measured data from 3rd-party fos4X-devices had previously not been saved in intervals. Now it is also possible to activate interval data saving for these devices.
Sequencer	Discontinued: Sequencer command " <i>Transfer device settings</i> " The command " <i>Transfer device settings</i> " is no longer supported. Notes on compatibility: Load an experiment belonging to the predecessor version which contains this command: In the sequence in which you use this command, an "empty" command is inserted as a placeholder to mark the location.
Sequencer	The context menu in the Sequencer's Events area could not be opened if the user role had previously been changed, if the project had previously been switched, or if an experiment was transferred to a different device.
User-defined events	The user-defined events " <i>Trigger Start</i> " and " <i>Trigger Stop</i> " for a trigger having a defined source would fire if the BaseTrigger fired. Now the BaseTrigger does not release the user-defined trigger events of other device triggers.
Automation	When imc CANSAS was opened, an existing Automation configuration was lost.
Inline Analysis	- Monitor channels can now be used as the input channels of calculations. - When the IEPE calibration window was called twice in succession, imc STUDIO no longer reacted.
imc Inline FAMOS	- When a saved experiment contained source text for imc Inline FAMOS, no message was posted if the component imc Inline FAMOS was not activated. Now, an error message is posted upon loading the experiment to indicate that the component must be activated in the "<i>Product configurator</i>". - When an imc FAMOS analysis was performed only with 3rd-party devices, upon starting the measurement, the message "<i>BaseTrigger: Channel name empty</i>" was always shown.
Powertrain Monitoring	It had not been possible to successfully check the configuration in the view " <i>Show configurations</i> " if a dropdown-box for the drive elements was previously filled in.
Scripting	In the Scripting, for imc Inline FAMOS functions, the return variable type " <i>Result</i> " has been changed to " <i>IssueResult</i> " in order to avoid collisions with the variables-functions.
imc STUDIO API	With API, the Channels list in the WinForms example now is sorted alphabetically.
Product configuration	In the " <i>imc STUDIO Standard</i> " edition, Data Processing is now activated by default. Previously, there had been a problem in which a Data Processing-component such as Bus Decoder or imc Inline FAMOS would fail to be displayed upon being activated, because Data Processing additionally needed to be activated. Still applicable: If Data Processing is deactivated manually, it will not activate automatically when another Data Processing component is activated.
User administration	The menu action " <i>Save experiment</i> " did not update the state when the user was changed. Therefore, it was not possible to save an experiment if the previously logged in user did not have the right to save. Now the state of the menu action is updated when the user is changed.
Options	When the dialog for calling the database path is called, the system now highlights the currently selected folder as the default choice.

Area	Description
Installation	When installing imc DEVICES by means of the imc STUDIO-Installer, the J1587-packet is no longer included in the installation.
Deinstallation	Deinstallation failed to remove the entry " <i>imc STUDIO Logbook</i> " from the Start menu.

3.6 imc STUDIO 2023

3.6.1 General changes in imc STUDIO

Setting the expected signal value range in addition to the measurement range

For some sensors, it is sometimes desirable not only to define the measurement range, for example ± 10 kN or $-270..500$ °C, but also an expected value range, e.g. $0..9$ kN or $20..80$ °C. The expected value range is usually only a subset of the measurement range. The intention would be to display only values within that range in order to be able to directly concentrate attention on the relevant portion.

Whenever values outside of this range are measured, they are to be considered overmodulation. This provides a quick indication that something is not right at the moment, even if there is no actual overmodulation from an electrical standpoint.

When such a display range is specified, the measurement range is initially used as the display range for the Widgets. Instead of assuming the fixed values $0..10$ as previously, the system now uses the channel's display range directly. Thus, it is not necessary to adjust the range for every Widget.

With all Widgets, it is still possible to set a different range, so that it is possible to display a variety of ranges.

Details on changes implemented

Renaming of Setup-parameters

Setup page: "Analog/Digital channels" - Dialog "Curve properties"

 Curve properties

Channel nameChannel_001

Range

Auto

Min

-10

Max

10

Color

☐

 auto

Old name	New name		
	long name	short name	column ID
Y-axis option	y-axis range	Range	eCurveYAxisOption
Y-axis min	y-axis min	Min	eCurveYAxisMin
Y-axis max	y-axis max	Max	eCurveYAxisMax

Notes on compatibility:

When designations of parameters are changed, modifications are necessary if these parameters are used in a "Parameter set file". If you import existing parameter set files containing these parameters, please revise these files, replacing all instances of them using a text editor.

Level indicators

"Current value"-column in the Setup, as well as the Widget "Level indicator"

The level indicators previously used the measurement range for the upper and lower boundaries. If the parameter "y-axis range" is set to "User-defined", you can define an expected value range for the sensor by means of the parameters "Y-axis min" and "Y-axis max".

When values outside of this range are measured, the level indicators indicate overmodulation even when there is none from an electrical standpoint.

A range is always provided

The channel now always provides the Widgets with a display range. The Widget uses this range by default, but can also use a custom range. By means of the property "y-axis range" you define how the Widget is supposed to respond.

Choice	Previous function	New function	Affects the Widgets
Auto	No transmission of range information	Max- and Min-values match the measurement range set for the channel	scale-Widgets
Input range	Max- and Min-values match the measurement range set for the channel	no change	- scale-Widgets - curve window (rezoom)

Choice	Previous function	New function	Affects the Widgets
User-defined (min, max)	Max- and Min-values can be set in the parameters further below	<i>no change</i>	• scale-Widgets • curve window (rezoom)

By default, Widgets such as the pointer instrument or the bar chart, now use the specified measurement range or the fixed specified display range of the channel. In many cases, no modification is necessary any longer, or the range can be governed by means of the parameters for all Widgets which display the channel.

Notes on compatibility:

When loading existing experiments, observe the following: Upon conversion, all existing Widgets are set so that they do not use the channel's specified range. Background: By default, the Widgets are set to adopt the range. However, no range had previously been transferred when the channel setting for "y-axis range" was set to "Auto". Since a range is now always transferred, not all Widgets would display the previously set range. In case you have already used this function anyway, please modify this property's value. Open the Widget's Properties and change the setting "Range" to "From Variable".

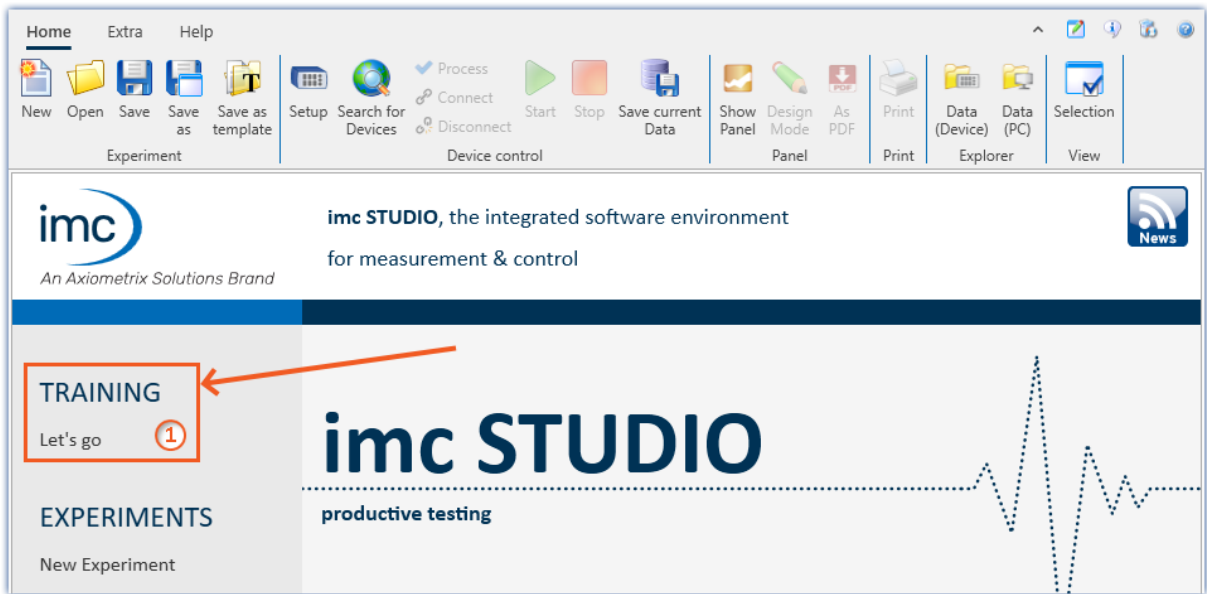
3.6.2 Introduction and operation aids



What steps are needed for obtaining measured data?

An Assistant is provided to help you become familiar with the system. The first steps – selection of the device, channel configuration and display of the measured data – are usually identical.

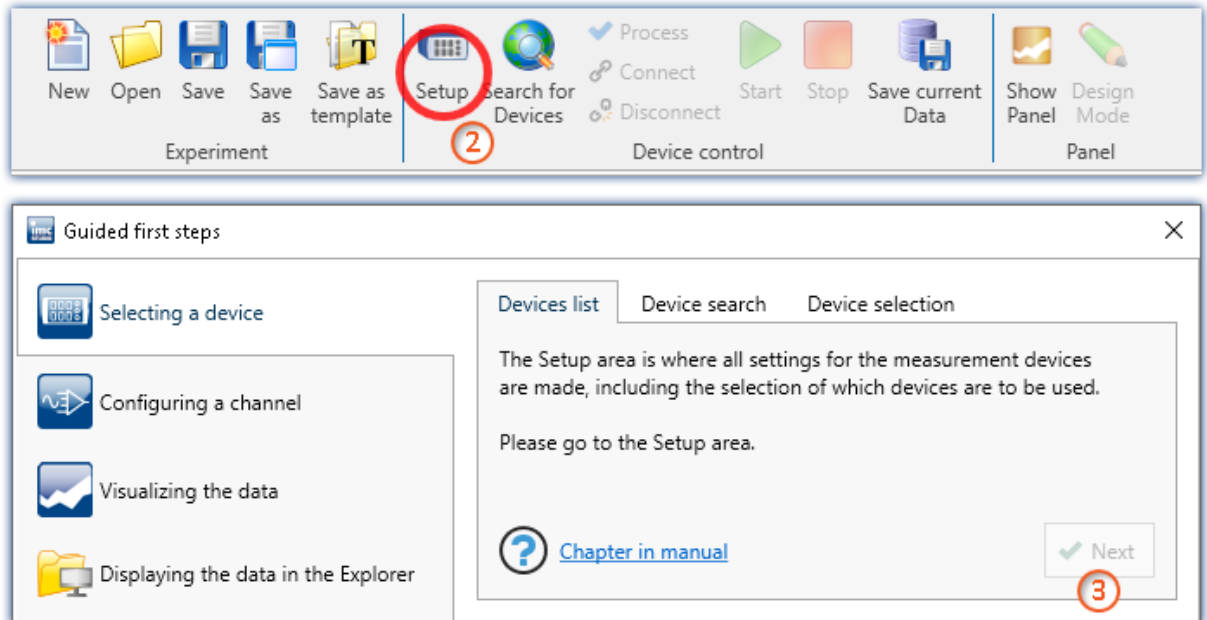
Start the Assistant from the homepage directly after starting imc STUDIO. Click on "Let's go" ①. You are able to start and repeat the Assistant again at any time.



Starting the Assistant

A dialog appears, in which the next steps are explained to you. As an aid in orientation, a pulsating circle ② appears in the imc STUDIO user interface in order to highlight the interface element with is the topic of the descriptive text.

As shown in the example below, the next step is to open the Devices list. To do this, it is enough to click on the button "Setup" in the menu ribbon. The Assistant recognizes when the assignment has been completed, and only then enables the "Next"-button ③.



Der Assistent gibt Hilfestellung durch grafische Hervorhebungen und informierende Texte

By means of the tabs, you can repeat or skip steps.

Each page contains a link to the pertinent section in the user's manual, where you can find advanced descriptions of the respective pages and steps.



Help with the device's network configuration

By means of the device interface's configurations dialog, you can directly open the PC's adapter settings ①. Additionally, there is a direct link at the bottom to the section of the documentation which deals with interface configuration ②.

Devices found (serial number)

Currently not reachable

Recently edited

Ready for measurement

- T_122339_CS7008 (122339)
- T_123020_CRPL_2_DIO (123020)
- T_123310_CS1208 (123310)
- T_126678_CS_7008_1 (126678)
- T_126679_CS_7008_1 (126679)
- T_126680_CS_7008_1 (126680)
- T_130098_busDAQ_X (130098)
- T_130820_busDAQ_X (130820)
- T_132704_BUSFX_2_S (132704)
- T_140165_CRC_400 (140165)
- T_140562_CRC_400 (140562)
- T_141127_CRFX_400 (141127)
- T_142115_CS_7008_N (142115)
- T_142203_CS_7008_N_1 (142203)
- T_142996_CRFX_400 (142996)
- T_144431_CS_7008_FD (144431)
- T_144432_CS_4108_FD (144432)

Device information

Device name: T126678_CS_7008_1

SN: 126678

Device identifier: imcDev_12126678

Current PC configuration

Configuration type: Manually configured

IP address: 10.0.11.75

Subnet mask: 255.255.255.0

Gateway: 10.0.0.1

DNS server(s): 10.0.0.10

Current device configuration

Configuration type: Manually configured IP a...

IP address: 10.0.11.86

Subnet mask: 255.255.255.0

Gateway: 10.0.0.1

DNS server: 10.0.0.10

New device configuration

Interface: LAN

Configuration type: Manually configured IP address

IP address: 10.0.11.86

Subnet mask: 255.255.255.0

Gateway: 10.0.0.1

DNS server: 10.0.0.10

Domain:

Apply

Reset

Search for devices

Help

Advanced Configuration

Close



Various other aids in introduction and operation

- Sample-Widgets for starting/stopping measurement are provided in the "*Repository*".
- Hot Tracking: Supposing you wish the Setup-tables to show which parameters belong to the same channel. A channel's name appears at the left, and at the right, the respective channel's sampling rate is stated. To make this easier to recognize, the entire row is now highlighted whenever the mouse cursor moves over it.
- The homepage has been revised and de-cluttered so that certain functions can be more easily and quickly found.
- Import of experiments has been simplified:
 - If the export file doesn't contain any measured data, the system does not ask whether measured data are to be imported.
 - If the export file contains only one experiment, the selection of experiments to import is skipped.
 - If an experiment of the same name already exists, the system asks whether to overwrite or rename it.

Quick access toolbar

The Quick Access Toolbar has been reduced down to only relevant actions.

This toolbar always provides rapid access to the important actions. There should not be too many of these, in order to avoid losing a good overview. The toolbar has thus been limited to the following actions: "*Open experiment*", "*Save experiment*", "*Start measurement*" and "*Stop measurement*".

It remains possible for the user to customize the quick access toolbar.

Notes on compatibility:

Existing view are not automatically modified and remain unchanged.

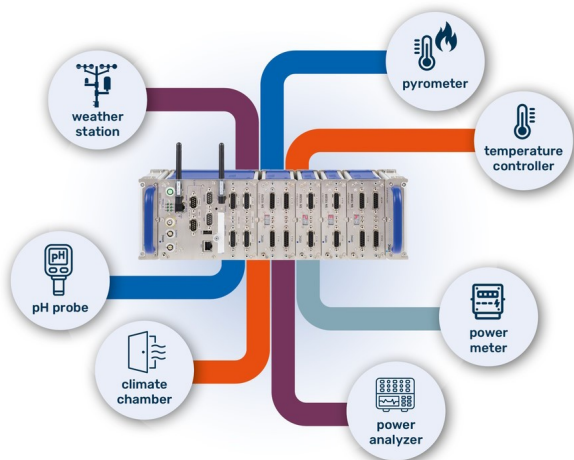
3.6.3 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.16 \(R2\)](#)  69
- [Firmware imc DEVECore 3.6 \(R2\)](#)  71

3.6.3.1 Firmware imc DEVICES 2.16 (R2)

Seamless Integration of 3rd Party Devices, Sensors, and Equipment



New Modbus Fieldbus Interface

The imc Modbus interface is a fieldbus module that can be used to equip imc measurement devices such as imc CRONOS*compact*, CRONOS*flex*, SPARTAN and BUSDAQ. Modbus¹ is a communication protocol widely used in industrial automation devices.

The interface acts as Modbus client and can address and receive data from several Modbus server devices. It is used to integrate 3'rd party devices equipped with Modbus as additional measurement data sources into imc measurement systems and data loggers.

1: Modbus® is a registered Trademark of Schneider Automation, Inc.

Typical applications:

- Integration of external devices and sensors with Modbus interface into an imc data acquisition system.
- Extension of the capabilities of an imc system to include specific special functions or sensors that can only be covered by 3'rd party devices.
- Use of special instruments (e.g. power meters, power analyzers, laboratory instruments), sensors (e.g. humidity or ph sensors, pyrometers), sensor systems (e.g. weather station) or test infrastructure (measurement of current temperature of climatic chambers)
- Low-speed monitoring of environmental parameters and electrical power
- Use of standard equipment from the field of industrial test automation
- Using an imc system as a central platform and gateway, with recording, processing of data from a wide variety of sources (imc system, analog, Modbus, field buses) and exchange and networking with higher-level systems via CAN bus, EtherCAT or XCPoE.

Features:

- Dedicated processor avoids use of resources of the main processor on the imc system and ensures performance and scalability
- Both protocols and interfaces (physical layer) that are standardized for Modbus are supported: "*Modbus TCP*" (100 Mbit ethernet) and "*Modbus RTU*" (Serial interface - RS232, RS485 half duplex and full duplex)
- Both hardware interfaces are provided on the module (RJ45 and DSUB-9) and can also be operated together, in parallel
- Device-based integration into the measurement system allows the use of all advanced capabilities and functionalities such as live data analysis with imc Online FAMOS, integration into real-time test automation (imc STUDIO Automation) etc.
- Acquisition of input data (measurement data) from Modbus devices, no output via Modbus (no control of e.g. actuators, controllers, etc.)



Reference

See also

Further information can be found in the technical data sheet of the imc Modbus interface.

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Function
Hardware: Module: LVDT16	No measurement ranges were offered for selection.
Hardware: imc CRONOSflex	An internal error (9934) was corrected, which occurred in very rare cases in consequence of repeated triggering.
CAN-Interface	- In spite of only moderate demands on the CAN-node, the error 5101 (aggregate sampling frequency of CAN-channels too high) occurred. - CAN-Assistant For signals in the format "<i>real number</i>", it is now possible to specify a scaling-factor and scaling-offset. If they exist, the factor and offset are also included when importing DBC-files. - CAN-Assistant In a certain case, import of a DBC-file returned the error: "<i>Invalid file format</i>"; error number: 21095. The DBC-file was correct, however one parameter's expected values were not complete and needed to be corrected. - XCP on CAN In certain cases, sending via XCP on CAN caused the CAN-Interface to crash. - XCP on CAN When both nodes of an interface were used for XCP, then on the second node, not all necessary messages were send.
CAN-FD	When a CAN-FD interface is operated in CAN-Classic-mode, certain very low Baud rates can not be used. For this reason, the following Baud rates are no longer available for selection: All Baud rates below 13333.33 bits/s. The following are also not available: 13377.93, 13445.38, 13468.01, 13513.51, 13559.32, 13582.34, 13605.44, 13675.21, 13722.13, 13793.10, 13840.83, 13937.28, 13986.01, 14035.09, 14109.35, 14184.40, 14260.25, 14285.71, 14311.27, 14336.92, 14414.41, 14519.06, 14571.95, 14652.01, 14705.88, 14814.81, 14842.30, 15009.38, 15037.59, 15065.91, 15094.34, 15180.27, 15325.67, 15384.62, 15444.02, 15473.89, 15503.88, 15594.54, 15625.00, 15686.27, 15779.09, 16129.03, 16161.62, 16194.33, 16227.18, 16260.16, 16326.53, 16393.44, 16460.91, 16632.02, 16771.49, 16806.72, 16913.32, 16949.15, 17021.28, 17094.02, 17204.30, 17241.38, 17429.19, 17582.42, 17738.36, 17857.14, 18018.02, 18099.55, 18390.80, 18433.18, 18604.65, 18648.02, 18735.36, 18867.92, 19230.77, 19370.46, 19512.20, 19656.02, 19704.43, 19753.09, 19851.12, 20408.16, 20512.82, 20671.83, 20779.22, 21220.16, 21276.60, 21505.38, 21563.34, 21621.62, 21680.22, 21857.92, 21978.02, 22038.57, 22598.87, 22792.02, 22988.51, 23323.62, 23460.41, 23668.64, 24024.02, 24316.11, 24390.24, 25078.37, 25157.23, 25806.45, 26229.51, 26578.07, 26936.03, 27027.03, 27118.64, 27586.21, 27874.56, 28368.79, 28673.84, 30188.68, 30651.34, 30888.03, 31007.75, 32258.06, 32520.33, 32653.06, 32786.89, 32921.81, 33898.31, 34042.55, 34482.76, 35555.56, 36036.04, 36866.36, 37209.30, 37735.85, 39024.39, 39408.87, 42553.19, 43010.75, 43243.24, 43715.85, 45197.74, 45977.01, 46511.63, 48780.49, 50314.47, 51612.90, 54054.05, 55172.41, 56737.59, 62015.50, 64516.13, 65040.65, 65573.77, 67796.61, 68965.52, 75471.70, 85106.38, 86021.51, 91954.02, 93023.26, 97560.98, 108108.11, 129032.26, 131147.54, 135593.22, 137931.03, 150943.40, 170212.77, 186046.51, 195121.95, 216216.22, 258064.52, 275862.07 Notes on compatibility: When loading any experiment for which one of the rates mentioned is entered, please make a different selection from among the correct rates.

Area	Function
XCPoE-Interface	When the frequency of transmitted XCPoE packets was high, packets could go missing due to an overload of the XCPoE interface. The interface's performance has been optimized so that now up to 10k packets/second can be processed.
imc CANSAS modules	Under some circumstances, adjustment of the Baud rate of multiple imc CANSAS modules no longer worked: upon configuring, a warning immediately appeared, indicating that a module was no longer found.
imc Online FAMOS	The sampling interval of a imc Online FAMOS channel was not modified when the sampling rate was changed in the imc CANSAS-dialog.

3.6.3.2 Firmware imc DEVICEcore 3.6 (R2)

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Function
imc EOS	• If there was an outage of the power supply to an imc EOS device while it was running, the LED shined red continuously. Now it flashes again, which is the correct behavior. • The pre-defined curve window color (channel configuration) was not applied correctly in the curve window.

3.6.4 Setup and Device Control



Balancing of all active channels

A new menu item is available, by means of which you are able to balance all active channels. This applies any settings which have been set on the Setup page "Channel balance".

Ribbon	View
Home > Balance	all
Setup-Control > Balance	Complete
Panel-Control > Balance	Complete

Notes on compatibility:

This menu action is not automatically contained in existing views. If you wish to continue using your revised views, you can incorporate this menu item by means of the menu ribbon customization.



New measured values also on other pages by means of the Current value column

The column of Current values now offers an overview of fresh measured data also on the Setup pages "*Variables*" and "*GPS*".

Notes on compatibility:

This column is not automatically included in existing views. If you wish to continue using your revised views, you can incorporate this menu item by means of the column arrangement.

Optimization of the instantaneous value display

Display of instantaneous values has been optimized to prevent constant flickering of the value display.

The following behavior has been implemented:

- The display of the value depends on the measurement range (or display range). If the measurement range is large, only a few decimal places are displayed. For example, if 50 V is the setting, then μ V-values are normally not interesting.
Thus, when a range is defined, the value range is limited to 5 digits (from the range).
Example: The range is ± 10 V $\rightarrow$ xx,xxx
 - Value: 12.34 mV
 - Readout: 0.012 mV
- There is no conversion of the unit if the unit is expressed in quotation marks:
 - 0.2 kN $\rightarrow$ 200N
 - 0.2 "kN" $\rightarrow$ 0.2 kN
- If the range is not known, then a maximum of 4 decimal places are displayed:
 - 1.2345678 V $\rightarrow$ 1.2345 V
 - 0.1234567 V $\rightarrow$ 123.45 mV
- If no unit is defined, the exponent notation is no longer used:
 - 12345678 $\rightarrow$ 1.2345
 - 0.0012345 $\rightarrow$ 0.0012
 - 123456.78 $\rightarrow$ 123456



Input ranges rounded

Use of taring or the entering of a value for the "*Sensitivity*" easily cause the generation of input ranges having very many decimal places. In order to keep a good overview, the display of the input ranges is rounded off to 5 significant digits.

When different channels have very similar scaling, then multi-selection can be used to select a input range which, due to rounding, will now be displayed in the same way.

Parameter sets and channel parameters still retain the original value.



Storage of measured data: Data volume reduced

The imc3-format's data volume has been substantially reduced for low sampling rates.

In the new imc3-format (under imc STUDIO 2022), data measured at a sampling rate of 20 Hz, for example, generated 16 times the data volume compared to the imc2-format (under imc STUDIO 5.2). High sampling rates were not as strongly affected.

Background:

Internally, a header is inserted into the file at regular intervals. This header ensures that the data captured up to the moment of the last header can be loaded, even if the file had not been closed correctly.

At low sampling rates, this header is entered too often. Now the system adapts to the sampling rate.

In consequence, the files are still larger than in imc2-format, but only slightly.



Renaming Setup parameters

Some parameter names have been corrected:

Incorrect name - german	New name
Shunt Kalibrierwiderstand	Shunt Kalibrierwiderstand
Automatischer Filter-Faktor	Automatischer Filter-Faktor
Sensorversorgungs-Polarität	Sensorversorgungs-Polarität
Incorrect name - english	New name
sensitivity	sensitivity
associated	associated

See also the other renames on page "[Curve properties](#)" .

Notes on compatibility:

When designations of parameters are changed, modifications are necessary if these parameters are used in a "*Parameter set file*". If you import existing parameter set files containing these parameters, please revise these files, replacing all instances of them using a text editor.

3.6.5 Inline Analysis - imc WAVE Vibration



Human vibrations with more functions

"Human vibrations" has been renamed since more filters have been added. New name: "Filter rms".

Parameter	Description
Time-weighting	The parameter "Time-weighting" has been expanded: • previously available selections: "F" (Fast), "S" (Slow) • newly added: "I" (Impulse), "Peak", "Leq from start" and "Leq in interval"
Frequency-weighting	The parameter "Frequency-weighting" has been expanded: • The filters "Low-pass", "High-pass", "Band-pass" and "Band-stop" have been added If one of the filters is elected, it is possible to additionally set the following parameters: "Characteristic", "Order" and "Cutoff frequency".
Diff./Int.	New parameters: • Differentiation and Integration "Diff./Int."

3.6.6 Panel and Widgets



Automatic display range for Widgets

The Widgets apply the channel's measurement range as the display range. See the detailed description under "[General changes](#)".

Optimized scale range

The Widgets: "Potentiometer" and "Standard meter" have been improved

If the measurement range is specified by the variable, the Widget adjusts the edge-ticks in such a way as to display "optimum" numbers.

This is especially advantageous in cases of taring, when odd ranges occur.

Example: For a range of "-97...103", the scales are rounded up to "-100...120".

The count of decimal places is also automatically adjusted.

Exception: When the range is entered manually in the Widget, the exact values entered are used. The count of decimal places can then also be modified.



Curve window colors on the dialog-page

The curve window colors can be configured differently for the display/operation pages and for the Report pages. Typically, the result should appear the same whether in the printout/PDF or in the monitor screen display.

For the printout/PDF-results of a dialog-page, however, the printer colors were used and not the monitor screen colors.

The colors are now used as follows:

Page	Colors
Dialog-page	- on monitor screen: screen color - in the printout: screen color
Report-page	- on monitor screen: printer color (The Report-page is designed for printout or PDF. Consequently, the printer colors are displayed here.) - in the printout: printer color

Notes on compatibility:

This affects existing experiments. Since the correct colors are now used, the result of a printout can appear different.

Curve window colors on the Report-page

When curve windows were copied from Dialog-pages to Report-pages, the colors usually were not suitable for a white Report-page.

New curve windows are set so that the global colors are used for the printout. Furthermore, the background is always white, even when a different color is set.

Notes on compatibility:

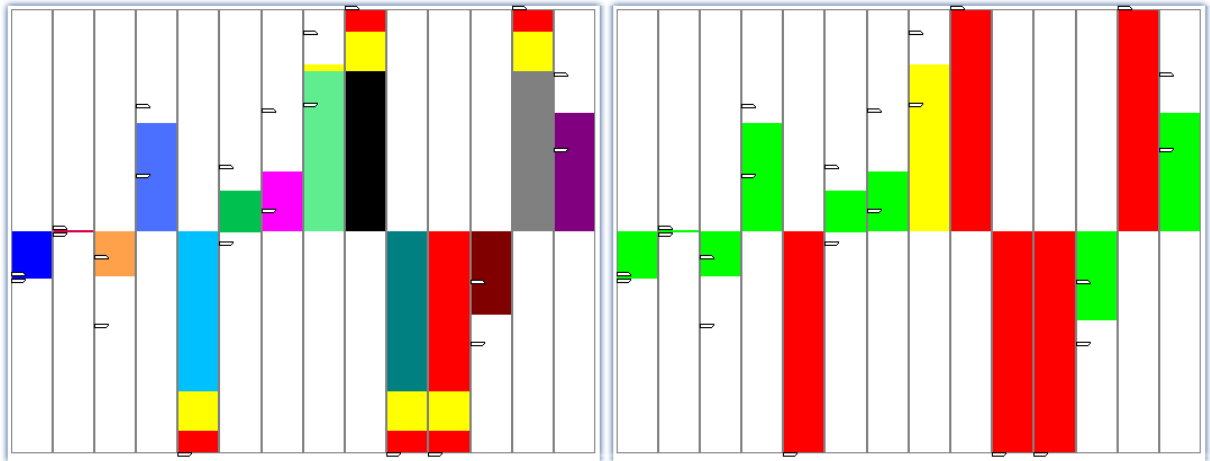
This does not affect existing curve windows. Their colors remain as they are.



Widget "Level indicator" has clearer design

By means of the Widget, overmodulation of a channel is more quickly recognized. Toward this end, the color must provide an indication that overmodulation has occurred. To make this easier to recognize, the different colors for channels have been eliminated. This makes any overmodulation stand out more clearly.

Additionally, under each bar the associated channel name is displayed.



*At left the previous color profile - At right the new color profile
Any overmodulation can be recognized immediately*

Notes on compatibility:

Any existing level indicators now apply the new design.

3.6.7 Variable management

Complex variable types are supported

Complex data with

- Real- and Imaginary parts or
- Magnitude and Phase.

Segmented complex variables, e.g from the imc FAMOS-function [ComplexSpectrum](#) are still an exception.

Time-stamped imc FAMOS-results are supported

With imc STUDIO, it is now possible to load time-stamped imc FAMOS-results, e.g. results from SearchLevel-calls.

3.6.8 imc STUDIO GoPro



imc STUDIO GoPro enables the capture of video data using the GoPro video camera.

The camera is connected via Bluetooth and WLAN with the controlling PC on which imc STUDIO is running.

The GoPro-plugin includes a remote control mechanism for the camera. Video data from a GoPro and measurement data from imc measurement devices can be captured and saved simultaneously.

The video data are captured by the camera and saved in the camera. After conclusion of the measurement, the video file is downloaded automatically. This process often takes as much time as the capture itself.

During its capture, there is no live transmission of the video image. Only after the measurement is it possible to analyze the video (e.g. using imc FAMOS) in parallel with the measured data.

Since GoPro works independently, direct synchronization of the video data with the imc measurement device is not possible. There is always a small offset which varies with the particular measurement and camera type and which can not be determined automatically. For purposes of synchronizing the video data with the measured data, it is possible to use the imc FAMOS Video-Kit, for example.

For imc STUDIO GoPro, separate licensing is required accordingly.

3.6.9 Powertrain Monitoring



Powertrain Monitoring again available

This component can be activated via the Product Configurator.

imc STUDIO Powertrain Monitoring has been developed in cooperation with the company **GfM (Gesellschaft für Maschinendiagnose mbH)** for power train diagnostics. For Powertrain Monitoring, an extra license is required, which is available from imc Test & Measurement GmbH. It can be combined and run with various baseline-editions of imc STUDIO.

3.6.10 Scripting / API



The following new capabilities are available

- By means of Scripting and imc API, a imc Online FAMOS-source text can be imported/exported.
- By means of imc API, it is possible to request imc STUDIO-version information, as well as the installation and application folder paths.
- In the Scripting, access to logbook entries is now possible without calling the "GetAPI()" method. The class "LogbookEntry" is now available directly.

3.6.11 Performance



Performance improvements and problem solutions

- High-speed TSA-data now require less CPU computational power.
- The continual increase of working memory demands along with increased channel count has been corrected.
- Curve window: Non-existent channels linked to a curve window caused substantial time demands upon selecting a measurement in the Data Browser, even though the curve window was linked with "Current Measurement" and no data were loaded.

3.6.12 imc STUDIO Monitor



The first version of imc STUDIO Monitor 2023 is available. See the separate document: "*What is new*" for imc STUDIO Monitor.

imc STUDIO Monitor is now a stand-alone product with separate licensing, and no longer a supplemental package for imc STUDIO Standard, Professional or Developer. Thus, in order to operate imc STUDIO Monitor no additional imc STUDIO license is required any longer.

Many functions have not yet been implemented and will undergo further development in subsequent versions.

Currently available:

- All channels/variables belonging to the selected device return data.
- The channels/variables can be dragged to the Panel and displayed there while the measurement runs.
- Values can be written to variables in imc STUDIO Monitor - e.g. Display-variables.
- The configuration can be saved/loaded.

The following functions are not yet implemented:

- Saving of the measured data.
- Reaction to changed device configuration: When the configuration is changed in imc STUDIO, the device must be re-selected in imc STUDIO Monitor.
- Views adapted to imc STUDIO Monitor: At this time, all views available in imc STUDIO are used.

3.6.13 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Fieldbus-channels	When the Fieldbus-channels were captured as xy-data sets, the circular buffer for data display was sometimes not calculated correctly. Once the circular buffer was full, it was completely emptied. The circular buffer is now again correctly filled according to the FIFO method.
Setup - device control	• The display of Current values failed to display any values in various cases, or stopped updating the values. • When transferring the device configuration to a different device, the suggested address of the modules was offset by one address in some cases. Module number 0 should be Module number 1, and 1 should be 2 etc. • The metadata column "<i>Image</i>" no longer showed any preview in the table if an image was linked with it. • When the properties for either the module or the device were open while the device was connected, then various error profiles appeared upon closing the dialog. • The software version of the device does not match that of the PC! • Data storage error in imc Online FAMOS. • The device is not parameterized.

Area	Description
Data type: Reduced-data channels	Reduced data channels, such as the results of the function "TransRec" or DI-port-compressed channels, can not be used in imc STUDIO. For this reason, the following modifications have been made: - imc Online FAMOS-results of the function "TransRec" and DI-port-compressed channels are blocked from transfer to the PC. - When loading an old experiment with the affected channels, a message is posted which indicates that transfer to the PC is not possible. - The function "TransRec" is no longer offered in imc Inline FAMOS.
Data storage of imc Inline FAMOS-channels	"Save trigger events in individual files": A triggered, calculated imc Inline FAMOS-channel was incorrectly saved. Each event was assigned a new measurement folder with the extension .002/.003/... Now, as with other channels, a new trigger folder located under the measurement folder is used.
imc Inline FAMOS	- After loading an experiments from Version 5.2, an imc Inline FAMOS-task would not recognize its own virtual channels. It was necessary to perform "Apply" to the source text one single time. - When the system detected a circular dependency among multiple imc Inline FAMOS-tasks, start of the measurement was not prevented. Now the start is again canceled if circular dependency is detected. - When the system detected a circular dependency among multiple imc Inline FAMOS-tasks, a pertinent message is posted. This message now provides information on which task and which channel is affected. - imc Inline FAMOS occasionally started with a delay of 0.2 s to 1 s after start of the device. - When comparing channel values with one value by means of the "Equal"-function, it returned incorrect results. The result varied between 0 and 1072693248, even though it should have been 1. - imc STUDIO crashes when the following settings have been made: - in imc Inline FAMOS, a virtual channel is created using "CreateVChannel" - the value for "CreateVChannel" is read from a pv-variable which had been created in imc Online FAMOS.
imc Inline FAMOS and imc Online FAMOS	Previously, when values were written to static vector elements in the OnInitAll, OnMeasureStart or OnMeasureEnd blocks, the calls were ignored and not executed. Now, pertinent error messages are posted, since the system's ignoring of the situation had caused irritation for users. The same applies when calling the functions SingleValueChannels or VectorChannelSet in these control commands.
Data Processing	Directly after loading an experiment, there were no Data Processing-channels presented in the Data Browser. They were only presented once the action "Prepare", was performed, for example. Among other things, Data Processing-channels can be channels of results from imc Inline FAMOS, Inline Analysis and Bus Decoder. Now these channels are present directly upon loading the experiment.
Automation	- When an error was detected upon processing the configuration for a Automation task, the bug location was no longer indicated in the Editor. - imc Online FAMOS did not accept pv-variables as a vector-index. Thus it was not possible to use any loops having persistent counters in the Automation.

Area	Description
Panel	- Panel pages could not be exported to the Clipboard via the context men. - Accommodating the Panel page to the available window size has been improved. The page is still exactly as large after modification as a new page. Previously, depending on the resolution it could be either too small or too large. When multiple monitors were used, the resolution of the main monitor was used for the purpose of determining the target size. Now, the system correctly uses the resolution of the monitor on which the page is displayed.
Widgets	Widget Table: - When the "<i>Checkbox</i>" was activated as the Editor in cells, the checkbox in the cell was displayed incorrectly: the checkbox was on the right side of the cell and on the left the value was still displayed additionally. Now only the checkbox is displayed, in the center of the cell. Curve window display in the "<i>Table</i>"-format: - The table no longer scrolled automatically to the new value.
Tool window selection	In the expanded view of the dialog " <i>Tool window chooser</i> ", some entries had no names.
Project management	- Import of project-export-files from Version 5.2 - The measured data were not found, - when a dot was present in the project name or - when the project was renamed upon importing. - When a project is imported, the experiment templates are also converted. For this reason, when a new experiment is created, there is no longer any notification that the experiment originates from an old version of imc STUDIO. - When an experiment is transferred to a different device, the newly created experiment is now set up in the project in which the original experiment is located.
Variable management	- Variables created by means of "<i>Load variable</i>" returned an error message if a different experiment was loaded or a new one was created. - The variables "<i>Disk size</i>" and "<i>Free memory</i>" always returned the value 0 bytes. The free memory space and the size of the storage medium are now displayed again.
Commands	Set variables: - When a space or tab-character appeared after the number in the column of values to set, an error was reported. Now these characters are ignored again, as in Version 5.2. imc FAMOS command - When opening imc FAMOS via the dialog, the values of integer pv-variables were not passed. Now, the variables take the correct value.
User-defined events	In some cases, user-defined events would no longer trigger after having been triggered multiple times.
Performance	- The required volume of private memory for the time-stamped CAN-Fieldbus data has been optimized. There is no longer any continual increase. - Automation: The event "<i>imc FAMOS Automation Data Cutting</i>" caused very high demands on the CPU.
Deinstallation	Deinstallation failed to remove the imc STUDIO symbol from the desktop, as well as all the entries in the Start Menu.
API	In the API, a collection of constants is now available for default responses to dialogs (UserRequest).

3.7 Update-notes and compatibility from 2022 to 2023

If you plan to update from Version 2022 to 2023, there are a few things which you may need to observe regarding any existing databases. In particular, be aware of the following points:

Area	Function
Setup	Certain parameter-names ^[64] on the dialog: "Curve properties" have been modified.
Widgets	- Modification is necessary if the display range of a Widget already used a channel's measurement range ^[64] as the range boundaries for the scales. - The colors of the level indicator ^[76] have been revised.
Panel	Upon exporting Dialog-pages ^[75] , the curve windows now use the screen colors and no longer the printer colors.
Reduced data channels	Modified treatment of reduced data channels ^[79] , such as the results of the function "TransRec" or DI-Port compressed channels.
Sequencer	Discontinued: Sequencer command " Transfer device settings " ^[62]
imc EOS	It is not possible to load the device configuration of imc EOS devices from version 2022 into version 2023. When an experiment containing an imc EOS device is loaded with imc STUDIO, the system automatically de-selects that imc EOS device. In such cases, the device needs to be re-selected (manually) and a new configuration must be created for it.



Notes

Update from Version 5.2

If you perform an update from Version 5.2, please also observe

- the [update notes on version 2022](#) ^[131] and
- the [the missing components and functions to version 5.2](#) ^[15].

4 imc STUDIO 2022

4.1 Introduction

The imc STUDIO 2022 you now possess is a version which is updated to the newest level of PC technology. This version of imc STUDIO is designed for 64-bit computer architecture. For this purpose, many key components have been updated, revised or even redesigned from scratch. We have invested much time in improving functions, simplifying workflow procedures and achieving greater system stability. The outcome is a modernized system architecture which provides substantial improvement of performance. To mention a few points up front:

- imc STUDIO is now a multi-threading capable 64-bit version,
- thanks to the new device firmware imc DEVICEcore, communication with and control of the new devices such as imc EOS is many times faster.
- the display in the curve window is substantially more powerful and smooth.
- ...

On the following pages, you will find an exact enumeration and description of the changes. There you may find quite a lot which will be pertinent to your work.

In particular, you should read the chapter "[Update-notes and compatibility](#)" ^[131] before performing the update. It presents all the functional changes and modifications which need to be observed when updating.

The imc team wishes you total success in accomplishing your measurement tasks with imc STUDIO.

4.2 imc STUDIO 2022 R3

4.2.1 General Changes in imc STUDIO



Accessible introduction via the homepage

It is now possible to obtain tutorials and the manuals for the system directly from the homepage. This makes quick familiarization with the system easier to find.

As well, the manuals for the hardware and other imc-products are available directly on the homepage.



Personal metadata in the Experiment/Meta-folder

For the purpose of saving your own personal files pertaining to the experiment, the folder "*Meta*" can be used. Previously this had been a rather hidden feature, since this folder need to have been created first. Now, the "*Meta*"-folder is automatically created in the Experiment when "*Save*" is performed or when creating an experiment using "*New*", unless this folder already exists. Along with this, a *readme.txt* file is also created, which describes the folder's function.

As previously, the folder is always exported along with the experiment. What is new is that it is also imported even when no measured data are imported. Previously the folder was only imported when the measured data were also included in the import.

For example, it is possible by this method to save characteristic curves, target value tables, CCV-files or reference data, for instance for the ChannelLoader .



Selecting the data format: imc2 or imc3

By default, imc STUDIO saved the measured data in the imc3 format. In imc FAMOS, it is possible to set whether to save the files in either the old imc2 or the new imc3 format. imc STUDIO now also applies this setting. We continue to recommend saving the measured data in the imc3 format.

With which version and which device were the measured data generated?

The saved measurement files record with which version of imc STUDIO and with which firmware/3rd-party device/DataProcessing and which device the measurement was performed. For this purpose, the *.raw-file can be opened with a text editor. This info is readable whichever data format (imc2 or imc3) is used.

4.2.2 Setup and Device Control



Display of instantaneous values for 3rd-party channels, incremental counters, device-variables etc.

The display of instantaneous values in the Setup now also includes indication of the current readings of the following devices/channel types:

- incremental counter inputs, fieldbus channels, FunctionSimulator-channels, Application module-channels, GPS-channels
- pv-variables, display variables
- ethernet-bits, virtual bits

The current reading is displayed as long as the channel is returning measured data. If the measurement is not running, the last reading is retained and displayed in gray font. This makes it clearly distinguishable which value is still being updated and which value may be obsolete.

Exception: For channels having an associated pv-variable (e.g. analog channels or incremental counter inputs), the following still applies:

- The current value is displayed as soon as the action "*Prepare*" is performed (so also before and after the measurement).

Name	Status	Current value	Measurement mode
Channel type: Analog inputs			
Channel_001	Active	0.00951138 V	DC - Linear
sin3	Active	-0.00536171 V	
Channel type: Digital inputs / outputs (bits)			
Channel type: Digital inputs / outputs (ports)			
DOut001		0	
DIn002	Active	0	Sampling
Channel type: Display variables			
DisplayVar_01		12	
DisplayVar_02		123	
.....		0	
Channel type: Incremental counter inputs			
Counter_001	Active	0 m	Distance (diff.)
Channel type: Monitor: Analog inputs			
Channel type: Process vector variables			
pv.Counter_001	Active	0 m	
pv.DIn002	Active	0	
pv.Channel_001	Active	0.0080495 V	
Channel type: Virtual bits			

Display of instantaneous values for various channel types

4.2.3 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.15 R3](#) 
- [Firmware imc DEVICEcore 3.5 R2](#) 

4.2.3.1 Firmware imc DEVICES 2.15 R3

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
CAN-Assistant	• The system's behavior when importing CBA-files having more than one node has been improved. The settings can be loaded to the selected node individually. • In the CAN-Assistant, pv-variables generated by other fieldbusses such as LIN are now also available as send-channels. OBD2-ECU Protocol • In the CAN-Assistants, additional PIDs conforming to the standard SAE J 1979DA:2021-04-21 have been implemented for the OBD2-ECU protocol. • In the CAN-Assistant, it is now possible to enter user-defined PIDs with the OBD2-ECU protocol. • The graphical illustration of the message mapping has been improved. With a message length of more than 8 bytes, the first 8 bytes are displayed correctly. CAN-Assistant - A2L • In some circumstance, after importing an A2L, the CAN-Assistant could display duplicates of an event. This was reported as an error upon running the syntax check. • When importing A2L files, it was only possible to search for labels in the A2L import dialog a few times. After that, the list of labels remained empty.
CAN- and XCPoE-Assistant	In the CAN- and XCPoE-Assistant, the maximum count of events and DAQ-lists supported has been increased to 40.
CAN-FD interface with imc CRONOScompact device	Performance improvements regarding the CAN-FD-interface, which reduce demands on the system.
imc Online FAMOS	The syntax check which runs upon reading values from a CAN-message has been optimized.
CRONOS-PL\DIOINC CRONOS-PL\ENC-4	With the DIOINC- and ENC-4 boards of the imc CRONOS-PL device family, in the mode " <i>Angle (abs)</i> ", the angle was indicated incorrectly, since the scaling " <i>Imp/revolution</i> " was not calculated correctly.
CRFX\HISO-8	At slow sampling rates (below 2 Hz), incorrect offsets were generated in 16-bit mode.

4.2.3.2 Firmware imc DEVICEcore 3.5 R2

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Calibration date	The calibration date is now displayed correctly for imc EOS-devices.
Data saving	Renamed channel names were not always correctly allied in the filename.
Synchronization	The synchronization status was not reset correctly if one of the following occurred after successful synchronization: • the connection to the device was disconnected, or • a new experiment involving the same devices was set up.

4.2.4 3rd-party devices



fos4X - Data storage of the fos4X-channels has been revised

Previous behavior:

fos4X-channels were previously saved as equidistantly sampled channels. The time stamp of the first sample returned was used as the starting time. The time stamps of any subsequent samples were ignored since it was assumed that the samples would arrive at the specified sampling rate.

This mode is now replaced with two new procedures. You can now **toggle** between **time-stamped data** and **equidistant data** (resampled).

Background:

With long-duration measurements, it can occur that the data do not arrive at exactly this rate. Deviations by as much as 0.01 per mil have been observed. This produces noticeable effects when the measurement duration is long. For this reason, the exact time stamp is important.

If you record data with "Time stamp", it is possible to obtain an equidistant channel by resampling with imc FAMOS, for instance, during post-processing after the measurement.

In order to avoid needing resampling, the mode "Sampling rate" is provided. Here imc STUDIO performs the resampling directly during the data are recording. This compensates for the possible slightly deviating sampling rate.

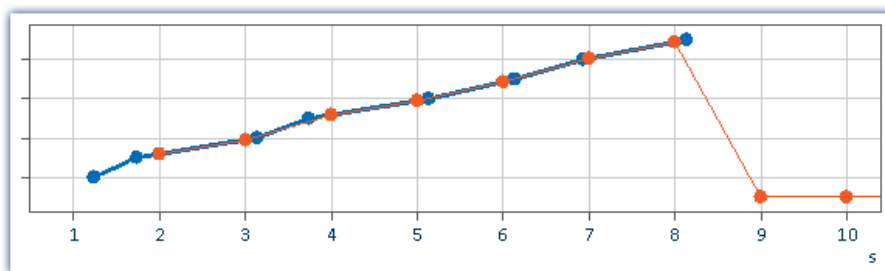
X-axis: Time stamp

- The time stamps provided by the 3rd-party fos4X device are saved. The measurement duration of time-stamped channels is limited to 800 days. Additionally, they require more memory space. The precision of a time stamp is 256 ns.
- The sampling rate set is also required for sending the requests to the fos4X-device. This is the rate at which you want to receive the data.

X-axis: Sampling rate (equidistant data)

- The data stream starts at the next full second on the clock after arrival of the first sample. The system performs linear interpolation between the values returned at the sampling rate specified. Adjacent to any error fallback values, calculation of the interpolation applies the error fallback value.

Example with exaggerated offset to illustrate:



Parameter "X-axis" set to Time stamped (blue) or Sampling rate (orange)
Values at 9 s and 10 s: error fallback values

fos4X-data with time zone information

fos4X-data are now supplied with the information that they have been recorded in UTC. This ensures that the data are displayed stacked at correct reference to time in mixed operation with imc DEVICES- or imc DEVICEcore-devices, and thus can be subjected jointly to calculations.



The 3rd-party device "*FunctionSimulator*" can be used in all editions

The 3rd-party device "*FunctionSimulator*" is now available in two variants. On the one hand as a template, as previously also for editing and with a corresponding license. And on the other hand as a complete 3rd-party device, which can now be freely activated in all editions.

The "*FunctionSimulator*" is a device which simulated various kinds of mathematics functions, including Sine, Cosine, Triangle, Sawtooth and Squarewave. The "*FunctionSimulators*" channels appear on the Setup page under "*Analog channels*".

Name	Connector	Status
Channel type: Analog inputs (Count=8)		
Cosine	cos	Active
DC	dc	Active
Noise	noi	Active
Rectangle	rect	Active
Sawtooth	saw	Active
Sine	sin	Active
Trapeze	tra	Active
Triangle	tri	Active

Setup: *FunctionSimulator* (Analog channels)

The frequency, scaling or offset can be user-specified.

Notes on compatibility:

The template has been renamed and is now called: "*FunctionSimulatorTemplate*". The new 3rd-party device has the name of the former template: "*FunctionSimulator*".

If the old template is already in use, it is possible to continue using it. In order to use the new 3rd-party device, please first delete the old template by means of the "*3rd party device management*".



The 3rd-party device "*ChannellLoader*" provides information on the expected path of the missing data

If the file to be played back is missing, an error message now appears which provides the expected path and filename of the missing file.

The 3rd-party device "*ChannellLoader*" uses experiment-specific files

When a file is selected which is located below the Experiment-folder, the location is saved in "relative" terms with respect to the experiment. If the location of the experiment changes, the file will still be found as long as it is also in the new experiment. The file from the old experiment-folder is not us.

Example: You create a dat-file in the "*Meta*"-folder. If you now export the experiment and import it to a different device or under a new name, the "*Meta*"-folder is also present there (together with the dat-file). By means of the relative path, the copied dat-file is found and used.

Note: Other folder names can also be used. The advantage of the "*Meta*"-folder is that it is automatically included with the export or import. As well, it is included when copying with "*Save as*".

Whether the path is saved in relative or absolute terms depends on the relationship to the Experiment-folder. If the file is below the Experiment-folder, the path is "relative". If the file is outside of the Experiment-folder, the path is "absolute".

4.2.5 Inline Analysis - Overmodulation

Monitoring the overmodulation of "analog channels" (violations of the specified measurement range) as per the standard: "DIN EN 61672-1".

For purposes of display and evaluation of the overmodulation a variable is provided: "WAVE_OverloadVariable". It indicates that one measurement channel is reporting overmodulation but not which channel.

When overmodulation is detected, then for **one second** the variable "WAVE_OverloadVariable" takes the value "1". After that one second the system checks whether the overmodulation is still happening.

- if "no", the variable reverts to "0".
- if "yes", the value "1" is retained until there is no more overmodulation. Then the variable reverts to "0".

The following channels are monitored: active analog channels belonging to the firmware groups A and B (imc DEVICES and imc DEVICEcore), which are subjected **to calculations in an Inline Analysis** function. No other channels such as incremental counters or 3rd-party device channels.

4.2.6 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Widgets	• The pushbutton (Designer) appeared like an Automotive-pushbutton. The property "Background" was initially set incorrectly. • Widget: "Execute menu action": Executing the menu action via the Widget did not work directly after the configuration. • DIO (Designer): The width of the Widget was too small so that after having been created, the font could not be displayed completely. • Table: When a "Range" was set for a cell, e.g. "0; 10", an object reference error was raised. • Table: PDF-export - The values displayed in a table do not contain up-to-date values if the table was not visible at the time at which export was performed.
Kurvenfenster	• Absent channels in the curve window cause very high demands on the CPU. • Load on demand: Supposing two channels are configured in the curve window for xy-display and display the saved measurements according to their measurement number. Previously, the data were not automatically loaded when a measurement was selected. They needed to be loaded manually. Now, channels which are displayed as xy channels are also loaded automatically. • The order of the channels in the free-floating curve window was mixed up when multiple channels were displayed simultaneously. • Shifting effects occasionally occurred in the display when other Widgets were present along with a curve window. The curves were then distorted at the height of the upper/lower edge of the other Widget. • Curve window selection: The list of curve window display variants has been revised. ○ Changes: "Standard maximized" has been eliminated "Polar plot" has been added ○ Renaming: "Last value as number" renamed to "Numeric" "Waterfall diagram" renamed to "Waterfall"
Panel	When a page is locked, a padlock symbol appears. Outside of Design-mode it was too large and consequently made a scroll bar necessary in the Panel page.

Area	Description
Rights management	The access privilege " <i>Exit fullscreen mode</i> " now prevents exiting of fullscreen mode even when it is set to " <i>hidden</i> ". " <i>hidden</i> " and " <i>disabled</i> " are now identical in behavior.
Setup - Performance and memory demands	- When changing a parameter of very many channels simultaneously by means of multi-selection, it took a long time until the change was applied. Now there is no longer any delay. - Optimization of memory demands for time-stamped channels. Having many time-stamped channels caused data points to stop arriving in spite of a very low data rate.
Setup - Device control	The action " <i>Prepare</i> " for the measurement reset the DOs to 0.
Setup - Firmware imc DEVICEcore	When the imcDevices2x-plugin was deactivated, the time zone information of the VRTC could no longer be obtained. In consequence, the start time for " <i>Automatic timed start</i> ", could be converted to UTC incorrectly for imc DEVICEcore-devices, for example.
Setup - Device-Assistants e.g. fieldbusses, OFA, ...	- The dropdown-box for device selection has been eliminated. Instead, all device tabs are displayed from the beginning. - After clicking on the Exit-button within an embedded Assistant, the entire dialog for all devices closes. - Minimizing an Assistant also minimizes imc STUDIO. - Text improvements of the tool tips on the menu items for calling a device-Assistant. - Saved fieldbus bits could often not be displayed in the curve window. - When a channel name collision occurred, e.g. due to different device-Assistants, the error message which appears now specifies exactly which channels are affected and to which Assistant they belong. - When the problem of duplicate channel names was resolved, then after "<i>Prepare</i>", in some cases the error "<i>Variable "<HWID>" does not exist</i>", would appear, even though all settings had been made correctly.
Setup - FunctionSimulator	- In the FunctionSimulator, when one channel had a defined measurement duration, but others did not, then after elapse of the measurement duration the error message "<i>Error in WriteData (Result = OpenExpected)</i>" was posted cyclically. - FunctionSimulator-script: In the build of 3PDI-templates, there was a warning due to the target platform (x86). The target platform has been modified for the templates. Manual installation of ".NET 4.8 SDK" may be necessary.
Setup - fos4X-Blackbird	Entering sampling rates which are not supported caused incorrect statements in the saved data. For instance, if 20 Hz was entered, a corresponding message was posted in the logbook. The device would work correctly at 50 Hz, however 20 Hz was entered in the saved file. Now during "<i>Prepare</i>", the value is automatically corrected and the new value also appears with the measured data.
Setup - 3rd-party devices	For 3rd-party devices within the system, the display of the serial number and device specs has been revised to provide a uniform appearance and unique identification.
Bus Decoder	- When changing the fieldbus configuration and thus generating a new channel for the Bus Decoder, the Bus Decoder reported an error upon attempting to check the configuration. - A CAN-protocol-channel containing digital channels incl. bits could not be extracted by Bus Decoder. Upon checking the configuration an error was reported: "<i>CAN_Messages_S1_K1: Error in Configure(): Invalid Blob.</i>".

Area	Description
imc Inline FAMOS	- Writing values to integer-pv-variables via imc Inline FAMOS caused the error: "<i>Error writing the single value!</i>" - Segmented results channels could not be subjected to further calculations in any other imc Inline FAMOS-task. - The measurement did not stop correctly when it was closed, during data saving and when imc Inline FAMOS-calculations were running. - Data storage: When the data stream is interrupted, e.g due to power outages, the files of measured data leave gaps. Event-based files are generated in consequence. Each event has a time-reference expressed as an X-offset (X0). In imc Inline FAMOS channels, this had not been set correctly and was always assigned the value "0". - Multiple data storage deletions closed - failure to perform appropriate cleanup upon accepting the source text entered.
imc Online FAMOS and imc Inline FAMOS	- The function "<i>RecordEvent</i>" generated either no units or incorrect ones along the time axis. Now "s" is displayed correctly in both cases. - The description of the function "<i>NOT</i>" has been expanded: Notes were added to indicate that applying the function to expressions such as in "If NOT(pv.x > 0) = 0" does not return correct results.
Data storage	- It had not been possible to save more than 509 channels on the PC simultaneously. This limit has been eliminated so that from imc STUDIO's side there is no limitation on the channel count. - The offset for Y-data in XY-data was always set to 0. In consequence, for saved data of this type an incorrect amplitude was displayed in the curve window. - Fieldbus bits, e.g. CAN-fieldbus bits had no unit (s) along the time axis.
Option: Storage location measurement data	- When a valid base path for storage of measured data was entered, but which did not yet exist, the path was not created and start of the measurement was canceled. Now the folder is created whenever possible. - The placeholder <STORAGE.MEASUREMENT> returned an incorrect time.
Automation	- An error in the Automation-component caused unexpected error messages not directly traceable to the error. For instance, an error was reported according to which the ramp function only supports Integer values, even though the function correctly supported Integer values. This problem is fixed. Find and Replace: - Skipping to the search results no longer worked. - Replacing the search results only replaced a small number of search results.
Inline Analysis	- Deletion of Inline Analysis-functions has been revised. For instance, if the last Inline Analysis-function was deleted, no internal cleanup was performed. The calculations deleted in this way were still present upon the next start and returned data. Similar problems also occurred when deleting devices on whose channels calculations were performed. The functions had only been deleted from the tab "<i>Inline Analysis</i>". - The channels of the Inline Analysis-functions, based on imc Inline FAMOS-channels, were no longer listed after the action "<i>Prepare</i>". - The interplay between Inline Analysis and imc Inline FAMOS has been revised. In some setup combinations, errors regarding invalid trigger names were reported even though the configuration was correct.

Area	Description
Commands	imc FAMOS - When a not (yet) existing variable was passed to imc FAMOS, a warning was posted. Normally this warning would not be desired because upon the first evaluation there would be no results channels, for example. Any results would only be available after the second evaluation. For this reason, no warning is now posted (this matches the behavior in Version 5). - Each time the imc FAMOS-command transfers a result to imc STUDIO, as a result of which an existing variable was overwritten, the category of the variable was changed from "<i>User-defined</i>" to "<i>imc FAMOS</i>" or vice versa. - By means of the imc FAMOS-command, a display variable is written which is then transferred via CAN. If the imc FAMOS-calculation returned the same value to which the display variable was already set, the value was not transferred correctly via CAN. Although the display variable had the correct value, CAN transferred a "0". User-defined characteristic curve - With a default-value for "<i>Delay</i>" of "0.0", the command could not run. Previously, only whole numbers were allowed; now also decimal numbers are allowed, so that this default-value will be accepted. E-Mail - Files were blocked if they were sent with the command "<i>E-mail</i>".
Load Variable	When an event-based channel is loaded for which the events have different specified sampling rates, import is now denied. These are not files which can be created in imc STUDIO or which imc STUDIO can handle. Previously, the channels would be imported, but then they would have incorrect axis settings.
Scripting	When creating new scripts, upon first compiling them warnings would be posted regarding a processor architecture conflict. Manual installation of ".NET 4.8 SDK" may be necessary.
API	- In the API, the constructor has been revised so that the obsolete LicenseAccessKeys no longer can be passed. - In the API-project, a line for the Assembly's search folder was missing.
Installation medium	imc FAMOS - The new revision is included on the installation medium: imc FAMOS 2022 R3 fos4X - The file "<i>fos4TV.exe</i>" has been updated on the installation medium. All other files have been deleted and are available on the imc homepage. System - OS-Update: In order to avoid any problems with obsolete signatures and security holes, the previous ".NET 4.8-Framework" has been updated on the installation medium.
Installation	Changes to the installation: - When selecting the "<i>Demo</i>" installation variant, imc WAVE is now also selected and installed. - Since "<i>Shared</i>" and "<i>imc LICENSE Manager</i>" can not be de-selected, they no longer appear in the list for product selection.

4.3 imc STUDIO 2022 R2

4.3.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.15 R2](#) 
- [Firmware imc DEVICEcore 3.5 R1](#) 

4.3.1.1 Firmware imc DEVICES 2.15 R2

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
CAN-Assistant	When importing .arxml files, when the messages' names were very long, the same new name was sometimes assigned to different messages.
XCPoE-Assistant	Opening the XCPoE Assistant raised an error.
Certificates	The installation contains a new certificate. Additionally, it is available for download on the homepage. For transfer via secure https access, a certificate obtained along with the installation purchase. This certificate has an expiration and must be renewed annually.
WFT	• Balancing via imc Online FAMOS: When performing balancing using the imc Online FAMOS function RunAutoBalance, an internal data overflow occurred in imc Online FAMOS. • The balancing-interval now indicates the correct count of revolutions.

4.3.1.2 Firmware imc DEVICEcore 3.5 R1

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Access to the internal data carrier	Access to the internal data carrier in the device has been modified. By default, the entry to make for the user is "imc", and the password to enter is the device's serial number. This change was necessary because many companies had deactivated guest access without authentication as the default in their Windows OS.
Trigger	The trigger threshold was compared with the unscaled measurement range. When a factor/offset was entered, the system often incorrectly outputted that the trigger threshold was outside of the measurement range.

4.3.2 Setup and device control



Device control - Summary

A new Setup page named "Summary" has been added.

This page provides a quick overview of all active channels, the data storage status, and of the circular buffer time. Additionally, the page can be filled with any arbitrary choice of channel parameters, as accustomed.

DocumentationDevicesAnalog channelsDigital channelsSummary

Channel name	Connector	Channel status	Current value	Save (device)	Save (PC)	Circular buffer time (curve window)	Channel type
DIN002	[01] DIIn02	Active		☐	☒	1 min	Digital inputs / outputs (ports)
Channel_001	[01] IN01	Active		☐	☒	1 min	Analog inputs
Channel_002	[01] IN02	Active		☐	☒	1 min	Analog inputs
Channel_003	[01] IN03	Active		☐	☒	1 min	Analog inputs
Channel_004	[01] IN04	Active		☐	☒	1 min	Analog inputs
Channel_005	[01] IN05	Active		☐	☒	1 min	Analog inputs
Channel_006	[01] IN06	Active		☐	☒	1 min	Analog inputs
Channel_007	[01] IN07	Active		☐	☒	1 min	Analog inputs
Channel_008	[01] IN08	Active		☐	☒	1 min	Analog inputs
Mon_Chanel_001	[01] MIN01	Active		☐	☐	1 h	Monitor: Analog inputs
Mon_Chanel_002	[01] MIN02	Active		☐	☐	1 h	Monitor: Analog inputs
Mon_Chanel_003	[01] MIN03	Active		☐	☐	1 h	Monitor: Analog inputs
Mon_Chanel_004	[01] MIN04	Active		☐	☐	1 h	Monitor: Analog inputs
Counter_001	[02] CIN01	Active		☐	☒	1 min	Incremental counter inputs
Counter_002	[02] CIN02	Active		☐	☒	1 min	Incremental counter inputs

Summary - all active channels

By means of the grouping box at the top left, it is possible to use Drag&Drop to apply grouping to individual columns. Thus for instance, it would be possible to group channels according to whether or not their data are to be saved.

DocumentationDevicesAnalog channelsDigital channelsSummary

Save (PC)

Channel name	Connector	Channel status	Circular buffer time (curve window)	Channel type
Save (PC): False (Count=4)				
Mon_Chanel_001	[01] MIN01	Active	1 h	Monitor: Analog inputs
Mon_Chanel_002	[01] MIN02	Active	1 h	Monitor: Analog inputs
Mon_Chanel_003	[01] MIN03	Active	1 h	Monitor: Analog inputs
Mon_Chanel_004	[01] MIN04	Active	1 h	Monitor: Analog inputs
Save (PC): True (Count=11)				
DIN002	[01] DIIn02	Active	1 min	Digital inputs / outputs (ports)
Channel_001	[01] IN01	Active	1 min	Analog inputs
Channel_002	[01] IN02	Active	1 min	Analog inputs
Channel_003	[01] IN03	Active	1 min	Analog inputs
Channel_004	[01] IN04	Active	1 min	Analog inputs
Channel_005	[01] IN05	Active	1 min	Analog inputs
Channel_006	[01] IN06	Active	1 min	Analog inputs
Channel_007	[01] IN07	Active	1 min	Analog inputs
Channel_008	[01] IN08	Active	1 min	Analog inputs
Counter_001	[02] CIN01	Active	1 min	Incremental counter inputs
Counter_002	[02] CIN02	Active	1 min	Incremental counter inputs

Summary - grouped according to data saving

Info on compatibility: existing views are not modified automatically.

This page is not automatically present in existing views, but it can be integrated into these. To do this, open the context menu over an existing tab title and select the item "*Insert complete layout*" > "*Summary*".

Additional changes in this context:

- Old pages having the name "**-Statistics*" have been eliminated (except for "*Module-Statistics*"). These are no longer needed.
Compatibility: When an existing database is used, the pages remain present. But when the database is overhauled, the pages will no longer appear.
- The menu item "*Statistics*" has been eliminated since the new page is very conspicuous.

4.3.3 Inline Analysis - imc WAVE



Machine diagnosis

imc WAVE Vibration has been supplemented with the function: "*Machine diagnosis*" (in accordance with ISO 10816/20816).

Revision of the FFT-functions

Applicable to all Inline-analyses: "*Noise*", "*Vibration*", "*Rotation*" and "*Structure*"

Parameter changes:

- "*Bandwidth*" is hidden and instead "*Sampling rate*" is displayed
- "*Lines*" is hidden and instead "*Samples*" is displayed

Compatibility: The parameters are converted automatically. No modification of existing experiments is required.

New parameter: "*Result*"

Available choices: "*RMS*", "*RMS²*" and "*Peak*" (Amplitude)

Compatibility: Previously, "*RMS*" was the hidden default setting so that it is selected for any existing experiments. No modifications required.

New choice for parameter: "*Averaging*"

Available choices: "*none*", "*from start*", "*Number*"

New choice: "*Number*", "*from start*" has previously been named "*Leq from start*"

New parameter "*Avg.-type*"

Available choices: "*RMS*" (quadratic mean), "*Arithmetic mean*", "*Minimum*", "*Maximum*"

Compatibility: Previously, "*RMS*" was the hidden default setting so that it is selected for any existing experiments. No modifications required.

4.3.4 Panel and Widgets



Display in the curve window is substantially more powerful and smooth

The refresh rate of extensive data sets is now up to 500 times faster.

For instance, when zooming out or when sampling data at a high rate, there are very many samples in the visible region, so instead of the individual samples a reduced min/max-curve is displayed. This difference is not visually detectable. This functionality is already familiar from imc FAMOS and now also enabled for streaming data during measurement.

Prerequisite:

- equidistantly sampled channels, such as analog channels, ...
- the "symbols" for each data point may not be activated

Widget - Table (Automotive, Industrial, Designer)

The count of decimal places in conjunction with the factor has been revised. In this context, there have been a variety of changes and corrections:

- "Decimal places": "auto" has been renamed to "Automatic formatting".
- "Decimal places" offers a selection list: 0, 1, 2, 3, Automatic Formatting, Inherited from Column (only in the cell) - other numbers can be entered.
- For the property: "Decimal places", the functionality of: "Automatic formatting" has been re-defined. The value selected signifies that as many decimal places are displayed as needed to make up to 5 significant digits visible, including pre-decimal places.

Example value	0.001213141 V	0.0012 V
For the factor: "Automat..."	1.2131 mV	1.2 mV
For the factor: "micro"	1213.1 µV	1200 µV

- When the "Factor" is set to "Automatic formatting", then "Automatic formatting" is also always used for the count of decimal places, no matter what its actual setting is. For instance, if the "Factor" is inherited from the column and that column has "Automatic formatting", then any count of decimal places can appear there; the setting for the count is ignored.

Bug fix and compatibility:

When loading older experiments, the settings are corrected if

- the "Factor" had been set to "Automatic formatting" and
- the count of decimal places had been a fixed number

In this case, the count of decimal places is also set automatically to "Automatic formatting" in accordance with the new definition.

Bug fix: If "Decimal places" was set to "auto", then "one" decimal place was always shown. Now "auto" is no longer equivalent to "1". In some cases, this will cause the display of existing experiments to change. If this happens, change the setting for the count of decimal places if you wish to retain exactly one decimal place.

4.3.5 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Curve window	An embedded curve window was no longer refreshed smoothly if a free-floating curve window was displayed at the same time.
Widget - Table	- It was no longer possible to set the table's visibility in response to a variable's value. The table was always invisible if a variable was entered. - Texts were no longer displayed: Values of text variables and contents of the property: "Text".
imc FAMOS-Sequences	imc STUDIO 2022 is still not able to handle all data formats which can be generated in imc FAMOS-sequences. E.g. complex data types with real- and imaginary parts, or magnitude and phase, or even xy-data sets. The debugging has progressed to the point that imc FAMOS-sequences which generate these data types can still be run. In the predecessor version, no variable was returned once any of these variable types was present at the end of the sequence. The data types still can not be returned to imc STUDIO.
Modified data storage location for measurement data	With the modified data storage location for measurement data, a fallback-path has been established. If the target folder at the start of data recording is not accessible, the measured data are saved to the default folder. A corresponding message is posted in the logbook.
3rd- party device	Compatibility: The 3rd-party device " <i>Profinet-Sniffer</i> " has been discontinued and eliminated.
Profinet-IRT	Upon transfer to a different device, the Profinet-configuration went missing.
Profinet-Assistant	When loading experiments, in some cases a warning was posted that a new version of an external editor (e.g. Profinet-Assistant) was available. However, updating was not possible. Now the editor used (Profinet-Assistant) is no longer saved with the experiment. Instead, the editor provided with the existing installation of imc STUDIO is always used. Upon first loading the experiment with the new version of imc STUDIO, the message is displayed again one single time. The change takes effect upon saving, so that the message is no longer displayed afterward.
imc API	With the imc API, a theme name (including " <i>None</i> ") can be transferred to the constructor of the imc STUDIO-component. For " <i>None</i> ", the theme is not overwritten.
Views	Previously, three pre-configured view came with the product. The view "<i>Compact</i>" has now been eliminated, so that only "<i>Standard</i>" and "<i>Complete</i>" are still present. These views will not be deleted from any existing databases. However, they will remain in their old condition. No new functions will be embedded there. Recommendation: delete the view "<i>Compact</i>" manually from the list.
Installation	- imc WAVE 5.2 and imc WAVE 2022 can now be installed in parallel. - The names of the installation variants have been changed to make them more unambiguous. - Installation variant "<i>Demo</i>" is now called "<i>Full functionality for 30-day demo</i>" - Installation variant "<i>Auto</i>" is now called "<i>Typical functionality incl. imc STUDIO Professional</i>"

Area	Description
Security vulnerability from log4net	The Assembly for Log4Net has been updated to Version 2.0.14. Note: There is no risk due to this security flaw when used in conjunction with imc STUDIO. Log4Net is used as an element of the scripting editor, so it is sporadically loaded and used. However, this scripting-editor is a programming tool for enhancing imc STUDIO with custom functionality. It is not a web-server or any similar mechanism running in the background, which could be induced by some external request to run malware (which is the problem arising from the log4j security flaw). Furthermore, the scripting-editor has no Administrator privileges. Thus, no malware could have any effects on the system beyond the effects produced by script you wrote yourself. For this reason, there is no cause for alarm in regard to any published version of imc STUDIO to date. In this version, the assembly has been updated.
	 See also: https://github.com/advisories/GHSA-2cwj-8chv-9pp9

4.3.6 Update-notes and compatibility

If you plan to update from Version 2022 R1 to 2022 R2, there are a few things which you may need to observe regarding any existing databases. In particular, be aware of the following points:

Area	Function
Setup pages 	Old pages having the name " <i>*-Statistics</i> " have been eliminated
Widget - Table 	- Interplay between settings for "<i>Factor</i>" and "<i>Decimal places</i>" has been changed. - Decimal place count: "<i>auto</i>" no longer equates to "1".
Discontinued devices	3rd-party device " Profinet-Sniffer " 

This information is also presented in the chapter about the update from Version 5.2 to 2022.

4.4 imc STUDIO 2022 R1

4.4.1 General Changes in imc STUDIO



64 Bit

imc STUDIO 2022 has been completely converted to 64-bit and requires a 64-bit operating system.

Advantages:

- Thanks to 64-bit, additional PC-resources become available. Under some circumstances, the demands of imc STUDIO went to the limits of a 32-bit program.
- The file size for measured data and circular buffer memory is no longer limited to 2 GB (does not apply to data storage on devices belonging to the firmware group A "imc DEVICES").

The list of operating systems supported has been modified

Supported operating systems

Windows 10 64-bit

This enables us to adapt better to the currently prevalent operating systems. Older component such as those required for Windows 7/8 and 32-bit systems can be deleted, in order to de-clutter the system.



Performance und parallelization

In a variety of applications, imc STUDIO 2022 offers smoother operation, particularly when using high channel counts. For this purpose, the capabilities provided by modern PCs in the areas of parallelization, multitasking and multi-threading are rigorously exploited. imc STUDIO is thus able to utilize the available PC resources in a more dynamic and comprehensive way. Additionally, the performance in the setup is significantly increased. This particularly applies to the selection of devices (adding devices to the measurement setup), and to the saving and loading of experiments.



Use of the new data format

The new imc data format (*imc3*) is now supported, applied and generated.

One major advantage of this format is the display of large data volumes in the curve window. It is no longer necessary to load large data volumes completely before they can be viewed. Instead, only so much data are loaded for the curve window as can also be displayed. In this way, you are able to quickly scroll and zoom, no matter how large the volume of data is.

Storage of the data is resilient to interruptions; even incomplete files can be used without the need for repairs. Furthermore, it is possible to save the imc EOS Monitor channels in the envelope curve format in which they are generated.

The prerequisite for loading the files generated is imc FAMOS 2021.



Uniform default file paths

The respective default paths for the various imc-programs have been grouped together under "C:\Users\Public\Documents\imc". Thus they are no longer scattered either directly under "Public Documents", in their own "Documents" or any other paths. Exception: The imc STUDIO / imc WAVE database.

This does not affect update installations, which continue to use the previously specified paths.

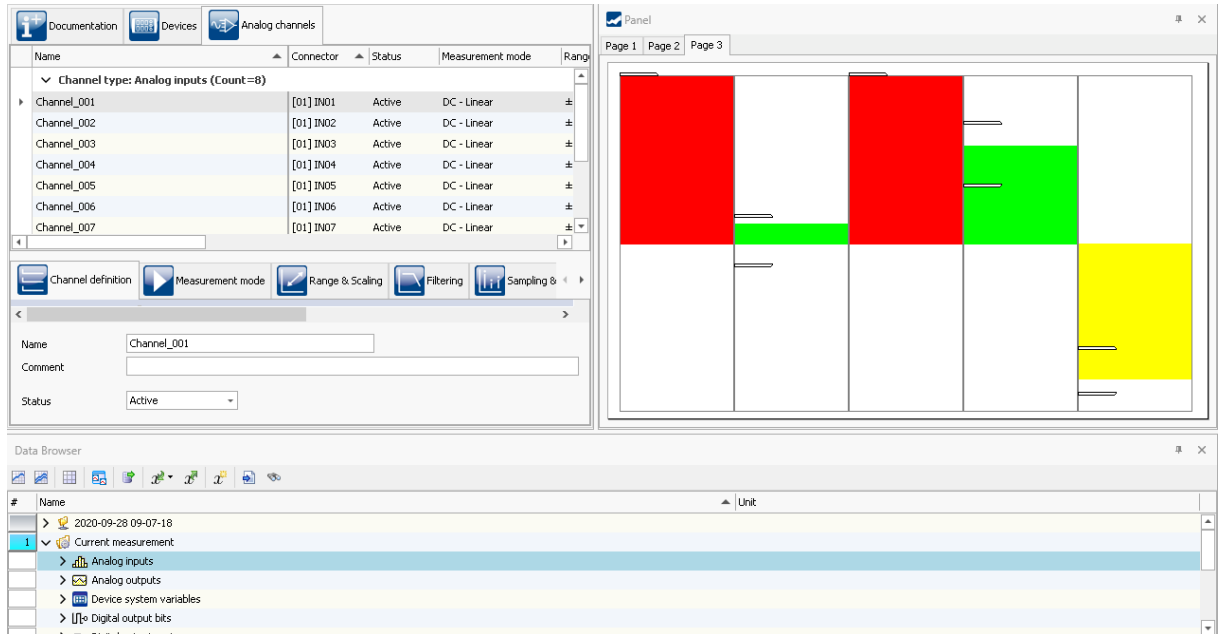
4.4.2 Style

The user interface now features a new and improved design (device configuration pages, Logbook, progress indicators, options, menu ribbon, ...). The design elements are more flat and modern, the colors have been modified, some icons and dialogs have been revised... Some examples are stated below.



Window arrangement and self-defined window compositions

You can display the tool window and main window on other pages. For instance, you can display the Data Browser in the window of the Automation. Or you can show the Panel in the Setup.



Example: Panel and Data Browser are displayed together in the main window "Setup".

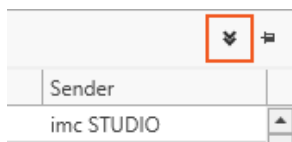
Views optimized for workflow

Certain small improvements provide assistance in reaching the right pages more quickly and getting a better overview. Thus for instance, in the "Compact" view, the Tab-bars are now always arranged at the top and no longer as previously with some below the contents. On the Channel Balance page as well, the tab bar is situated on the top in both the Standard and Complete Views.



Collapsing the Logbook

The Logbook is provided with a button for collapsing it when it is not pinned. If the Logbook pops open to show a message, you can use this button to collapse it back out of sight.

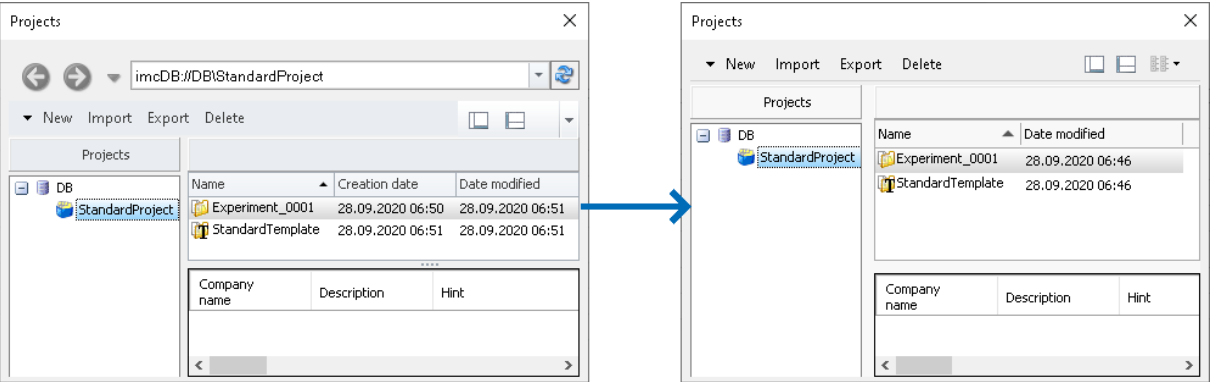


As previously, it still also automatically collapses when you take the focus away from it.



Project management

The design of the Project Management dialogs has been made more lean. The internal project path and the Next- and Back-buttons have been removed, and the "Creation date"-column has been as well. It is possible to get this column back via the context menu.



left: old dialog
right: new dialog



New menu ribbon icons or designation

Menu item		
	Connect	New icon
	Disconnect	New icon
	Panel Fullscreen	New icon and new name - Previously "Panel Fullscreen mode"
	Panel embedded	New icon and new name - Previously "Panel Embedded Mode"
	CAN	New icon
	Save current data	New name - Previously "Save current measurement data"
	Export current data	New name - Previously "Save current measurement data as"

Notes on compatibility: No modifications are necessary. Any menu actions which were used in the command: "Execute menu action" will continue to function as accustomed.



Uniform terminology

Various display texts and terms have been revised and standardized; e.g. the term: "*Download*" has been renamed to "*Prepare*", and also the channel type designations at various locations have been standardized. Here are a few examples:

Old term	New term
Digital inputs	Digital inputs (ports)
Digital input bits	Digital inputs (bits)
Counter inputs	Incremental counter inputs
Net bits	Ethernet bits
Analog fieldbus channels	Fieldbus: Analog inputs
Digital fieldbus ports	Fieldbus: Digital inputs (ports)

Notes on compatibility regarding the channel types in Setup: See "[Setup and device control](#)"¹¹⁴



New start menu icon

The start menu now presents large icons for imc STUDIO, Monitor and imc WAVE, equivalently to that for imc FAMOS, in conformity to the Windows 10 style.

4.4.3 Measurement management



Placeholders - Path to the last measurement

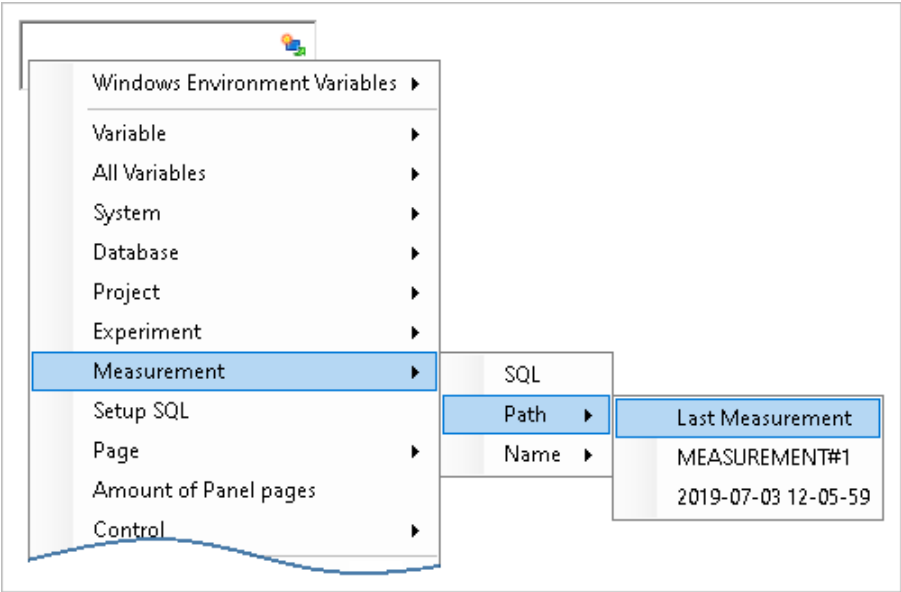
For the purpose of recovering the path to the last measurement, a new dedicated placeholder is now provided.

```
<MEASUREMENTS["MEASUREMENT#LAST"].PATH>
```

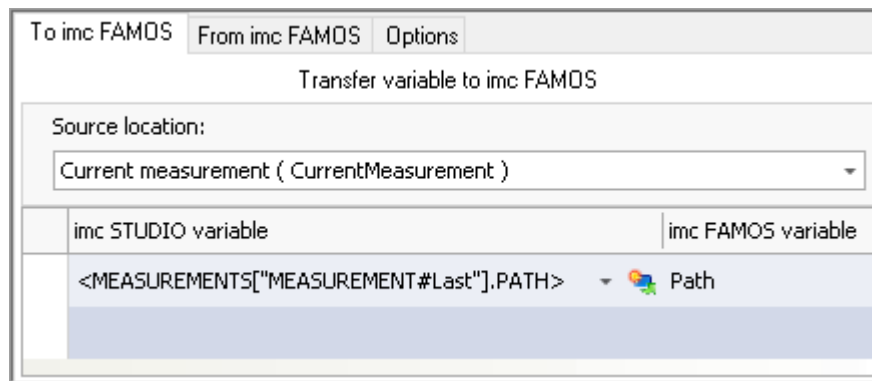
This always will provide you with the path to the last measurement. The following placeholders have been implemented:

Placeholder	Description
<MEASUREMENTS["MEASUREMENT#LAST"].PATH>	Returns the data storage path to the measurement last saved.
<MEASUREMENTS["MEASUREMENT#LAST"].NAME>	Returns the name of the measurement last saved.
<MEASUREMENTS["MEASUREMENT#<Measurement number>"].PATH>	Returns the data storage path of the measurement having the respective measurement number; e.g., you can select a measurement in the Data Browser. For example, it can be assigned the number "1". You now have the ability to find the path to this measurement by means of the placeholder.
<MEASUREMENTS["MEASUREMENT#<Measurement number>"].NAME>	Returns the name of the measurement having the respective measurement number. For an example, see "PATH".
<MEASUREMENTS["<Measurement name>"].PATH>	Returns the data storage path of the measurement having the respective name.

Currently, you can't obtain the placeholder via the Placeholder-symbol, since there is no input support. Instead, use the context menu. In this menu, under "Measurement" there are various examples which you can select. Subsequently, you can modify the text according to your requirements.



Creating the placeholder via the context menu



Example: Transferring the data storage path to imc FAMOS

The path to the last measurement saved remains known even when the experiment is re-loaded.

Special cases:

- If the last measurement is deleted, the last measurement performed before it becomes the last measurement.
- Measurement data folders created by different methods: In the Data Browser, only such folders are considered the "Last Measurement" if they were genuinely created by running a measurement. Whenever folders are created in a different way, e.g. imc FAMOS-events or by means of Scripting, etc., they are not treated as the "Last Measurement".
- Data storage using the menu item "Save current measured data": This is considered a measurement and can become the "Last Measurement".
- Subsequent adding of files: When imc FAMOS-results are saved to an already existing measurement, this does not count as a "new" "Last Measurement".



Data Browser - Measurements can be viewed without being loaded

You are able to expand the entries of all measurements without needing to load the measurements first. The information on which channels belong to the measurement is also available before the measurement has been loaded.

Automatic loading on demand - Only whatever is required is loaded

When the value of a variable belonging to a saved measurement is required, the entire measurement is no longer loaded; instead, each variable can be loaded individually. This provides advantages regarding speed: since only such variables are loaded which are really required, loading is significantly faster.

When does a variable get loaded? A variable is loaded automatically whenever the associated value is required; e.g. when the variable is displayed in a Widget or is used in a command.

The option for deactivating the function: "Automatic loading on demand", is no longer available.

New events for the measurement management

Conclusion of measurement, new measurement, measurement deleted and measurement updated - see "[Events](#)"¹²⁶

Customized storage location for measurement data

The options belonging to the "Measurement storage area" have been renamed to "Storage location measurement data". Additionally, these options are no longer tied to the component "Project Management". They can now also be used if that component is deactivated.

4.4.4 Experiment- and Project Management

Copying experiments to different projects

You are able to copy experiments to a different project. This can be done either by means of Drag&Drop or via the context menu. Doing this affects all files included in the experiment-folder: measured data, saved measurement settings, parameter set files or even personally created folders for metadata.

Modifiable experiment template

When you create a new experiment, should a certain device already be selected? Do you use configurations or Setup pages which should already be available upon creation of the new experiment? This is all possible with the help of the experiment templates. The procedure for creating these templates has now been simplified. When you select the menu item "*Save as Template*", the current configuration is used as the basis for all subsequent new experiments.

When you click on the button, a new template is generated which the system then uses automatically (keyword "*Preferred experiment template*"). (from the edition "imc STUDIO Professional")

4.4.5 Firmware and new hardware

 Notes

imc DEVICES Firmware-Version as of 2.14

With this version of imc STUDIO, only imc DEVICES firmware versions as of 2.14 are supported. Please perform a firmware update of your devices in case these are still running version 2.13 or any older one. The firmware update from Versions 2.7 through 2.13 to Version 2.14/2.15 is free of charge.

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.15 R1 \(and 2.14\)](#)¹⁰⁴
- [Firmware imc DEVICEScore 3.4 R2](#)¹⁰⁸

4.4.5.1 Firmware imc DEVICES 2.15 R1 (and 2.14)



A time zone must be set

In order to make it possible to assign a time to measured data, the measurement can only be prepared when a time zone is set for every imc device used.

 Reference

Additional changes regarding the device configuration are noted in the section: "[Setup and Device Control](#)"¹⁰⁹.

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Clock change	Some devices have determined an incorrect date of the next day when: • the time was adjusted in the last hour of the last day before switching to Daylight Saving Time. • the time was adjusted during the first hour of the day of the switch back to Standard Time.
CAN assistant	• In the CAN-Assistant, AUTOSAR (ARXML) import was conditional on enabling of the ECU-protocols. This is no longer applicable as long as no ECU protocols are imported by that means. • In devices of the types imc CRONOS and imc C-SERIES, assignments of CAN-process variables in sendable messages was lost upon closing the Assistant. • A2L-import: In some cases, the channel names are automatically modified upon import (e.g. if they are too long). In order to make the changes traceable, there is a new option: "<i>Save original name of imported channels in the channel comments</i>". If this option is activated, then upon import, each channel's name is additionally saved with the channel comment.
imc Online FAMOS	When a number with decimal places is assigned to an Integer variable, this is recognized as an error. <pre>int var_int = 1.234</pre> Thus, some possible causes of error are eliminated, since the data type is often not indicated by a variable's name. Assignments of Float variables to Integer variables remain possible, as previously, and do not require modifications.
Flexray	• ARXML-import: Import of AUTOSAR v4.3.1 has been implemented. • Import of Fibex files has been extended to Version 4.x.

Area	Description
IWT-Fieldbus	The interface for the IWT-Fieldbus has been supplemented with some functions.
NMEA-compatibility	Expansion of the NMEA-compatibility. The following NMEA Talker ID's are supported: • GA: Galileo Positioning System • GB: BeiDou (BDS) (China) • GI: NavIC (IRNSS) (India) • GL: GLONASS, according to IEC 61162-1 • GN: Combination of multiple satellite systems (GNSS) (NMEA 1083) • GP: Global Positioning System (GPS) • GQ: QZSS regional GPS augmentation system (Japan)
imc Online FAMOS	The function " <i>AudioBaordThirde</i> " is no longer provided in the Functions list. However, it can still be used.

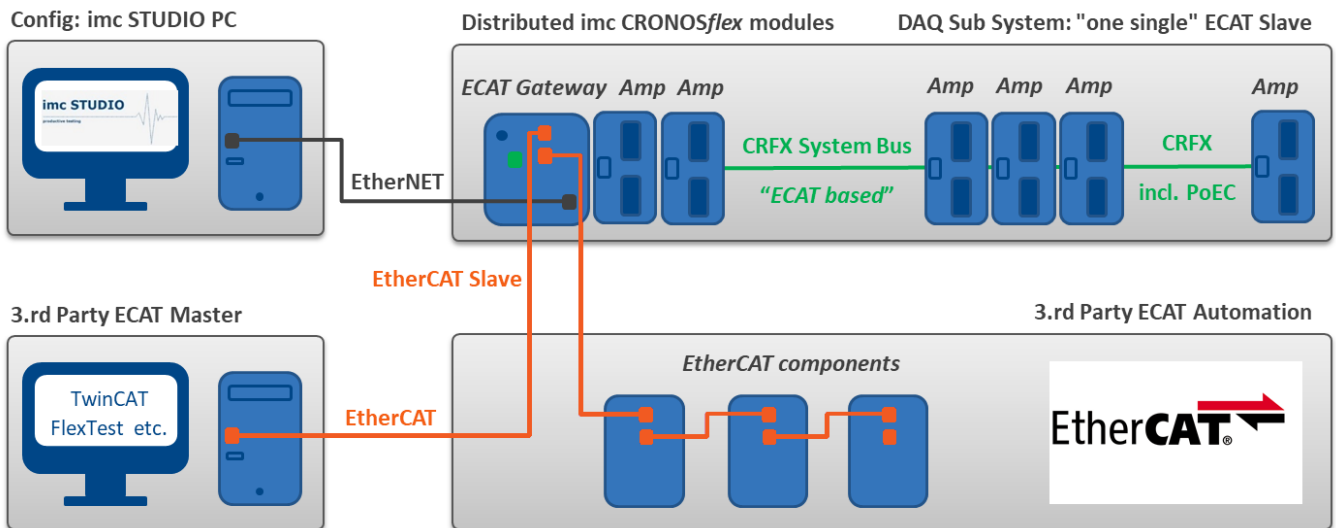
Hardware



CRFX EtherCAT Gateway

imc CRONOSflex EtherCAT Gateway - At a glance

The imc CRONOSflex EtherCAT Gateway is a bus coupler that allows a number of imc CRONOSflex amplifier modules to be used within an EtherCAT-based automation or control system. imc amplifier components can thus be used in EtherCAT environments such as Beckhoff TwinCAT or MTS FlexTest, for example, without the need for a complete imc CRONOS data logger system (with base unit).



In connection with the gateway, the CRFX modules act as a data acquisition subsystem in the sense of an EtherCAT slave, without operating in the network of a complete imc CRONOS data logger. The individual modules are interconnected via the CRFX system bus. This imc CRONOS system bus is based on the "EtherCAT standard", uses network hardware and is spatially distributable via network cables (Power-over-EtherCAT). The protocol of the imc CRONOS system bus differs from the "EtherCAT Standard". It is not compatible with EtherCAT third-party systems, i.e. the CRFX modules cannot be operated in such an environment. The ECAT gateway establishes this connection, forming a single EtherCAT slave station.

Using imc STUDIO, the ECAT slave subsystem is configured on single time via EtherNET. Subsequently and in active operation, this access connection is no longer necessary.



Compatibility: Discontinuation of imc devices belonging to groups 2 and 3

In conjunction with the new firmware, the following devices and device groups are no longer officially supported: All devices belonging to groups 2 and 3. This includes all devices having serial numbers 12xxxx (including imc CRPL, imc CRSL, imc C1, imc C-SERIES).

What needs to be observed when using the devices? We no longer test the new version on older devices. In consequence, new functions may not work with these devices. Additionally, error handling is not performed for the devices.

We assume that the devices will now continue to operate as before. However, we can not guarantee that this will continue to be the case with future version.

(For your information: this does not apply to the devices imc CRSL-N, imc C1-N/FD and imc C-SERIES-N/FD. Support of these devices continues; they can be identified by the serial numbers 14xxxx.)

Please contact our tech support if you have any questions.

Compatibility: Discontinuation of imc HiL

Due to the discontinuation of imc HiL, the Setup page "*HiL + Application module*" has been renamed to "*Application module*". Additionally, the page has been assigned a new icon. (This change does not take effect on existing views)

4.4.5.2 Firmware imc DEVICEcore 3.4 R2

Our measurement device series imc CRONOS, which many customers have been using for over a decade for reliable recording and processing of multi-channel measurements at test stands or in mobile settings, has now been supplemented with a new generation of devices: imc EOS now breaks through to new dimensions of capability by providing channel data rates of up to 4 MHz.

For the configuration and control of the new measurement devices, a new driver package with new firmware is available: imc DEVICEcore.

You are able to operate devices belonging to both firmware groups in parallel and to configure them to jointly perform an imc STUDIO-experiment. Using imc DEVICEcore, you can communicate with and control the new devices at many times higher speed.

Hardware



imc EOS-U4

imc EOS - At a glance

- 4 MHz sampling rate per channel and device
- 1.8 MHz analog bandwidth
- 24 Bit A/D converter
- Wide measurement ranges: galvanically isolated precision measurement amplifiers for signals up to ± 100 V
- Safe data storage with integrated 1 TB flash memory
- Able to operate without PC
- Can be networked via Gigabit Ethernet
- Click connection: mechanically compatible with imc CRONOSflex
- Operates synchronously in conjunction with all imc measurement systems (via IRIG-B, NTP)
- Easy to use thanks to modern imc STUDIO/imc WAVE software, uniform for all imc systems

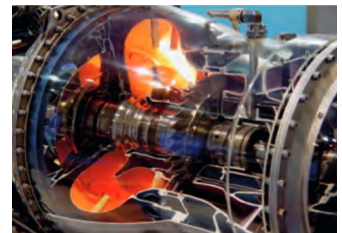
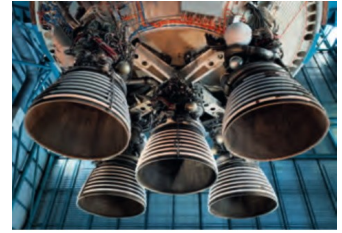
High-speed measurement devices for the MHz range

imc EOS stands for speed! With sampling rates of up to 4 MHz, imc EOS allows the precise analysis of very fast dynamic processes. Voltage, current transducers and IEPE sensors for acceleration, sound or force can be measured at four isolated inputs.

Thanks to high-speed data acquisition technology and versatile measurement inputs, imc EOS is suitable for the analysis of very dynamic processes in material testing, vibration analysis and component testing. Along with crash tests, ballistics testing, pyro technics and blasting tests, typical application areas are rocket propulsion, turbines and jet engines. In automotive applications imc EOS is able to analyze fuel injection and ignition processes, acquire data on high-frequency vibration of motors, transmissions and suspension and investigate switching action and highly dynamic actuators. In the field of e-mobility, the system can be used for characterizing inverter-driven e-motors.

imc EOS systems can be operated with direct interactive PC control or as autarkic systems. The devices are equipped with integrated flash memory, allowing data storage of up to 1 TB independently of a PC. Networking imc EOS via Ethernet allows data transfer to a PC as well as archiving to Network Attached Storage (NAS).

imc EOS is compatible with all other imc data acquisition systems and can be operated synchronously with these systems in one single comprehensive measurement tasks. This is especially attractive for users who are already working with imc systems and wish to extend their existing equipment with high-speed channels.



4.4.6 Setup and Device Control



Calibrating the amplifiers

At delivery, the amplifiers are freshly calibrated. Routine calibration ensures reliable measurement. Along with the information on the amplifier type, the calibration date is now also displayed. (This change does not take effect on existing views.)

If you have any questions about your measurement amplifier's calibration, please contact our tech support.



Reading out TEDS and defining the channel color directly at "Channel definition"

"Complete" view: There are now new parameters on the dialog "Analog channels" > "Channel definition": "Color" for the channel color in the curve window, and "Sensor" for reading out the information in TEDS. (This change does not take effect on existing views)



Synchronization - NTP-settings parameters in the user interface

On the Setup page "Devices", the NTP-settings parameters listed below are available in the table description. Thus you can insert these into the table:

- Synchronization NTP server 1 and 2
- Synchronization NTP deviation time max.
- NTP synchronization interval
- Synchronization waiting time on self start max. (applies to all synchronization types)

In addition, an NTP tab for the configuration is displayed:

Storage	Synchronization	NTP	Timed start	Measurement options
NTP server (1) 0.0.0.0				
NTP server (2) 0.0.0.0				
NTP synchronization interval				
NTP deviation time max. 0 ms				



Trigger - Trigger_48 omitted from the user interface

Why is the trigger for starting measurements actually the last trigger?

"Trigger_48" has been replaced by "BaseTrigger" and retains this permanent name. Wherever it is not required, it is hidden. For example, the BaseTrigger can no longer be displayed on the Setup page "Trigger".

Is there anything to be aware of when converting old experiments? No. The triggers are not renamed in existing experiments; they keep their names. Only newly selected devices obtain the new trigger name.

Notes: In imc Inline FAMOS, it will be possible to use both trigger names for the control commands. The only one which the system will still offer will be "BaseTrigger". However, if you load a source code having "Trigger_48", this will also work.

"1-Trigger" is now called "Immediate"

All channels which are not assigned to any other trigger start in response to the internal "BaseTrigger". The "BaseTrigger" previously was linked to the "1-Trigger". The new term for this mechanism is now "Immediate", since it starts the channels immediately.



Interval data storage ignores the folder "Meta"

Interval data storage no longer deletes any existing folder having the name "Meta". If the count of intervals is limited, the metadata folders are successively deleted once the amount specified has been reached. The folder "Meta" is now ignored. This applies even if the folder contains measured data.

Display of measured data and data storage upon re-connection

When imc STUDIO connects with a running measurement, no more event-based data are generated. A new measurement folder with a new time stamp is created. X0 (X-offset) is entered accordingly, so that the two measurement folders can be evaluated correctly even in the relative display mode.

If no gap in the data is detected (data overflow: e.g. RAM buffer time elapsed), the data in the RAM-buffer is read out. Even if imc STUDIO has closed in the meantime.



Compatibility: Default values saved in the projects

The default values are now saved with the project. In this way, you can easily transfer the default values to other computers along with the project. Additionally, you can define varying default values for each project.

Previously, the default values were saved with the application and were applicable to all projects.

Compatibility: If your imc STUDIO 2022 installation is an update installation from Version ≤ 5.2 , then upon first starting, a message appears in the logbook. Please note the following:

- Upon installation, the default values are temporarily copied from the application settings of the older version to the application settings of the current version.
- After first starting, these are moved to the current project. After this, they no longer exist in the application.
- Be certain to save the project. Otherwise, the default values will be lost.
- If you use multiple projects, export the default values and import them to the projects in which they are to apply.

In the application settings for 5.2, the default values will continue to exist, if the version had not been uninstalled. There, you can still export the default values as accustomed.



Compatibility: Uniform data storage and display within a measurement

The measured data are always displayed in the curve window in a representation having an X-offset (X0) "relative" to the time "0". (The following remarks do not pertain in the case of a "Pretrigger".)

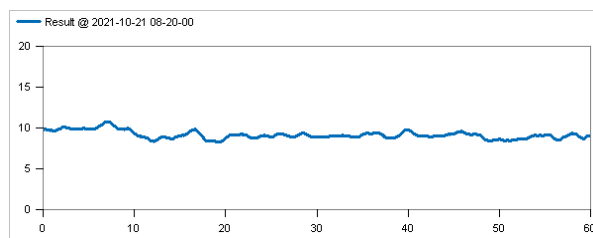
- Upon start of the measurement, the X0 for all starting channels is set to 0.
- For a triggered channel, the point in time when the trigger releases is usually interesting. For that reason, the X0 is set to 0 for each trigger release. This means that each release is assigned a new "creation time".
- With interval saving, the measured data are regarded as "one" continuing measurement. Each time measurement resumes, X0 is increased proportionally to the point count of the running measurement. The "creation time" thus always remains the same. This means that the intervals can be viewed together, as in a continuous measurement.

So far, this matches the previous behavior.

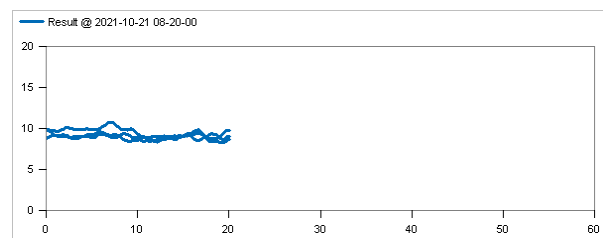
However, the results of the function "Suspend / Resume data storage" had in the past deviated from this. In this case, it had depended on the channel type how the resumption was expressed in X0.

- Now, all channel types behave the same as for interval data saving. They are regarded as "one" continuing measurement. Each time measurement resumes, X0 is increased proportionally to the point count of the running measurement. The "creation time" thus always remains the same. This means that the saved data, as with interval data saving, are treated as one continuous measurement. Additionally, the relative x-coordinates of the saved data now also correspond to the data under "Current Measurement".

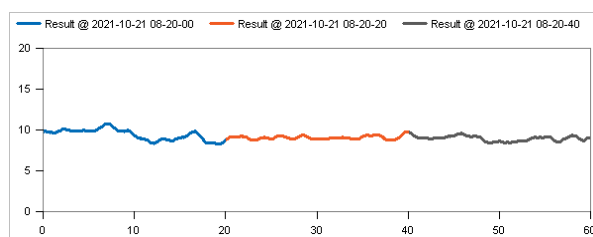
Among others, the equidistant channels such as the analog channels are affected by this change.



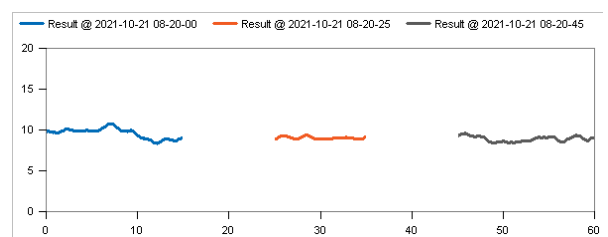
A measurement with continuous data saving



The channel has been triggered - X0 is reset to 0 upon each trigger release



Interval saving - The X0 position is increased at each interval



Suspend/Resume data storage - The X0 position is increased upon each resumption



Compatibility: Data storage - "Continuous numbering" eliminated

Previously, you could use the option: "*Path naming*" to set whether data storage is performed either with a "*time stamp*" or "*Continuous numbering*". This selection is now omitted.

By means of the option "*Storage location measurement data*" (previously: "*Measurement Storage Area*") you can design any desired setup of how to save your measured data. However, as of now, data storage to the device only supports the time stamp option.

Note the following if you load experiments having the setting "Continuous numbering" from Version 5.2 or older:

No information is posted to indicate that this setting is no longer used. The selection is still set to "Continuous numbering"

- When saving to the PC: Data storage with time stamp is used automatically. No special notes to observe in this case.
- When saving to the device: At this time, data storage is performed with "Continuous numbering". Therefore, please set the parameter manually. In future, this will no longer be supported or tested.

In the new view, this parameter is no longer displayed. However, if you use an existing database, the parameter remains visible as long as you continue to use your views.

If you use the new views and wish to correct the setting, you can still insert the parameter in the top device table and modify it there.

Compatibility: Data storage - Measurement number has been eliminated

The measurement folder generated no longer is assigned the so-called "Measurement number" (example: "2020-03-31 10-00-00 (1)"). This number had served to indicate when device settings had been changed, and this when the measurement had to be "re-prepared".

Since there are now substantially more ways to make changes to the experiment, the "device" is no longer the only determining feature which indicates to which series a measurement belongs. For this reason, the number is no longer stated.

If you wish to generate a measurement number, use the option "*Storage location measurement data*" (previously: "*Measurement Storage Area*"). Here, you can specify your own counter variable which you can iterate either upward or downward at suitable locations.

Compatibility: Data storage - "Circular buffer memory in the file" and limitation of "saved events" has been eliminated

The new data format doesn't support circular buffer memory and not a limitation of the number of saved events for the data storage. If this is active in your experiments, you are notified accordingly upon loading, indicating that this setting is no longer effective.

Please set the parameter "*Circular buffer time (PC)*" to "*Unlimited*" and "*Saved events (PC)*" to "*all*". If you use the new views, these parameters are hidden. In this case temporarily add the column to the table by means of the "*Column chooser*".



Compatibility: Data storage - Equal treatment of "Save trigger events in individual files"

Behavior when the option: "*Save trigger events in individual files*" is activated: The measured data are saved separately in individual subfolders. The names of the subfolders correspond to the respective assigned trigger names. This now also applies to the "*immediate trigger*" (Start-trigger without any defined source). Previously, all channels associated with a "immediate trigger" were saved together in the folder "*BaseTrigger*" [previously designated "*Trigger_48*"] when saving data to the PC.



Compatibility: Channel type designations

Due to changes to the [channel type designations](#)¹⁰⁰, some modifications may become necessary if these parameters are used as the target of a "Parameter set import". If you have defined any custom assignment instructions which do not use a "Connection" or "Name", but rather the "Channel type": e.g. all "Counter inputs", then please modify the instruction and if necessary also the existing parameter sets.

The following channel type designations have been modified:

Old term	New term
Field bus: Analog inputs	Fieldbus: Analog inputs
Digital inputs/ outputs (ports)	Digital inputs / outputs (ports)
Field bus: Digital inputs / outputs (ports)	Fieldbus: Digital inputs (ports)
Field bus: Digital inputs / outputs (bits)	Fieldbus: Digital inputs (bits)
Counter inputs	Incremental counter inputs
Monitor: Counter inputs	Monitor: Incremental counter inputs
Display variables	Display variables
Net bits	Ethernet bits

4.4.7 imc Online FAMOS and imc Inline FAMOS



Initialize variables

Whether with- or without Control Commands, variables can now always be created identically: whether "a = 1" or "a = 1".

In simple applications without control commands, it is no longer necessary to place an underline before single-value variables.

And if the application becomes more complex over the course of developments, the control commands can be activated. Advantage: the variable-syntax remains the same and thus also the spelling and sorting order in the Channels list.

Editor – Autocomplete can be switched on/off

Via the context menu in the Editor, it is possible to activate/deactivate the Autocomplete function.

Function: FFTAverage

For the "Overlapping", the values 33.33% and 66.66% are now also available.



Channels originating in different time zones

In imc Inline FAMOS, it is possible to apply calculation operations to combinations of channels even from different devices located in different time zones (as long as these channels are assigned to "BaseTrigger" [previously designated "Trigger_48"]).

4.4.8 Inline Analysis - imc WAVE

The channel-based calculations familiar from imc WAVE are now also available in imc STUDIO.

The Inline Analyses "**imc WAVE Noise**", "**imc WAVE Vibration**" and "**imc WAVE Rotation**" offer numerous capabilities for spectral examinations in the fields of **acoustics**, **vibration analysis** and **order-tracking analysis**. What this means is taking signals measured over the time domain, typically generated by microphones and accelerometers, and performing spectral frequency analyses, such as Fast Fourier Transformation or 1/3- and octave spectrum analysis, on them in real time. For this purpose, a comprehensive variety of settings options are available in order to allow parameterization of the analyses according to established standards. This includes time- and frequency-weighting with standard procedures and filters, window functions, etc.

The Inline Analysis "**imc WAVE Structure**" offers functions for 2 channel **spectrum analysis**, e.g. frequency response function or coherence.

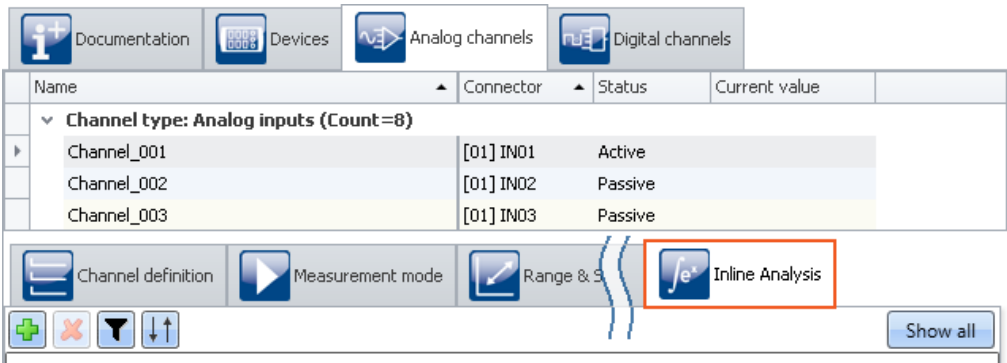
With the corresponding license, you are able to activate the following analyzers:

Name and license required	Description
imc WAVE Noise	Functions for noise analysis, e.g. sound pressure level, Leq, sound intensity, FFT-spectra, 1/3-octave and 1/1-octave spectrum. • Sound level meter Standard IEC 61672-1 • 1/3- and 1/1-octave analysis as 3D or averaged Standard IEC 61260-1 • FFT analysis as 3D or averaged • Determining the sound intensity (time plot, narrow band spectrum and 1/3-octave spectrum) for measurements with an intensity probe
imc WAVE Rotation	Functions for analysis of rotating machinery • Resampling of time-domain channels • Order-tracking analysis as a 3D or averaged • FFT analysis as a 3D or averaged • Calculation of an input signal over time to a channel over RPMs (RPM-presentation) • Calculation of spectrum over time or revolutions, to a 3D-channel over RPMs (RPM-vector-presentation) • Calculation of 3D cross sections
imc WAVE Vibration	Functions for vibration analysis of human vibration and machine diagnostics • Filters (LP, HP, BP, BS, simple/double integration, simple/double differentiation, envelope curve) • Machine diagnostics standard ISO 10816 and ISO 20816 • Human vibration filters standard ISO 2631-1, ISO 8041, DIN EN 12299 • 1/3- and 1/1-octave analysis of vibration as 3D or averaged Standard IEC 61260-1 • FFT analysis as 3D or averaged
imc WAVE Structure	Functions for 2-channel analysis in the frequency domain • Generation of output signals for the purpose of subsequent modal analysis • Calculation of transfer functions with noisy input- and/or output signals • Calculation of the coherence as a quality indicator • Power rating by means of the cross-power-spectrum and spectral power density • FFT analysis as 3D or averaged

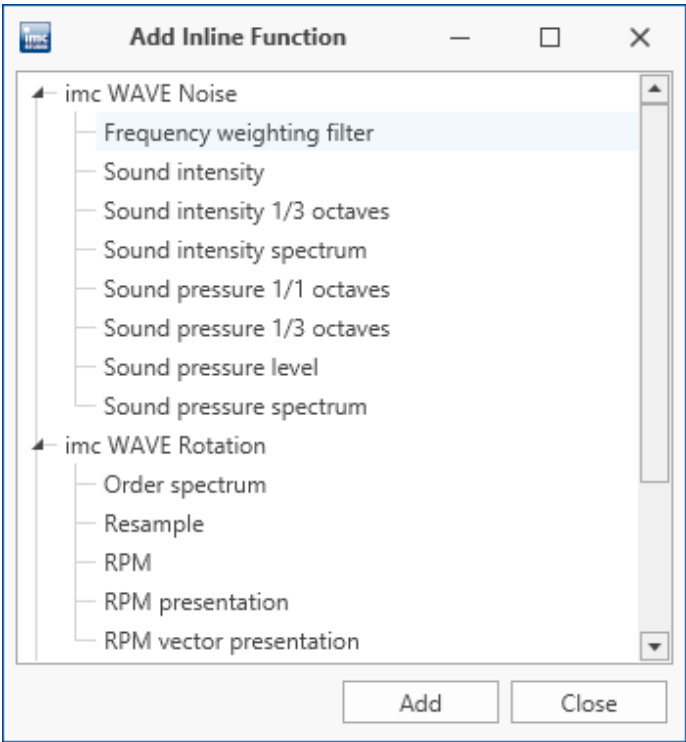
Using the "Inline Analysis"-dialog, you can calculate/derive additional channels from a measured channel.

Setup page: Analog channels

Dialog: Inline Analysis



Here you can activate and parameterize Inline Functions specific to individual channels.



Adding a new Inline Functions

4.4.9 Panel, Widgets and Data Browser



"Execute menu action" Widget - Larger icons

The menu ribbon icons are displayed according to scale in the Widget *"Execute menu action"*. This means the icons adjust their size to the Widget's size. This makes these icons easier to recognize. The icons adjust their size while retaining high resolution; the old ones only were stretched out.

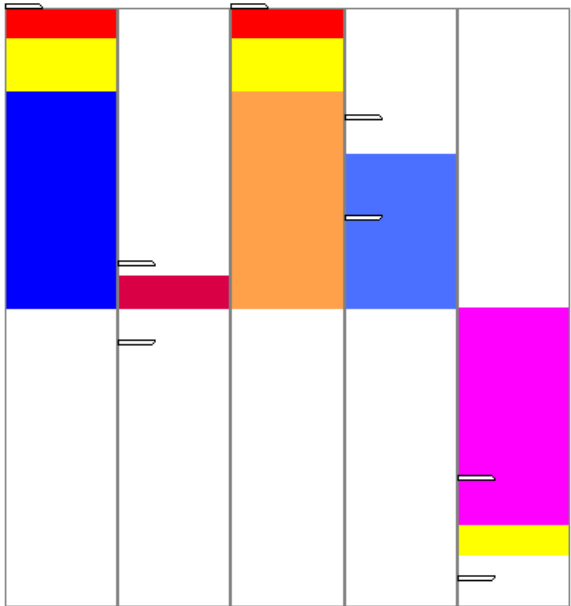


"Execute menu action" Widgets



Curve window - Level indicator

The level indicator now features a three-level color display.



Level indicator with five channels



Float-variable on the DIO-Widget

The DIO-Widget is implemented as the preferred choice for the device's DIO-ports and Integer pv-variables. Float-variables can also be displayed. The handling for the Float-variables has been improved.

1. pv-Float - The bit count has been limited to 22 bits.
2. If the Widget is linked with Float variables, then boundary violation symbols are displayed if the number is either too small or too large for 22 bits.



Inserting Widget - Commonly used Widgets

When you drag a variable to the Panel, a choice of Widgets is offered. The list is automatically modified according to your previous selection. Widgets which you had recently inserted frequently have priority among the choices available.

In the subgroups, all Widgets are available for selection, as accustomed.



Data Browser - Transfer to imc FAMOS

You can conveniently transfer the variables/measurements selected to imc FAMOS by means of the context menu, and analyze and evaluate the channels measured there.



Data Browser - Event time

When a measurement has multiple different channel starting times (event times), one entry for each different event time appears in the column "*Event time*". The selection is available if the individual channels' **start times** are **different**. For instance, this is the case when in a triggered measurement the individual channels are triggered in succession by different events.

Display All

The selection list now provides a new entry: "*All available*". This entry is selected by default. It causes all channels and their associated events to be displayed, even if these were started at different points in time.

Exception: "*Save trigger events in individual files*". In this case, only the channel of the first applicable event is displayed.

Extended relationships

When a defined event is selected, the system will make every attempt to display as many channels as possible. What is new is that all channels which have any time overlap are displayed.

Example: One channel starts at 14:00 and ends at 15:00.

New behavior: If this channel's event time is selected, all channels are displayed which have measured data from the time between 14:00 and 15:00.

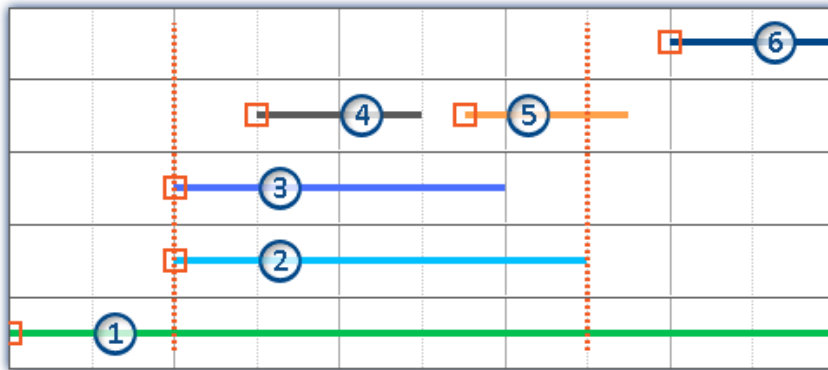
Old behavior: When this event time is selected, all channels are displayed which have any measured data at the point in time 14:00, no matter when the channel ends.

Exception: "*Save trigger events in individual files*". In this case, only the channel of the first applicable event is displayed.



Example

Event time



Dotted lines: Start and stop-times of channel 2; e.g. 14:00 and 15:00 from the above example

5 channels are recorded. Counting from the bottom to the top:

- Event 1: The first channel is associated with "BaseTrigger" (Start-button).
- Events 2 and 3: The second and third channel are associated with the same trigger (e.g. "Trigger_01"). This generates one event time.
- Events 4 and 5: The fourth channel has two events. This generates 2 event times when "Save trigger events in individual files" is activated. Otherwise, only one event time.
- Event 6: The fifth channel is triggered once measurement has concluded on all other triggered channels (except the first channel).

Thus, the Events list shows either 4 or 5 event times, depending on the setting applicable for "Save trigger events in individual files".

In accordance with the respective selection, the individual channels are loaded and displayed.

New behavior: The second event time is selected (Channels 2 and 3). The time frame of the longest channel associated with the event is used for selecting the other channels (2). All channels for which there are measured data within this time frame are displayed (1, 2, 3, 4 and possibly 5, depending).

Channel 5 is displayed when "Save trigger events in individual files" is not activated. If this option is activated, then only one event channel can ever be displayed at a time. In that case, only the first channel is displayed (4).

Old behavior: All channels which contain values at the event time are displayed (1, 2, 3).



Data Browser - Miscellaneous

- [Measurements can be viewed](#) ¹⁰² without previous loading
- [Automatic loading on demand](#) ¹⁰² - Only whatever is required is loaded

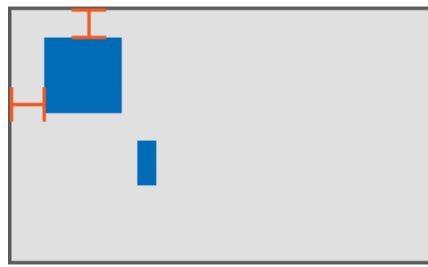
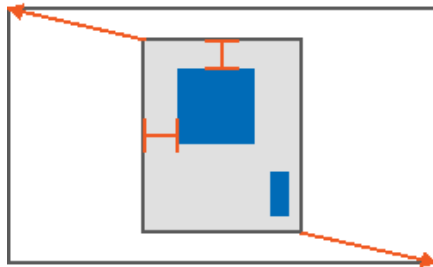
The following functions are no longer supported:

- "Filter list" in the Data Browser. You are still able to assemble a filter.
- "Navigation mode" in the Data Browser. Navigating by button through the measurement or event is no longer possible. You are still able to select any measurement using the mouse and keyboard.
- "Shows comparison measurement" in the Data Browser. The function is currently hidden.



Adapt Panel page to window size (keep Widget size)

New function: The Panel page adapts to the size of the currently available space by only adjusting the page size. This is like when you adjust either the right or the bottom page margin.



Result

The sizes of the individual Widgets thus remain intact.



Discontinued: "Audio-Widget"

The following Widget is no longer supported: "Audio-Widget". It was only needed for the channel type "[Audio-Report channel](#)¹²²" which was also discontinued.

If you load an experiment belonging to the predecessor version which contains a Widget, the Widget is displayed empty and the corresponding message is displayed.

4.4.10 Variables



Display of user name and role on Report-pages

New system variables are available: User name ("*Name*") and user role "*Role*". By means of these variables, you are able to have the user who is logged in automatically indicated in the Report.



New variables for measurement status, connection status and synchronization status

New system variables are available:

Device system variable	Description
Measurement status	Returns the state of the measurement: measurement running (1), measurement stopped (0), unclear (-1) • 1: Measurement running applies when at least one device is performing a measurement • 0: Measurement stopped applies when all devices are known not to be performing measurement • -1: Unclear applies when at least one device is not connected, and no connected device is running
Synchronization status	Returns the device's synchronization status: Synchronized (1), not synchronized (0) • 1: Synchronized, when all devices are synchronized • 0: Not synchronized, when at least one device is not synchronized Devices which are not intended to be synchronized are not included in the status check.
Connection status	Returns the status of the device's connection with imc STUDIO: connected (1), not connected (0) • 1: Connected, when all devices are connected • 0: Not connected when at least one device is not connected



Custom variables created in custom main category

When you create a variable having no category, it is automatically placed among the "*User-defined variables*". When you create a variable having a category, this category is no longer created under "*User-defined variables*", but instead in parallel with it. This allows you to create your own custom folder structures.

If you wish to create a category within the category "*User-defined variables*", you can still do so. Just write a "\" before the category name.



Example

Category: "MeasurementPoint_1". A category called "MeasurementPoint_1" is created in **parallel with** the other categories, such as "*Analog Inputs*". It contains the variable.

Category "\"MeasurementPoint_1". This creates a category "MeasurementPoint_1" **within the category** "*User-defined variables*". It contains the variable.

This applies, for example, to variables created by means of the command: "*Load variable*" or to generating a user-defined variable by means of the Data Browser.



Category-editing - No category

Category editing for user-defined variables and imported variables has been revised.

- The state "*No category*" no longer exists. Anything which previously had "*no category*" is now "*user-defined*".
- The internal identifier "__USER__" is no longer used for identifying the "*user-defined variables*".
- You are able to create variables outside of the category "*user-defined variables*".

Compatibility:

- Configured commands work in the same way as previously. Here, you will not need to make any changes.
The exception are commands which have loaded variables previously created under "*no category*". The variables are now created under "*User-defined variables*".
- If you are accessing the internal identifier "__USER__" in any form (e.g. with imc FAMOS), please make modifications accordingly.



Compatibility: "Data table" - variable type no longer supported

User-defined variables of the type "*Data table*" can no longer be created. When an experiment having such a variable is loaded, a corresponding message is posted in the logbook. The variable is no longer present in the experiment. These variables had been needed for the [SQL-command](#)¹²⁶.

Compatibility: "Channel" - variable type no longer supported

User-defined variables of the type "*Channel*" can no longer be created. When an experiment having such a variable is loaded, a corresponding message is posted in the logbook. The variable is no longer present in the experiment.

These variables are no longer needed for initialization since variables can now be created and replaced using "*Load Variable*".

Compatibility: Audio-Report channel - variable type no longer supported

User-defined variables of the type "*Audio-Reportkanal*" can no longer be used. The [Audio-Widget](#)¹²⁰ and the [Audio-commands](#)¹²⁶ have been eliminated. When an experiment having such a variable is loaded, a corresponding message is posted in the logbook.

The variable type "*Text-Report channel*" is not affected.

4.4.11 Import and export - Variable, measurement, parameter set



Replacing variables from files has been simplified

You now have the ability to **create** new variables and **replace** existing variables in the **same action**. Existing variables could previously only be overwritten using *"Import Variables"*, and new variables could only be created using *"Load Variables"*. These two actions have been combined.

- Now you can use the action *"Load variable"* to either create new variables from a file or to overwrite existing ones. When you overwrite, all properties of the target variable are also overwritten.
- The action *"Import Variable"* has been renamed to *"Refill variable"*: With this action, you are still able to fill existing variables with new values without changing their properties.

Both actions are available in the Data Browser and as a command.



Note

Background information

A function *"Load Variable"* is now implemented, which resembles *"Load Data"* in imc FAMOS. Therefore in contrast to Version 5.2, in the new version it is permitted to overwrite existing variables. A confirmation prompt appears for each conflict of variables. If any of the confirmation prompts is canceled, the entire import automatically cancels. In this way, the system prevents the loading of an incomplete set of controller parameters, for example.

When an existing variable is overwritten in the process of loading, then it is effectively completely replaced, including all of its properties. In consequence, the old variable is neither deleted nor is any new one created, so that no *"events"* are triggered by the deletion or creation. This is important for scripts, curve windows, etc.

In contrast to imc FAMOS, there are variables which cannot be overwritten, e.g. channels or pv-variables. The reason is that, for instance, these variables belong to the specific device, or possess specific data formats and other properties which must be retained. If the user attempts to overwrite them, an error message is posted indicating that they can't be overwritten.

It is also not allowed to overwrite any user-defined variables whose validity range is not *"temporary"*. These variables are assumed to have been explicitly created as having a certain data type, which must be retained. The validity range as well must be retained. Temporary user-defined variables, by contrast, are similarly volatile to data returned by imc FAMOS-sequences. For this reason, they may be overwritten by *"Load Variable"* and can thus, under some circumstances, take a completely different type, etc.

With the *"Load Variable"* command, there is an option for determining whether existing variables can be overwritten with or without a confirmation prompt. By default, this option is activated, meaning that there is no confirmation prompt for overwriting.

By using *"Refill Variable"*, it is possible to change the content of existing variables. This resembles *"Import Variable"* in version 5.2. In this way it is possible, for instance, to change the content of pv-variables or user-defined variables. Since this only changes the variables' content and not their type, the target variable and the variable to be loaded must have the same properties, including, for example, the unit. This is managed more strictly than in 5.2; thus, only values and the sample count may be different. Therefore, please always use *"Load Variable"* in cases where changes are possible.



"Load Variable" - Loading into a saved measurement

When a variable was loaded from a file to a saved measurement, the variable is copied as a file to the measurement folder. The variable is now also available after loading the measurement.

The following components are affected: Command: *Load Variable*, loading by means of the Data Browser.



Menu action: "Save current data" now is equivalent to a full-featured measurement (previously "Save current measurement data")

Saved measurement data are secure

Any measured data which are already saved can no longer be overwritten by the menu action "Save current data". If a repeat attempt is made to perform "Save" to an existing file, the system refuses to perform this action. It is also not possible to perform in conjunction with measured data belonging to a continually saved measurement.

Compatibility: Only the dat-format remaining

This action only saves data in dat-format now. It does not adopt the formats which are set in the Options for the action "Export current data". Conversion of the measured data to other formats is possible by means of "Export current data" or by means of the imc Format Converter. This provides a clear separation between "Measurement" and "Export" in the Options.



Compatibility: Export Variable: imc's custom csv-format no longer supported for variables

The imc custom csv-format has been removed, which contained a csv with a specified link to a Raw/Dat-file. In the command "Export Variables", this format was denoted by "*.csv".

When an experiment having an existing csv-exporter is loaded, a corresponding message is posted in the Logbook. As a precaution, the export type is converted to "dat". Please correct this selection later if appropriate, for instance to a different csv-format.

The following components are affected: Command: Export Variable, export via the Data Browser, options for "Export current Data".

Note: "Export parameter set" (e.g. export of the device configuration as a parameter set) is possible in this format without any restrictions.

Compatibility: Export parameter set: XML format no longer supported

The XML format has been eliminated.

When an experiment having an existing xml-exporter is loaded, a corresponding message is posted in the Logbook. As a precaution, the export type is converted to "csv". Please correct this selection later if appropriate, for instance to a different format.

Compatibility: Export parameter set: User-defined text-variables can not be exported as a parameter set

For **exporting variables' values**, instead of the command: "Export parameters", the command "Export variable" should be used. This command is specially designed for variable values. User-defined text variables can no longer be exported using the command: "Export parameters".

4.4.12 Sequencer and commands



Command "Delete Variable" revised

Variables can be deleted from any category: Previously the command could only delete variables belonging to the category "User-defined". Since user-defined variables can now be created in their own categories, this limitation no longer applies.

The option "Treat error as warning" has been eliminated. Now a warning is categorically issued and no longer an error message. If it is not possible to delete a variable upon running, such as device variables and system variables, an appropriate warning is posted.



Command "Run imc FAMOS sequence" - saving of results modified

When the sequence results are transferred back to imc STUDIO, they can be saved along with an existing measurement. Results which are not saved now land under "Current Measurement", even when a measurement is selected as the target.

imc STUDIO variable	imc FAMOS variable	Save
Res1	Res1	☒
Res2	Res2	☐

Res1 is saved as a file and as a variable in the last completed measurement.

Res2 is saved as a temporary variable under "Current Measurement".



Compatibility: Command "Run imc FAMOS Sequence" - return values

As the target variable in imc STUDIO, an appropriate data type is now expected. A channel can no longer be transferred to a "User-defined Variable" of the type "Numeric" (Single Value). Previously the system assumed that the last value would be the one to expect. But it could also be an error in the implementation. Now a message is posted to indicate when the data type is not appropriate.

Please modify the type in imc FAMOS if you wish to obtain a single value. If you need a channel, use as the target a variable created by imc FAMOS. This will then always be assigned the appropriate data type.

Compatibility: Command "Run imc FAMOS Sequence" - Only the dat-format remaining

This command only saves data in dat-format now. It does not adopt the formats which are set in the Options for the action "Export current data".



Compatibility: A variable can no longer possible be deleted using the command "Set variable"

The option/column "Delete" is no longer available. As previously recommended in the user's manual, for such a case the command "Delete Variable" is to be used.

When you load an experiment created in the predecessor version, in which the delete function was performed, a corresponding entry is made in the logbook. This entry records the variables which had been deleted by means of the command.

Alternative solution: You can add the command "Delete Variable" at the corresponding location. The existing command "Set Variable" no longer contains the variables to be deleted.



Discontinued: "SQL-Command"

The following command is no longer supported: "SQL-Command". It no longer meets the current requirements of SQL-communication.

When you load an experiment created in the predecessor version which contains an SQL-command, a corresponding message appears in the logbook. An "empty" command as a placeholder is inserted into the sequence where you use the command, in order to indicate the location.

Alternative solution: In such a case, please use the imc FAMOS Database Kit or the component Scripting in order to incorporate a custom solution (license required).

Discontinued: "Playback audio channel" and "Record audio channel"

The following commands are no longer supported: "Playback audio channel" and "Record audio channel". They were only needed for the equally discontinued channel type "[Audio-Report channel](#)".

When you load an experiment belonging to the predecessor version which contains either of these commands, a corresponding error message appears in the logbook. In the sequence in which you use one of these commands, an "empty" command is inserted as a placeholder in order to mark its position.

4.4.13 Events



New events for the measurement management

There are now new Events which are triggered upon changes to the measurements in the Data Browser.

- Upon conclusion of a measurement (or of an interval), the "MeasurementFolder_Closed"-event is triggered.
- When a new measurement appears in the Data Browser, the "MeasurementFolder_New"-event is triggered.
- When a measurement is deleted, the "MeasurementFolder_Deleted"-event is triggered.
- When the measurement is updated, the "MeasurementFolder_Updated"-event is triggered.

Compatibility: The event "Storage_DirectoryUpdate" is no longer supported. It has been replaced with "MeasurementFolder_Closed". Any appended commands are automatically moved accordingly. Please save the automatic change. A corresponding message is posted in the logbook.



User-defined events: Initialization / first value no longer counts as a change

There can only be a change to a trigger, variable or channel if a previous value had already been present. Thus for instance, if during the "Prepare" process for a measurement, a trigger's status changes from "not defined" to "not released", this is not a change. In consequence, no event will be triggered in this case.

This also applies if the event is defined as "Channel < 5". If the channel's value is < 5 already at the beginning of the measurement, the event is not triggered. This had already been the system's behavior previously, if for instance at the end of the first measurement the channel's value was already < 5.

If you wish to apply the condition at the start of the measurement, then link the event to an appropriate trigger (AND conjunction), for example.



Events have been enhanced with the functions: "Stop on error" and "De-/activation"

In the Sequencer-sequence, you are able to activate/deactivate individual commands. Additionally, you are able to make a setting there which governs whether the sequence should be interrupted if an error occurs.

This is now also possible for event-sequences. You are able to deactivate complete events along with their commands, or only individual commands.

Example: A Timer-event is intended to start only once its configuration has been completed. Now you can deactivate it and re-activate it at the desired moment in time.

Link events with commands					
Status	Name	Comment	Enable	Stop on error	
▼	Button1				
▼	Clicked	Occurs when the ...	☒	☒	
	#01 Run imc FAMOS sequence: ...		☒	☒	
	#02 Export parameters		☒	☒	
	#03 Show Panel page as dialog:		☒	☒	
	#04 Export Panel page		☒	☒	

Commands associated with a button's event

Status	Name	Comment	Enable	Stop on error	
▼	Panel	Experiment-specific events of the Panel			
▼	Page 1	Experiment-specific events of the Panel			
▼	Button1	Experiment-specific events of the Panel			
▼	Clicked	Occurs when the button has been clicked.	☒	☒	
	#01 Run imc FAMOS sequence ...		☒	☒	
	#02 Export parameters		☒	☒	
	#03 Show Panel page as dialog:		☒	☒	
	#04 Save Panel page as PDF		☒	☒	
>	Project	Project-specific events			
▼	Sequencer	Experiment-specific events of the Sequencer			
	Device_AfterCheckConfiguration	After checking the configuration of a device	☒	☒	
	Device_AfterRequestConnect	After trying to connect to a device	☒	☒	
	Device_AfterRequestDisconnect	After trying to disconnect from a device	☒	☒	
▼	Device_BeforeCheckConfiguration	Before checking the configuration of a device	☒	☒	
	#01 Import variable		☒	☒	
	Device_BeforeCreateDiskStart		☒	☒	

Commands in the Sequencer associated with the events

1: Applies to the respective command

2: Deactivation applies to all commands associated with the event

If the option is deactivated for the event, this applies to all associated commands. If the option is activated for the event, the setting applied to the respective command.

Compatibility: Converted experiments from older versions work as familiar from previously. Previously, the event-sequences did not halt upon appearance of errors. In consequence, with existing experiments the checkmark for "Stop on error" is not set automatically.

4.4.14 Scripting / API



.NET Framework 4.8

The Target-Framework ".NET Framework 4.8" is now used.



Measurement management

You can load, unload (close), rename and delete measurements by means of a "MeasurementManagerService".



Variables

The variable access has changed fundamentally and is done via the `Variables` class (formerly `Datapool` class). Scripts from 32-bit versions of must be adapted by hand.

By means of the Event-Manager, it is possible to respond to changes to variables.

A blockwise writing of variables has been implemented (internally). In Scripting this can be implemented with the help of the `IVariableManagerWriterTask`.



List-Widget - Editing zones

In Scripting, it is now possible to edit zones of list-Widgets and to supplement these with new entries.



Compatibility: `imc.Studio.Interfaces.V2.dll`

The `imc.Studio.Interfaces.V2.dll` has been integrated into `imc.Studio.Interfaces.dll` and is thus now omitted. Please modify your scripts accordingly.



API

In the imc STUDIO API, the actions relating to saving measured data (*Save/Export current data*) were missing from the constants of the "ActionNames".

The Shared-project, and the sample data no longer bear the name "API" but are assigned the version number, e.g. "API 2022".

4.4.15 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Widget	- Table: When something was entered in the property "Text", it was no longer possible to edit the value of a linked variable by means of the entry. - Curve window: The property "Operable" is now located among the "Important properties".
Data Browser	- When a channel name contained one of the following characters (' and &), it was not possible to load the measurements. Now the characters can be processed correctly. - Feedback to the user - If a measurement can not be loaded, for instance because the files are defective, a message is now posted. - The context menu function "Update Data Browser" has been eliminated. In imc STUDIO, this function is no longer needed.
Current value window	- When a variable is deleted from the Data Browser, it is automatically deleted from the "Current value window". - User-defined text variables having a decimal point were interpreted and displayed as a number in the "Current value window". - In case of an invalid value entry for a numerical variable, the variable is no longer set to 0 but retains its previous value.

Area	Description
Commands	"<i>Export parameter set / variables</i>": When exporting variables in the csv/dat-format, the unit is included in the export. "<i>Set Variable</i>": Numbers having a comma "," as the separator character for the decimal positions can now be subjected to calculations using the command; e.g. "Displayvar_01 + 0,1". Previously, only a period was possible "Displayvar_01 + 0.1".
Project management	In the project management dialogs, many small improvements have been implemented which, among other things, provide assistance in operation or feedback about actions. For example, menu items such as " <i>Add experiment template</i> " are only still offered if they are also activated. The Import-button would be displayed or not depending on the selection. Following import, the experiment was not always selected.
User management and access privileges	There are new access privileges designed to prevent opening the Assistant; e.g. for the imc Online FAMOS Editor, or the CAN-Assistant or the like.
Variables	- Variables which are created by means of "<i>Load Variable</i>" can now also be edited. Previously, they were always write-protected, so that values could not be changed. - After loading/importing of variable, the files were still in use, or blocked. Thus, the files on the hard drive could for instance no longer be overwritten using imc FAMOS. Now imc STUDIO releases the file for editing after the action.
Save view	When one saved the view on a 4K monitor with adjusted font scaling, the view was subsequently defective for smaller monitors.
imc Online FAMOS and imc Inline FAMOS	Autocomplete in the Editor - you are able to switch the autocomplete on/off via the context menu.
Setup - Export	Setup/Export configuration: With "Export balancing values", the monitor channels were always also included in the export.
Setup - balancing	Taring and bridge balancing action before and during running measurement: Upon starting the next measurement after a bridge balancing action, the level indicator automatically adopts the channel's value range boundaries. If the balancing is performed during the measurement, the Widget does not display the correct value level since it only knows the previous range boundaries. The indicated measurement range in the file also retains the previous state.
fos4X	The light output regulation can be set as the parameter "<i>Supply</i>". This applies to fos4Test Dyn, but no to fos4Test nSens. Integer fixed values between 1 % and 100 % can be specified, or alternatively the built-in automatic regulation can be activated. Upon start of the measurement, for a fixed number, the light output regulation is deactivated and the laser output is set to the value specified. For "auto", the light output regulation is activated.
3rd-party devices	Saving measured data: One sample too many was often saved. Example with the device: "<i>FunctionSimulator</i>": Measurement duration: 10 seconds at 50 Hz resulted in 501 data points. Now the result always has the correct point count.
Measure a user-defined characteristic curve	The command "Measure a user-defined characteristic curve" has been reactivated. Using this command, you can record and save characteristic curves for subsequent use; e.g. by means of automatic import of a supplemental file for the Charact -function in imc Online FAMOS.

Area	Description
Automation	• Value limit monitoring - When the sequential order of a boundary limit monitoring was changes, a different value always was returned than the one desired. • imc FAMOS data cutting Saved measurements could be selected as the source. The element in the Automation is not designed for this purpose, since there is no cutting. If the user made this setting, a warning was posted upon loading which indicated that the source will be reset. It is still possible to load individual channels from a measurement by means of @... • Upon encountering an error, the task no longer halts execution of synchronized events (command sequence) but instead continues.
User-defined events	The behavior in response to the conditions " <i>inside of range</i> " and " <i>outside of range</i> " has been corrected. For " <i>inside</i> ", the range boundaries are now included, and for " <i>outside</i> " they are not.
Guardian and WatchDog	There is a separate Guardian and a separate WatchDog for the 64-bit version. In case of parallel installation with a Version 5 system, two services now run. The 64-bit variant has the suffix "V2".
Options	The options for the RAM-size of curve windows and FIFOs have been eliminated. They are no longer relevant for the 64-bit system.
imc STUDIO API	• The acknowledgement in the imc STUDIO API for the method "<i>GetImcStudioInstallPath</i>" in response to incorrect arguments has been improved. • The examples of the imc STUDIO API are now installed in a folder with the imc STUDIO-version number.
Installation	imc DEVICES - Fieldbus selection: In the selection of components for imc DEVICES, all Fieldbusses are now automatically included in the installation. It is no longer necessary to make a selection. Thus any Fieldbus which is available in the device can always be used.
Documentation	• The program "<i>imc Help and Documentation</i>" now also lists the documentation for imc FAMOS (as of Version 2021) and imc Shared Components.
About-Dialog	The About-dialog has been expanded. It now presents the license texts of the currently opened Open Source components.

4.5 Update-notes and compatibility from 5.2 to 2022

If you plan to update from Version 5.2 to 2022, there are a few things which you may need to observe regarding any existing databases. In particular, be aware of the following points:

Area	Function
Discontinued devices	• Devices ^[107] belonging to groups 2 and 3 • imc HiL ^[107] • 3rd-party device: "Agilent" • 3rd-party device "Profinet-Sniffer" ^[95]
Setup	• Data storage - Suspend and Resume data storage ^[112]: X0 now is assigned other values • Data storage - "Continuous numbering" ^[113] has been eliminated • Data storage - "Measurement number" ^[113] has been eliminated • Data storage - "Circular buffer memory in the file" ^[113] has been eliminated • Default values ^[111] are saved along with the projects • imc REMOTE SecureAccess is no longer supported • Channel type designations ^[114] have been modified • Old pages having the name "*-Statistics" ^[93] have been eliminated • Channels with reduced data can not be used in imc STUDIO. imc Online FAMOS results of the "TransRec" function and DI-port compressed channels cannot be transferred to the PC.
Measurement management	• Automatic loading on demand ^[102] - Only what is required is loaded.
Variables	• Category processing - "No category" ^[121] no longer exists • User-defined variables: The types "Channel" ^[122], "Audio-Report channel" ^[122] and "Data table" ^[122] are no longer supported. • Menu action: "Save current data" ^[124] (previously "Save current measurement data"): This action only saves the data in dat-format from now on. • Export Variable ^[124]: The csv-format is no longer supported for variables. • Export parameter set ^[124]: The XML format is no longer supported. • Export parameter set ^[124]: User-defined text-variables can not be exported as a parameter set. • Automatic conversion of the linkages of variables between Widgets and trigger- or system-variables from experiments created in Version 5.0Rx is not possible. Please modify the variable linkages manually.
Data Browser	• "Filter list" ^[119] has been eliminated • "Navigation mode" ^[119] has been eliminated • "Shows comparison measurement" ^[119] has been eliminated
Widget	• The "Audio-Widget" ^[120] are no longer supported
Widget - Table ^[94]	• Interplay between settings for "Factor" and "Decimal places" has been changed. • Decimal place count: "auto" no longer equates to "1".

Area	Function
Commands	- It is no longer possible to delete a variable using the command "Set Variable" ¹²⁵. - Discontinued: "SQL-command" ¹²⁶ - The commands: "Playback audio channel" ¹²⁶ and "Record audio channel" ¹²⁶ are no longer supported - The command "Run imc FAMOS sequence" ¹²⁵ - Channel return values can no longer be transferred back to a "User-defined variable" of the type "Numeric" (Single value). - The command "Run imc FAMOS sequence" ¹²⁵ - This command only saves data in dat-format now.
Events	The event "Storage_DirectoryUpdate" is no longer supported. It has been replaced by "MeasurementFolder_Closed" ¹²⁶.
Automation	imc FAMOS data cutting ¹³⁰: A saved measurement can not be selected as the source.
Scripting	imc.Studio.Interfaces.V2.dll ¹²⁸ has been integrated into imc.Studio.Interfaces.dll.
imc STUDIO PowerQuality	imc STUDIO PowerQuality is no longer supported
Options	The option for hiding the measurements in the Data Browser has been moved. It is now located as follows: Options: "Variables" > "Measurement Administration" > "Access to stored measurements" Due to the extra internal separation between the components "Project Management" and the display of the measurements in the Data Browser, the option cannot be ported over when updating from older versions. If you wish not to see any measurements in the Data Browser, deactivate the option again.
3PDI - Function Simulator	The device needs to be de-selected once and then re-selected when you load an experiment from imc STUDIO 5.2.

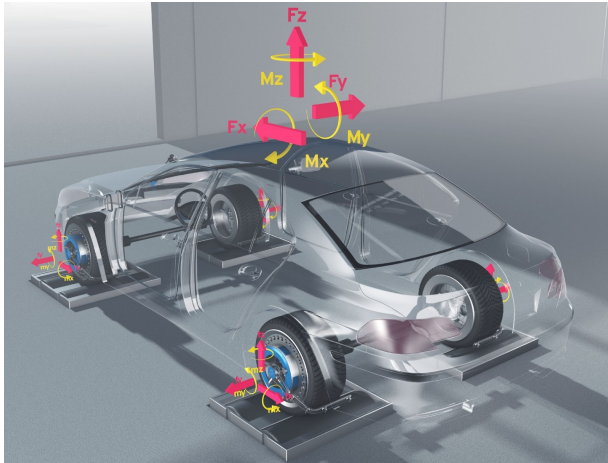
5 imc STUDIO 5.2

5.1 imc STUDIO 5.2 R25

imc WFT Assistant

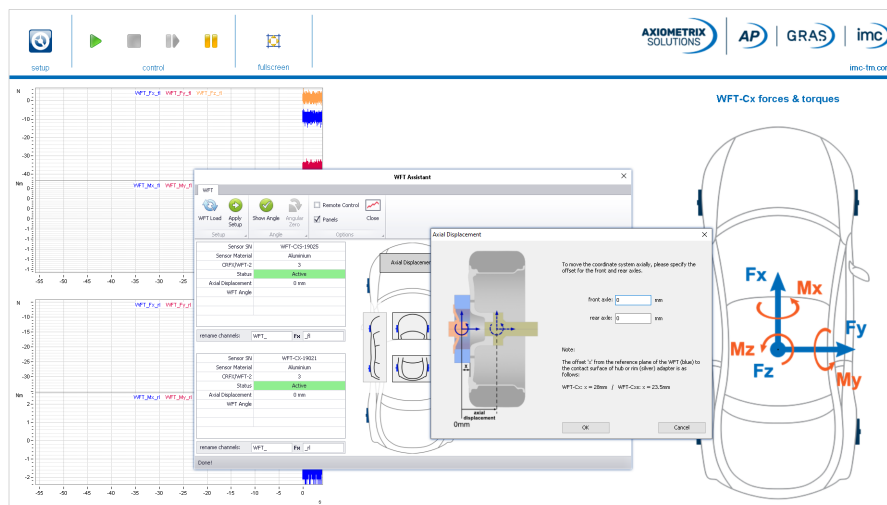


Configuration and usage of 6-component wheel force transducers



Forces and moments in the vehicle coordinate system

The WFT plug-in provides a user-friendly Assistant for configuring the 6-component WFTs, as well as pre-made Panel-pages for optimized display of measured results.



Sample Panel-page and Assistant interface



Reference

Documentation

Documentation on the WFT-Assistant is presented in the imc WFT Manual or in the special description "AddInfo_WFT.en.pdf" on the imc website, located in the download area under "Wheel Force Transducers".

<https://www.imc-tm.com/download-center/product-downloads/wheel-force-transducers/manuals>

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Bus Decoder	Decoding of Fieldbus bits by the Bus Decoder caused the appearance of the error message: <code>"OBD_DataSink::CreateBusfilterSink(): m_pBusfilterSink != NULL Bus Decoder"</code> .

5.1.1 Firmware and new hardware

imc DEVICES as a driver package for imc STUDIO

The drivers and firmware components for imc devices are provided in "imc DEVICES".

- imc DEVICES: For devices belonging to the [firmware group A](#)²⁷⁷ - e.g. CRONOS family, C-SERIES, SPARTAN, BUSDAQ



Notes

Compatibility between imc STUDIO and imc DEVICES

In regard to the use of imc DEVICES as the device driver, there is a clear distinction determining the compatibility of versions/version groups:

imc STUDIO version	assigned firmware / version group	additionally compatible
5.2 R1-R2	2.10	---
5.2 R3-R9	2.11	2.10
5.2 R10+	2.13	2.10, 2.11

For version 5.2, the applicable rule is: the assigned version group and all **predecessor groups going back to 2.10** are compatible with the imc STUDIO-version used.

This imc STUDIO version has been released along with the following firmware and devices driver packages:

- [Firmware imc DEVICES 2.13 R20](#)¹³⁴
- [Firmware imc DEVICES 2.13 R19](#)¹³⁵

5.1.1.1 Firmware imc DEVICES 2.13 R20

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
CAN-Assistant	A2L import: "MAXTIX_DIM" is supported.
CAN-Interface	CAN FD When CAN FD messages were sent in Motorola format, it caused the measurement to crash.

5.1.1.2 Firmware imc DEVICES 2.13 R19

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
imc Online FAMOS	Function: <code>OtrFrequLine</code> : The parameter " <i>Period length</i> " was no longer accepted as a decimal number.
CAN-Assistant	In a certain case, import of a DBC-file returned the error: " <i>Invalid file format</i> "; error number: 21095. The DBC-file was correct, however one parameter's expected values were not complete and needed to be corrected.
CAN-Interface	• XCP on CAN In certain cases, sending via XCP on CAN caused the CAN-Interface to crash. • In the Prepare stage, the device would restart when other channels besides an ECU configuration were created in the CAN-configuration.
WFT	The imc Online FAMOS-function <code>RunAutoBalance</code> now also starts the balancing of the WFT-channels both via imc STUDIO, e.g. with a virtual bit, and in Autostart.
imc BUSDAQflex with CANFD	The device restarted in response to high data volume on multiple CANFD-nodes.
imc BUSDAQflex	A watchdog now monitors the WLAN connection. This ensures that the WLAN connection is re-established even if no DHCP server is available at the time of waking up (even with <code>WakeOnCAN</code>). The watchdog checks at regular intervals whether the DHCP server is available again and requests an address.
Hardware imc SPARTAN BC16	Low passes with a corner frequency < 5 Hz showed an amplitude which was too low.
Connection to the device	The firmware programs are automatically allowed in the " <i>Windows Defender Firewall</i> " upon installation. For this reason, popup dialogs about the firewall no longer appear upon first connecting to the device.

5.2 imc STUDIO 5.2 R24



fos4X - Data storage of the fos4X-channels has been revised.

Previous behavior:

fos4X-channels were previously saved as equidistantly sampled channels. The time stamp of the first sample returned was used as the starting time. The time stamps of any subsequent samples were ignored since it was assumed that the samples would arrive at the specified sampling rate.

This mode is now replaced with two new procedures. You can now toggle between time-stamped data and equidistant data (resampled).

Background:

With long-duration measurements, it can occur that the data do not arrive at exactly this rate. Deviations by as much as 0.01 per mil have been observed. This produces noticeable effects when the measurement duration is long. For this reason, the exact time stamp is important.

If you record data with "*Time stamp*", it is possible to obtain an equidistant channel by resampling with imc FAMOS, for instance, during post-processing after the measurement.

In order to avoid needing resampling, the mode "*Sampling rate*" is provided. Here imc STUDIO performs the resampling directly during the data are recording. This compensates for the possible slightly deviating sampling rate.

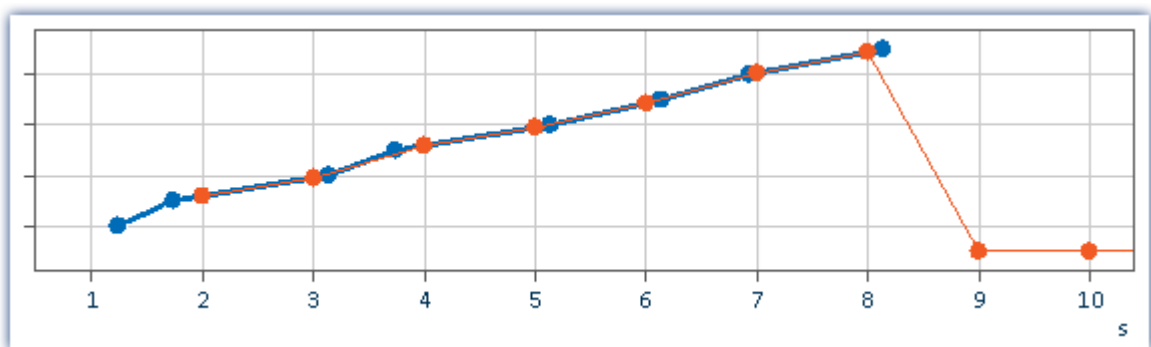
X-axis: Time stamp

- The time stamps provided by the 3rd-party fos4X device are saved. The measurement duration of time-stamped channels is limited to 800 days. Additionally, they require more memory space. The precision of a time stamp is 256 ns.
- The sampling rate set is also required for sending the requests to the fos4X-device. This is the rate at which you want to receive the data.

X-axis: Sampling rate (equidistant data)

- The data stream starts at the next full second on the clock after arrival of the first sample. The system performs linear interpolation between the values returned at the sampling rate specified. Adjacent to any error fallback values, calculation of the interpolation applies the error fallback value.

Example with exaggerated offset to illustrate:



Parameter "X-axis" set to Time stamped (blue) or Sampling rate (orange)
Values at 9 s and 10 s: error fallback values



Security vulnerability from log4net

The Assembly for Log4Net has been updated to Version 2.0.14.

Note: There is no risk due to this security flaw when used in conjunction with imc STUDIO. Log4Net is used as an element of the scripting editor, so it is sporadically loaded and used. However, this scripting-editor is a programming tool for enhancing imc STUDIO with custom functionality. It is not a web-server or any similar mechanism running in the background, which could be induced by some external request to run malware (which is the problem arising from the log4j security flaw). Furthermore, the scripting-editor has no Administrator privileges. Thus, no malware could have any effects on the system beyond the effects produced by script you wrote yourself.

For this reason, there is no cause for alarm in regard to any published version of imc STUDIO to date. In this version, the assembly has been updated.



Note

See also

<https://github.com/advisories/GHSA-2cwj-8chv-9pp9>

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Command: E-Mail	Files sent using the command "E-Mail" were locked. It only became possible to edit them again once imc STUDIO was closed. Now, the file is no longer locked.
Profinet-IRT	Upon transfer to a different device, the Profinet-configuration went missing.
Application module	When an experiment was created in which an Application module was used without an editor, it was no longer possible to save the experiment.
Widget - Table	PDF-export - The values displayed in a table do not contain up-to-date values if the table was not visible at the time at which export was performed.

5.2.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

- [Firmware imc DEVICES 2.13 R18](#) ¹³⁷
- [Firmware imc DEVICES 2.13 R17](#) ¹³⁸
- [Firmware imc DEVICES 2.13 R16](#) ¹³⁸

5.2.1.1 Firmware imc DEVICES 2.13 R18

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Hardware: imc CRONOSflex	An internal error (9934) was corrected, which occurred in very rare cases in consequence of repeated triggering.
CAN-Assistant	• For signals in the format "real number", it is now possible to specify a scaling-factor and scaling-offset. If they exist, the factor and offset are also included when importing DBC-files. • The system's behavior when importing CBA-files having more than one node has been improved. The settings can be loaded to the selected node individually. • A2L-Import When importing A2L files, it was only possible to search for labels in the A2L import dialog a few times. After that, the list of labels remained empty.

Area	Description
CAN-Interface	- In spite of only moderate demands on the CAN-node, the error 5101 (aggregate sampling frequency of CAN-channels too high) occurred. - XCP on CAN When both nodes of an interface were used for XCP, then on the second node, not all necessary messages were send.
imc CANSAS modules	Under some circumstances, adjustment of the Baud rate of multiple imc CANSAS modules no longer worked: upon configuring, a warning immediately appeared, indicating that a module was no longer found.
XCPoE-Interface	When the frequency of transmitted XCPoE packets was high, packets could go missing due to an overload of the XCPoE interface. The interface's performance has been optimized so that now up to 10k packets/second can be processed.

5.2.1.2 Firmware imc DEVICES 2.13 R17

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
CAN- and XCPoE-Assistant	In the CAN- and XCPoE-Assistant, the maximum count of events and DAQ-lists supported has been increased to 40.
CAN-Assistant - PIDs	OBD2-ECU Protocol - In the CAN-Assistants, additional PIDs conforming to the standard SAE J 1979DA:2021-04-21 have been implemented for the OBD2-ECU protocol. - In the CAN-Assistant, it is now possible to enter user-defined PIDs with the OBD2-ECU protocol.
CAN-Assistant - A2L	In some circumstance, after importing an A2L, the CAN-Assistant could display duplicates of an event. This was reported as an error upon running the syntax check.
imc Online FAMOS	The syntax check which runs upon reading values from a CAN-message has been optimized.
CRONOS-PL\DIOINC CRONOS-PL\ENC-4	With the DIOINC- and ENC-4 boards of the imc CRONOS-PL device family, in the mode " <i>Angle (abs)</i> ", the angle was indicated incorrectly, since the scaling " <i>Imp/revolution</i> " was not calculated correctly.
CRFX\HISO-8	At slow sampling rates (below 2 Hz), incorrect offsets were generated in 16-bit mode.

5.2.1.3 Firmware imc DEVICES 2.13 R16

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
WFT	- Balancing via imc Online FAMOS: When performing balancing using the imc Online FAMOS function RunAutoBalance, an internal data overflow occurred in imc Online FAMOS. - The balancing-interval now indicates the correct count of revolutions.

5.3 imc STUDIO 5.2 R23

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Widget - Table	- It was no longer possible to set the table's visibility in response to a variable's value. The table was always invisible if a variable was entered. - Texts were no longer displayed: Values of text variables and contents of the property: "Text".
Command: "Execute device action"	The command "Execute device action" could no longer be configured or used. An error was raised. The command can now be used again.
Profinet-Assistant	When loading experiments, in some cases a warning was posted that a new version of an external editor (e.g. Profinet-Assistant) was available. However, updating was not possible. Now the editor used (Profinet-Assistant) is no longer saved with the experiment. Instead, the editor provided with the existing installation of imc STUDIO is always used. Upon first loading the experiment with the new version of imc STUDIO, the message is displayed again one single time. The change takes effect upon saving, so that the message is no longer displayed afterward.
imc API	With the imc API, a theme name (including "None") can be transferred to the constructor of the imc STUDIO-component. For "None", the theme is not overwritten.

5.3.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.3.1.1 Firmware imc DEVICES 2.13R15

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
CAN-Assistant	- In various situations (e.g. when closing imc Online FAMOS or when adding a comment on the channel), in some cases the error message "<Name>: Channel name does not exist" was posted, even when the channel did exist. The message appeared when ECUs were accessed via XCP. - When importing a CAN-configuration with activated support of "J1939" to a node with support of CAN-FD, selecting "Prepare" caused the measurement device to reboot. - When importing .arxml files, when the messages' names were very long, the same new name was sometimes assigned to different messages.
ARINC-Assistant	The ARINC-Assistant has been enhanced and now saves additional parameters in the configuration (*.idB2-format); e.g. bus speed.
XCPoE-Assistant	Opening the XCPoE Assistant raised an error.
Certificate	The installation contains a new certificate. Additionally, it is available for download on the homepage. For transfer via secure https access, a certificate obtained along with the installation purchase. This certificate has an expiration and must be renewed annually.
imc Online FAMOS	The function "AudioBaordThirds" is no longer provided in the Functions list. However, it can still be used.

5.4 imc STUDIO 5.2 R22

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Device interface configuration	By means of the Device Interface-configuration, it was possible to enter IP addresses which do not conform to standards. Now any additional preceding zeroes, letters or periods entered are no longer adopted.
Bus Decoder	The Bus Decoder can now decode data containing texts.
fos4X	fos4X-devices support laser power regulation. Previously, it was always active even if in some cases it was not desired. Now the setting is no longer modified by imc STUDIO. This makes it possible, for example, to set the value by means of the fos4X-program "fos4TV".
RoaDyn2000-Editor	- In the Editor for assigning outputs, in the column "Channel", the channel names "As" and "An" were interchanged. - Name collision handling for RoaDyn2000-Editor Before closing the dialog with "OK", the Editor checks whether all channel names assigned are unique. If any conflict is detected, you are not able to close the dialog. Closing by clicking on "Cancel" remains possible. In consequence, name decoration no longer occurred.
imc LICENSE Manager	imc STUDIO failed to respond in various situations. A new version of imc LICENSE Manager fixes this problem and is now included with installation. (Also already included in the AddOn for imc STUDIO 5.2 R21)
About-Dialog	The About-dialog has been expanded. It now presents the license texts of the currently opened Open Source components.

5.4.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.4.1.1 Firmware imc DEVICES 2.13R13

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
CAN-Assistant	- In devices of the types imc CRONOS and imc C-SERIES, assignments of CAN-process variables in sendable messages was lost upon closing the Assistant. - In the CAN-Assistant, AUTOSAR (ARXML) import was conditional on enabling of the ECU-protocols. This is no longer applicable as long as no ECU protocols are imported by that means. - During DBC-import, the invalid characters "/" and "\" in names are automatically replaced with underlines "_". This also applies to the message names (since these are sometimes used to construct digital ports).
Flexray-Assistant	- ARXML-import: Import of AUTOSAR v4.3.1 has been implemented. - An AUTOSAR (ARXML) file would not be imported if any optional data were missing.
IWT-Fieldbus	The interface for the IWT-Fieldbus has been supplemented with some functions.
LIN-Assistant	When importing LDF-files, frames were rejected when they had no content.

Area	Description
Problems when creating an Autostart experiment	• imc Online FAMOS: With the function CodeRange, when a single value was assigned as the 1st parameter instead of a channel, the system crashed when an Autostart experiment was created. • NTP-synchronization for ANDIS devices: The NTP parameters can now be written by a script to the configuration and this can be written to the ANDIS as an Autostart experiment.

5.5 imc STUDIO 5.2 R21

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Options	The option "Reduce logbook entries" was not saved. Now the Sequencer-info-messages are reduced (not displayed) also after re-starting.
Widgets - Tables	The tables did not respond to the setting " <i>Refresh rate</i> ". No matter what setting was made, the refresh rate used was always " <i>Fast</i> ". Thus, when you are displaying many variables in a table, you now have the ability to significantly reduce the demands on the CPU by setting the update rate to " <i>Slow</i> ".
Experiment management	Data integrity has been enhanced for cases when overwriting experiments with measured data. The prompt for deleting all measurement data has been improved. The system prevents immediate exiting of the prompt by a single click.
imc Inline FAMOS	Interval data saving on the PC: When the function " <i>FFTAverage</i> " was applied to channels which were not equidistant, the interval data saving was not applied correctly. Folders dated in the future were generated.

5.5.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.5.1.1 Firmware imc DEVICES 2.13R12

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
imc Online FAMOS	- New function available: "<i>ReduceDataRate</i>" - This function is applied to fieldbus channels which were sampled at a (slightly) higher data rate than necessary (ratio up to 2.5). In consequence, such channels contain some duplicate measured values. "<i>ReduceDataRate</i>" eliminates these duplicate measured values as far as possible while still achieving the target data rate. - The functions "<i>Mean</i>", "<i>Max</i>", and "<i>Min</i>" were no longer accepting any variables which had been defined in the control command "<i>OnInitAll</i>".
CAN	- CAN-Assistant - Export to the format .dbc modified Channel names containing a dot "." character in their name caused problems when loading the file to other tools. Now, upon exporting a dot character is converted to an underline "_". - Import of an A2L was performed incorrectly. Once imported, the channels sometimes had the wrong number in the name. - XCP on CAN - Send-channels in the format "<i>Real Number (4 Byte)</i>" were sometimes sent as Integer data.
XCPE	Import of an A2L was performed incorrectly. Once imported, the channels sometimes had the wrong name and wrong address.
Profinet and Application module	Some changes to Profinet and Application module channel parameters were discarded when the Assistant was re-opened and then closed. The changes affected were such which had not been made in the Assistant (e.g. by means of the Setup pages), and which are also otherwise not editable in the respective Assistant.
Manuals	Some E-Book manuals could not be opened on PCs in the region of Asian-language fonts.

5.6 imc STUDIO 5.2 R20

This version implements some minor bug fixes. Additionally, advances have been made in preparations for integrating the new imc device firmware for the coming new generation of devices.

When selecting the product during installation, you will find a new entry: "*Firmware and driver package imc DEVICEScore*". You can leave this choice always activated even if you are not using any imc DEVICEScore-device.

5.6.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

- Firmware imc DEVICES 2.13R11

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Automatic Timed Start with CRFX/CRXT	In some cases, the following phenomena occurred: Upon starting measurement for a second time, the CRFX/CRXT crashed. Upon stopping, the message 137 "The data acquisition DSP could not end the measurement ..." appeared. The error occurred often when measurement was performed with at least one channel having a sampling frequency of 100 kHz!
imc Online FAMOS	In two cases of compiling the imc Online FAMOS source text, the following error message was posted: "Type error on right side ...". One case involved a bug which is now fixed with this version, in which compiling is now possible again. In the other case, the message was wrong. The correct message would have indicated that the DSP's internal memory was full.

5.7 imc STUDIO 5.2 R19

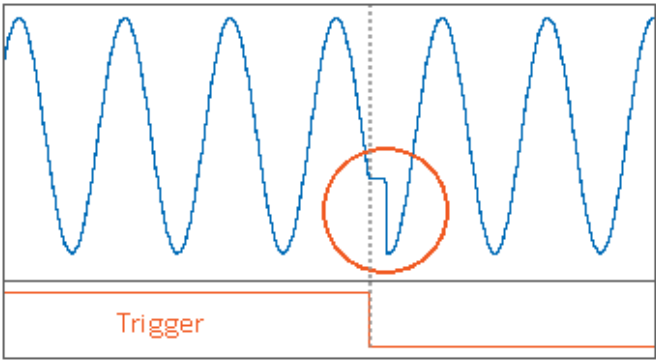
5.7.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.7.1.1 Firmware imc DEVICES 2.13R10

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Firmware-update Recognition of minimum version requirement	Testing for the minimum version required for a firmware update is now performed automatically upon setup of the firmware update dialog. Thus the user is directly informed when the minimum version requirement has not been met and the "Update"-button is disabled.
CAN-Assistant - Importing A2L-files	The data type "Matrix" is now supported. The results generated consist of multiple channels. Furthermore, problems with importing the data type "Digital Bits" have been resolved.
imc CANSAS	Making a change of a channel name applicable throughout multiple slots Whenever names of channels were changed in the imc CANSAS-Assistant with applicability throughout multiple slots, then after they were applied in imc STUDIO, other imc CANSAS channel names were incorrectly also changed.
imc Online FAMOS- channels	The user-defined Y-unit was not applied to virtual channels having special characters or spaces in their channel name.
Updating the pv-variable	Updating of the pv-variable was delayed for a few 100 ms after conclusion of a triggered data capture. The following diagram shows the effect, e.g. when the pv-variable controls an analog:



5.7.2 General changes in imc STUDIO

The list of operating systems supported has been revised

Supported operating systems
Windows 10
Windows 8.1
Windows 7

This gives us better ability to accommodate the most up-to-date operating systems.

Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Balancing during measurement Taring or bridge balancing	- When balancing was performed during a measurement, the system indicated a measurement data overflow. Data which had already been measured were no longer present under the "<i>Current Measurement</i>". Saving of the measured data was not interrupted. - When balancing was performed during a measurement, the behavior of incremental counter inputs changed. For example, a configured dual-track encoder behaved as a single-track encoder. The errors resulted from a change implemented in the level indicators (in the Panel Widget of that name and in the Setup in the column "<i>Corrent value</i>"). This change has now been reversed. The ranges of the level indicator display are only applied after performing "<i>Download</i>" or "<i>Reconfigure</i>". They are no longer adjusted directly after taring.
imc Inline FAMOS-channels	- In cases of data overflow, all channels are assigned a new event. In the process, the X0 (X-Offset) is set accordingly. However, imc Inline FAMOS-channels were assigned a slightly deviating value, so that the channels no longer were positioned directly above each other in the curve window. - The user-defined Y-unit was not applied to virtual channels having special characters or spaces in the channel name.
Experiment management	Whenever experiment folders are copied by means of the Explorer, the folder name changes. However, the internal files keep their names. When such experiments were loaded, there were a variety of consequences in imc STUDIO. These included that the experiment was deleted after closing the program and the measured data landed in the old experiment folder. Now the system prevents such experiments from being loaded and posts a warning. If you wish to use an experiment under a different name, there are a variety of methods. For instance, you can duplicate the experiment using "<i>Save As</i>", or create a backup using the Export function. When importing the backup, you can specify a new name. That would make the names consistent.
Leftover program processes in the Task Manager	Opening the page " <i>Data Processing</i> " or executed imc FAMOS sequences often caused processes belonging to imc STUDIO and imc FAMOS or imc DEVICES to fail to clean up properly once imc STUDIO was closed. In the Windows Task Manager, it was often possible to observe leftover tasks.
imc Format Converter	The imc Format Converter was unable to convert any files when special characters were used in either the folder name or the file name.
Panel page PDF export	Depending on the printer driver, the table -Widget in the PDF-file could sometimes be empty if it was very close to the page margin. This error is now detected by the system. The graphics scaling of the table is now automatically adjusted according to the result, in order to make successful export possible. This adjustment may require a few seconds for the system to perform.

5.8 imc STUDIO 5.2 R18

5.8.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.8.1.1 Firmware imc DEVICES 2.13R9

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
imc CRONOSflex	Transfer of data from CRFX-modules has been optimized. In very rare cases, in triggered channels the measurement was stopped and the base system rebooted.
imc CRONOSflex UNI-4	Bridge balancing - Recognition of overmodulation has been improved. In some cases, overmodulation had not been recognized.
imc CRONOSflex WFT-2	- Signal taring in mobile (stationary) operation has been improved. - The application of the axial displacement and wheel radius in the calculation of the torques Mx and Mz has been improved. These had not previously been applied correctly.
imc CRONOS XT UNI-4	Support of the hardware module completed.
Manual	The user's manual for the WFT-modules has been revised. Additionally, the description of the WFT-C ^{XS} measurement wheel has been added there.

5.8.2 General changes in imc STUDIO

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
imc Online FAMOS and imc Inline FAMOS	- The "<i>Tolerance</i>" function can now be used in the IF-function without an assignment. - New imc Inline FAMOS-tasks could not be renamed. Now the name entered is applied.
Setup	- DO: After setting certain digital output bits, it was not possible to set other output bits. - Asian operating systems: Metadata columns sometimes lost their settings when Assistants (e.g. CAN, Display Editor, ...) were opened and then closed.
Commands - Run imc FAMOS sequence	When the Sequencer was stopped while a synchronous imc FAMOS-command was running, some data from the imc FAMOS-sequences remained in the Windows TEMP-folder. Upon closing imc STUDIO, there also were temporary files from the asynchronous imc FAMOS-sequences left over in the folder if the sequences were not completed. These files are now cleaned up once they are no longer needed. When closing imc STUDIO, there is now an additional message posted if there are still sequences to be processed. Upon closing, the sequence currently running is not interrupted. However, any return values will not be processed. Any additional sequences in the queue for processing are canceled. You can cancel the closing of the program.
Project Management	An experiment was sometimes deleted when the database was located in the network and the experiment was started via double-click/link.
Installation medium	There had been two installation setups for the Format Converter. The one under imc DEVICES has been eliminated.

5.9 imc STUDIO 5.2 R17

5.9.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.9.1.1 Firmware imc DEVICES 2.13R8

imc REMOTE WebServer access - TLS1.2 encryption



As of Firmware version 2.13R8, all supported imc measurement devices support access by imc REMOTE WebServer, based on the TLS1.2 encryption.

5.9.2 General changes in imc STUDIO

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
Widget - Table	Editable channels such as user-defined variables of the type Channel could no longer be edited within the table. Now it is again possible to edit values.
Widgets - Standard	• The Drop-Down-lists for some parameter settings belonging to the Standard-Widgets were empty (on English-language systems); e.g. Image, Table, Lable. • Table: With the text, the property "Margin" was not working on the top and bottom (but left and right did work).
Widgets - Event-dialog	When the Event-dialog was called directly from the context menu, and the key was pressed in a command configuration dialog there, then the Widget was deleted. The key now no longer has has any effect in such cases.
Command - Run imc FAMOS sequence	When the Project Management is deactivated, the imc FAMOS-command did not work correctly. Upon conclusion of the imc FAMOS-command, an error was always recorded in the logbook.
Scripting	Scripts failed to be copied when an experiment was imported to a different device; scripts were lost.

5.10 imc STUDIO 5.2 R16

5.10.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

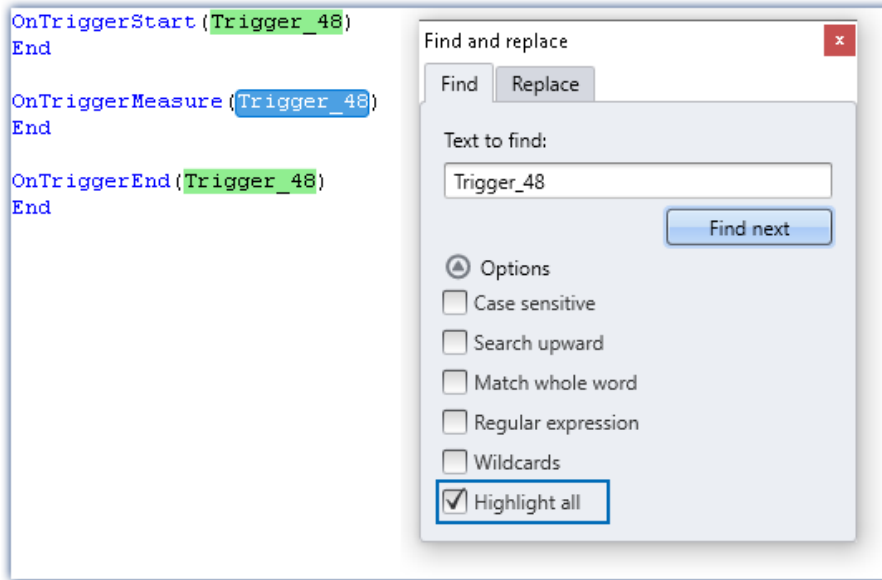
- Firmware imc DEVICES 2.13R7
- In this version, certain issues have been resolved.

5.10.2 imc Online FAMOS and imc Inline FAMOS



Find - Highlight all

The Find & Replace dialog has been expanded with a new option: "*Highlight all*". When this option is activated, all search hits are additionally highlighted in light green.



5.10.3 Automation



Repository - Recording states

It is now possible to record states in the Automation repository. Events and their associated commands are included along with the state.

imc FAMOS-data cutting is discarded, since it is not necessarily associated with only one state.

5.10.4 Widgets



32-bit-Integer-Status-Variable on the DIO-Widget

The DIO-Widget is primarily implemented for the device's DIO-ports. Now the Widget is also able to handle the device's Integer-pv-variables correctly.

For this purpose, the count of a pv-variable's bits displayed has been limited to 32 (0-31). Additionally, it is possible to handle negative numbers since the Integer-pv-variable is a signed integer.

Thus, this data type comes with a 32-bit Integer-Status variable.

The limitation to 32 bits also applies to Float-pv-variables. However, be aware that in this case not all bits can be used. The same limit also applies to all other Float variables. Therefore, it is preferable not to use these variable types with this Widget.

5.10.5 Miscellaneous optimization

Alongside minor bug fixes, the following important improvements have also been implemented:

Area	Description
User-defined events	When the condition for a user-defined event was modified, the event subsequently failed to trigger. If any imc FAMOS-command was associated with the event, in this case the command was deleted.

5.11 imc STUDIO 5.2 R15

5.11.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.11.1.1 Firmware imc DEVICES 2.13R6

Fieldbus



CAN - A2L files with multiple Transport-Layer instances

For importing A2L files, multiple Transport-Layer instances are now supported. When the file is loaded, the layers are offered for selection in a list. The channel selection dialog for the respective layer appears next.

CAN - Channels from an ARXML-import

- A warning is posted in the status bar when the user attempts to make any changes to the channels imported by means of ARXML.
- Import by means of the channel selection dialog has been optimized. Only such PDUs which are required by an imported channel are now set up.

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
imc Online FAMOS Editor - Folding	You are now able to completely expand or collapse the control commands in the Editor by means of a context menu entry.
Measurement range increased - Strain gauge measurement	In some cases it is necessary to be able to measure strains of up to 30000 µeps. For this purpose, the maximum measurement range boundaries have been increased.
Device properties	The "Device properties" now only display such properties which are actually used in imc STUDIO applications. The following properties, which are not used, have been hidden: • imc DEVICES - The option deactivated the device for use under imc STUDIO. • imc CANSAS - This option only provides an indication of whether the device supports imc CANSAS modules.
CRFX/WFT-2	imc STUDIO now also supports such mounting mechanisms which return angle values which are rotated by 180°. Previously, it had not been possible to zero angle values lying outside of the range ± 180°.
Firmware-update password	When the firmware-update was password protected, then the dialog under imc STUDIO for prompting entry of the password was not shown. Now this dialog also appears under imc STUDIO.

5.11.2 Setup and Device Control



Renaming the coupling "AC with current supply" to "IEPE"

Some amplifiers offer the option "AC with current supply" for the parameter "Coupling". This selection option has been renamed to "IEPE" (Integrated Electronics Piezo-Electric). This provides a clear indication of the application purpose for which the option is intended.

Please be aware of the following:

- You continue to be able to use experiments in a normal way. If "AC with current supply" is set, the parameter is automatically revised to "IEPE". The default values will also be adopted correctly.
- If you are importing existing parameter set files in which the coupling is set to "AC with current supply", then revise these files. Use a text editor to replace all locations of "AC with current supply" with "IEPE".

Existing parameter set (text editor):

Name	Measurement mode	Coupling
Channel_001	Voltage	AC with current supply
Channel_002	Voltage	AC with current supply
Channel_003	Voltage	AC with current supply



Revised parameter set:

Name	Measurement mode	Coupling
Channel_001	Voltage	IEPE
Channel_002	Voltage	IEPE
Channel_003	Voltage	IEPE



Predefining the data storage path for "Save current Measurement Date as"

The menu item "Save current Measurement Date as" can be assigned a preset (in the Options dialog). For example, you can pre-define the data storage path in which the data storage dialog is to launch. However, if this folder didn't exist, the default folder and not the desired path was displayed.

New behavior: If the folder doesn't exist, it is created temporarily. But if you don't save the files in it, the folder is deleted once the dialog is closed. However this only happens when it had been created by this method and if it is really empty.



Bug fix: "Start option" is discarded

The "Start option" (e.g. next minute) was discarded when an experiment belonging to an older version was loaded (only affects imc STUDIO 5.2 R14). The issue has been resolved.

- No manual correction is needed for experiments having the Start-option from version 5.2 R13 or lower, when opened in 5.2 R15 (without having been saved in the meantime in Version 5.2 R14).

The following problem remains: Once the experiment has been loaded into 5.2 R14 and saved there, the experiment is not corrected automatically in 5.2 R15.

- **Manual correction** is required when experiments made in the version 5.2 R13 or lower and having the start option set were opened in Version 5.2 R14:
The error remains undetected and the experiment is saved without the correction having been performed. The experiment is then not automatically corrected in Version 5.2 R15. You need to re-set the start option.

5.11.3 Commands



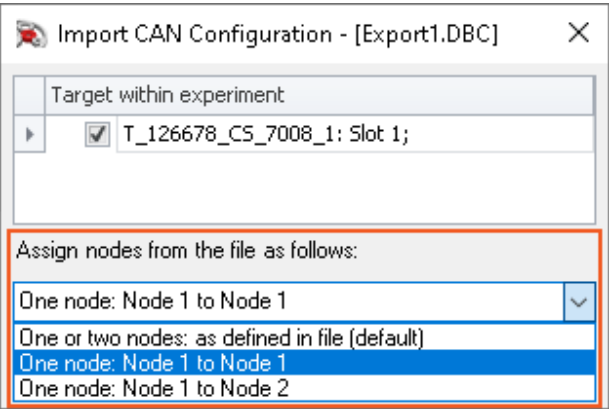
Importing a MFB-configuration - CAN-import

The options for CAN-import have been supplemented:

- **Node selection:** If the configuration only contains information on one node, you can now select to which node to perform the import.
- **dbc-file:** You can now import CAN-configuration files of the file type "dbc" by using the command. Previously, only cba-files were supported.

Node selection:

By means of making this assignment, you can select how the file is to be imported.



Selection	Description
One or two nodes: as defined in file	The file's content is processed sequentially. The first node (belonging to the file) is placed on the first node (in the Assistant). If there is any second node in the file (only cba), then this is set on the second. This mode matches to the previous behavior. If there is no second node in the file, the configuration of the second node is deleted from the Assistant.
One node: Node 1 to Node 1	The file contains only one node - The content of the file is imported to the first node in the Assistant. The configuration of the second node remains intact.
One node: Node 1 to Node 2	The file contains only one node - The content of the file is imported to the second node in the Assistant. The configuration of the first node remains intact.

Compatibility:

Existing experiments do not require revision. The importing procedure still works as before. For importing purposes, the following selection is used: "*One or two nodes: as defined in file*".

Menu item: "Import/Export":

By means of this menu item, you can also import MFB-configurations. Here, the same options are available for your use.

5.11.4 imc Inline FAMOS



More flexible sample window width for moving functions such as max, min, etc.

The maximum ratio of window width to reduction width has been increased to 1000:1 (previously 10:1); for the functions: "max", "min", "mean", "rms" and "stdev".

5.11.5 Installation



Limiting the installation options

For the driver and firmware package for imc STUDIO (imc DEVICES), only such components are still offered which are used in imc STUDIO. The following components are no longer installed:

Option/Component	Description
COM-Interface	Installation of the ActiveX components
imc Online FRAME	Installation of the imc Online FRAME Workbench with Compiler
CAN Database - Import	Vector database linkage, DBC-Format. Activation via software is not supported under imc STUDIO. Perform the activation for each device separately.

New name for the selection option imc DEVICES

In order to make it clear that the firmware is required for use of the imc devices, the name in the product selection list has been modified:
"Firmware and driver package imc DEVICES (CRONOS, C-SERIES, SPARTAN, BUSDAQ)"

5.11.6 Miscellaneous optimization

Alongside bug fixes, the following important improvements have also been implemented:

Area	Description
User interface partially frozen	General bug fix! The most recent few versions manifested a certain error in various ways. This included that some user interfaces were not displayed correctly, or that the software is categorically inoperable. The error frequently occurred when going from one main window to another; e.g. from Sequencer to Panel. In such cases, an entry was made to the logbook files containing the note "PresentationCore". The error occurs since the update of an external component. It has been possible to localize the error and to remove some of its causes. For example, the sliding animation when showing certain docked tool windows caused the problem; this has now been deactivated globally. If you still observe this behavior, please contact us directly. Please make note of the last few actions which you had taken before its occurrence: • which main window had been changed, • which tool windows were present, • which tool windows had been opened. If no windows were active, then please specify what action you had most recently performed. Even if you were not able to reproduce the error. This will assist us in tracking down the error.
Setup - The state of data storage	The option "Data storage state after download" did not work correctly. The state only changed correctly if a preparation of the device was required upon starting measurement. Now the state is also set correctly when the menu item "Reconfigure" is executed.

Area	Description
Setup - Diskstart: wrong configuration loaded	When connecting with a running Diskstart measurement, the correct configuration was not loaded in the following case: any additional changes to the device configuration were performed after creation of a Diskstart configuration and written to the device upon "<i>Download</i>".
Setup - Device search for video devices	When video devices were successfully found in consequence of a device search, the dialog indicating "no new devices found" was still displayed unless any new imc devices were also found. Now the dialog only appears when none of the devices named was found.
Setup - Profinet-Editor	The Profinet-Editor is now displayed correctly even with larger font sizes and higher resolution.
Panel - Curve window	Text format: In the selection list, some text formats have been renamed; e.g. imc DEVICES was removed from the name. New names: - CAN, LIN message 4 Byte abs. time 3-number sets (hex) - Flexray message

5.12 imc STUDIO 5.2 R14

5.12.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.12.1.1 Firmware imc DEVICES 2.13R5

Hardware



PROFINET-IRT

The new Fieldbus-module "PROFINET-IRT" can be used with this version.

Fieldbus



CAN - Support of the format ARXML

Devices having a CAN-FD interface support the ARXML-format (AUTOSAR XML). Due to this, the device is able to process PDU-oriented messages.

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Fewer Start-Menu items	For the driver and firmware package for imc STUDIO (imc DEVICES), dedicated Start-Menu items are no longer created.

5.12.2 Sequencer



Sequencer-output to Logbook - Reducing entries

When you run the Sequencer, many commands make entries to the logbook. By means of these entries, you have a way to analyze the background of situations in the signal. For example, which commands started right before a problem occurred, or in what loop the routine was working at that time.

In the Options under the item "Sequencer" there is a new option "*Reduce Logbook-entries*". When you activate this option, the following Sequencer-messages **no longer appear in the Logbook window** and are not written to the logbook file:

- Start/End command
- Messages on loops (For/While)
- Messages on case distinctions (If/Switch).

This provides the advantage that more important entries in the logbook may be noticed sooner.

5.12.3 Commands



imc FAMOS - Variables-list

Input support for the measurement name has been revised and extended

Background info: Input support is available for the measurement name: Click in the input box after the channel name on keyboard combination: <CTRL> + <SPACE>. A list of various input choices appears.

The choice: "@Last concluded measurement" has been deleted. Conversely, the following have been added:

- @LastMeasurement: corresponds to "*Last concluded measurement*"
- @CurrentMeasurement: corresponds to: "*Current measurement*"

5.12.4 Panel and Data Browser



Data Browser - Display of only the most important columns

The **columns displayed** have been limited to "**Name**" and "**Unit**" of the variable. The columns "*Event time*", "*Comment*" and "*Category*" have been hidden. You can show them again at any time by means of the column chooser and save them in the view.

This is a change of the view; thus the change has no effect on existing databases.

Panel page on the monitor

When a Panel page is displayed on a **second monitor**, this page layout is **saved in the experiment** and restored upon subsequent loading. If the monitor is no longer present upon loading, the page appears again, embedded in the Panel.

5.12.5 Automation



Automation - Renaming variables in imc FAMOS sequences

When elements are imported from the Clipboard or the task is transferred to a different device, you can **automatically rename** the **variable name** in these elements. This function now also takes effect on imc FAMOS sequences (data cutting). The **In/Out variables** are now replaced. The sequence and the imc FAMOS-variables are not taken into account.

5.12.6 3rd-party devices



3rd-party devices trigger user-defined events

Variables in 3rd-party devices can now trigger user-defined events; e.g. it is possible to make the system responds to a value change in the variable.

5.12.7 imc Online FAMOS and imc Inline FAMOS



imc Online FAMOS and imc Inline FAMOS - functions: min, max, mean

In the control command `OnTriggerMeasure`, the functions "*min*", "*max*" and "*mean*" no longer accept any single values for their 1st parameter. Since this control command is missing any time reference for single values, this function may only be applied to channels which provide time information.

In imc Online FAMOS, in the constructs `OnTimer` or `OnSyncTask` the function can still be applied to single values. For purposes of the calculation, the function remembers the last values (*window size*) in order to return a result. The last values are derived from the points in time when the function is called; e.g. in the construct `OnSyncTask`, once per second.

5.12.8 Miscellaneous optimization

Alongside bug fixes, the following important improvements have also been implemented:

Area	Description
Installation - documentation	Some older versions install the documentation with a write-protection attribute. Later versions then did not install their own respective newer documentation. Now the attribute is corrected for proprietary imc documents upon installation and the new documentation is installed.
Project management - Experiment-extensions	When you use imc STUDIO without project management, the experiments are assigned the extension: ".imcExp", instead of ".imcStudio". When you go back to the project management, or if you wish to open these experiments on a different PC having project management, then this file type is now also accepted and can be imported without any workarounds.
Setup - Synchronization	With some devices having serial numbers 12xxxx, "IRIG" was offered as the synchronization signal output even though this output type is not supported.
Setup - External editors e.g. KMT or RoaDyn	You can now delete external editors from the experiment by clicking on the button " <i>Manage external editors</i> ". You must previously have added the button to your view via " <i>Modify menu ribbon</i> ".
Setup - Firmware-version selection	If you have installed multiple versions of imc DEVICES, you can now change versions for multiple devices simultaneously in the firmware version selection dialog.
Setup - device name	Duplicate device names are no longer permitted, since under some circumstances they caused problems, e.g. with the automatic name extensions for channels. Existing experiments can still be used.
Command - Variable export	Exporting from a saved measurement - When ASCII (csv/asc) or XLS was selected as the target format, export failed and a warning was posted: " <i>No data selected for saving.</i> " Now export to these data types also works from a saved measurement.
Window size in the Events-dialog, e.g. of Panel-buttons	The default size of the Configuration window has been increased and no longer is adjusted to the column width. The system remembers the size for each command for the duration of the running instance. This doesn't depend on where the command configuration is opened (e.g. Sequencer, Widget).

Area	Description
Widgets	Widget: Standard meter: When the factor is set to "automatic", the scale values are set accordingly following a change of the value, however the factor displayed had previously not been modified accordingly.
Automation	When a Automation-configuration available in the device was changed while there was an existing connection to the device, then upon processing the configuration, the error "<i>Unable to access deleted row information via the row.</i>" was reported. This problem occurred when elements were deleted from the existing configuration and then inserted again (e.g. a state was moved to a new element (branching, step) by means of Drag&Drop.
Scripting	- The following process has been accelerated: Writing a device variable using "<i>SetContent</i>", without that the value changes. - Removal of a script from the Panel pages properties was not saved. After loading the experiment, it is now no longer present.

5.13 imc STUDIO 5.2 R13

5.13.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.13.1.1 Firmware imc DEVICES 2.13R4

imc Online FAMOS



imc Online FAMOS supports Accu-functions

The Accu-functions are now also available in imc Online FAMOS. By means of these functions, you can determine the minimum, maximum, mean value, RMS-value, standard deviation and length of the input signal over the entire measurement duration.

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
imc BUSDAQflex with WLAN	When " <i>WakeOnCAN</i> " was activated, the " <i>falling asleep</i> " process went too slowly when the connection was via WLAN. The falling asleep has been accelerated and there is now no difference between LAN- and WLAN-connections.
Synchronization: PTP	The option " <i>SlaveOnly</i> " was not reset when the device was later defined as " <i>Master only</i> ".

5.13.2 General changes in imc STUDIO



Logbook

Each time an entry is made to the logbook, information is saved in a logbook file. A new file is created each time the program is started. This means that after a certain amount of time very much hard drive memory may be used up.

In general, the data in very old files are no longer necessary. So now there is a new option for performing a cleanup of the logbook folder: "*Delete logbook-files*". After the specified number of days, the logbook-files are deleted automatically (default: 30 days). The verification test is performed upon each start of the program, or a 12 midnight if the program is currently running.

Additionally, logbook files are now each saved in a separate folder for each day.



Setup - Saving metadata with a Diskstart configuration

Regarding: "*Meta-data in Channels*". You are able to save metadata about the channel. This applies to saving to the PC as well as to on the device.

This previously was not applicable to Diskstart. Now, the metadata are saved with the channel upon a Diskstart. The metadata which are used are such which were available at the moment in time when the Diskstart configuration was created. Subsequent editing of the metadata is not possible.



Widgets - calculations with units

New behavior of the Widgets "*Table*" and "*Numeric Input*" belonging to the groups: Automotive, Industrial and Designer.

1. Certain units containing a factor, e.g. "*kg*" are now converted in calculations. Other units which by chance have the same initial letter as a factor are no longer processed in this way; for instance "*Gallon*", where the "*G*" is no longer interpreted as "*giga*".
2. Using the Widget-property "*Factor*", you can specify the target factor, even if the variable's unit is "*kg*", for instance. Correct conversion to grams or tons is performed. By means of the factor "*1*", the exact unit entered is outputted.

The same applies to many other units.

Example: The unit is set to "*kV*", the value to "*0.005*". If the factor is set to "*1*" or to "*kilo*", the Widget displays "*0.005 kV*". If the factor is set to "*milli*", then "*5000 mV*" is displayed. For "*Automatic Formatting*", the displayed output is "*5 V*" (the factor selected by the system then depends on the magnitude of the value).



imc FAMOS-command - Transferring variables from different measurements

Often, additional parameters are required for the purpose of evaluating saved measurement data. Such parameters are recorded along with the variables under "*Current Measurement*". Using a imc FAMOS-command, you can transfer variables both from a measurement and from "*Current Measurement*".

To imc FAMOS

From imc FAMOS

Options

Transfer variable to imc FAMOS

Source location:

Last completed measurement

imc STUDIO variable		imc FAMOS variable
Channel_001		Channel_001
DisplayVar_01@CurrentMeasurement		DisplayVar_01
DisplayVar_02@CurrentMeasurement		DisplayVar_02
DisplayVar_03@CurrentMeasurement		DisplayVar_03

In this example, a measurement is selected. Additionally, variables from "*Current Measurement*" are transferred. In this case, use the following syntax for the imc STUDIO variable:

<VariableName>@CurrentMeasurement or <VariableName>@Measurement#0

Example: *DisplayVar_01@CurrentMeasurement*

5.13.3 Miscellaneous optimization

Alongside bug fixes, the following important improvements have also been implemented:

Area	Description
Setup - Balancing times displayed incorrectly	In many cases, the balancing time displayed changed by itself by one hour. This happened upon loading an experiment, when changing measurement ranges, or upon importing a parameter set. Now, the correct times are indicated. Note: Old entries and files still indicate the wrong time; if the shifted time is already saved with the experiment, it will remain that way, but it will not change any more. Old parameter sets still reflect the wrong time. But with a newly saved parameter set, the correct time will remain intact even upon importing.
Options - Setup-dialog responses	You are able to pre-define two additional dialog responses for automated processes. The additions are <i>"Supply settings changed"</i> (when the supply voltage is changed) and <i>"Channel settings will be reset"</i> (e.g. for resetting of balancing values).
imc Online FAMOS and imc Inline FAMOS Editor	- When the IF-function was inserted from the Function window, the <i>"END"</i> was not indented properly. - The Function Assistant did not generate any curly brackets around the parameter names when they contained special characters.
Command: Export Variable	File overwrite confirmation prompt upon exporting: When exporting in the dat-format, you can check the respective box to choose whether to overwrite all files or none. This has now been implemented for all other file format. When multiple file formats are exported together, the checkbox applies to all formats.
Automation	Routines involving events in the Automation have been stabilized. Occasionally, an event had no conclusion, so that the task froze at this location.
imc STUDIO Monitor	The options for Monitor were not saved and took no effect. Now you can once again use the options <i>"Write single values"</i> and <i>"Autoselect channels"</i> .

5.14 imc STUDIO 5.2 R12

5.14.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.14.1.1 Firmware imc DEVICES 2.13R3

Fieldbus



CAN-Assistant - pv-variable as Send-message

You are now once again able to select a CAN receive-message's pv-variable as a send-message. Thus for instance, you can directly send a received message on a different node.

CAN-Assistant - OBD2 - Updated PID-list

For the OBD2-protocol, the PID-list has been revised to meet the standard SAE1979 (2017/2019). The following channels have been added: PIDs 8E, 8F, 9*, A* and B0.

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
GPS-receiver	Information about the GPS-receiver is displayed in the dialog "Device-Properties"; e.g. the identifier and the version.
imc Online FAMOS - Editor	When executing the menu item "New", the standard control commands are restored when control commands are activated.
CAN-Assistant	Improved ARXML-import: Factor and offset - Under some circumstances, following an import the factor and offset had incorrect settings. In some cases, the ARXML-file contains multiple scaling values, which caused the correct factor and offset values to be overwritten. Now, the correct values are imported. Improved A2L-import: Long event names can now be used - A2L-files contain both short and long event names. For the purposes of processing and display in the CAN-Assistant, only the short event names have been used to date. In certain A2L-files, however, the short event names are not always unique. In this case, not all events can be displayed in the CAN-Assistant. Now the long event names are processed upon importing.

5.14.2 Setup and Device Control



Device search via the context menu

On the Devices-page, the context menu has been supplemented in the area of device searches. This makes the functionality quickly accessible and avoids needing to browse through the menu ribbons.



Strain gauge configuration

The strain gauge diagrams have been revised to reflect their current response to the arithmetic sign. Additionally, certain errors in the representations have been resolved.

Channel nameChannel_001

CouplingPoisson half bridge

Resistor120 Ω

ModeStrain

Bridge factor N1 + ν

Gauge factor2

Unitμ eps

Transverse strain coeff. ν0.3

Modulus of elasticity E

Input range±7600 μ eps

Half bridge with 2 active strain gauges. One strain gauge along main expansion, the other transverse to it. Exploits transverse contraction while providing good temperature compensation.

$$\frac{V_{IN}}{V_B} = \frac{N}{4} \cdot K \cdot \epsilon$$
$$N = 1 + \nu$$

5.14.3 imc Online FAMOS and imc Inline FAMOS



imc Online FAMOS and imc Inline FAMOS - functions in conditions

When a function (e.g. "Greater") is used in a condition, an assignment is no longer absolutely necessary.

Previously, only the following syntax was allowed:

```
If Greater(Current_RPMs, 2200) = 1
```

Now the following alternative is also possible:

```
If Greater(Current_RPMs, 2200)
```

imc Online FAMOS and imc Inline FAMOS - calculation results in conditions

If the result of a calculation is always certainly a Boolean value, the variable can be used in the subsequent conditions without any assignment, as if it were a bit-variable.

Previously only the following syntax was allowed:

```
a = b > c
If a = 1
```

Now the following alternative is also possible:

```
a = b > c
If a
```

The variable "a" is a local variable which is created in `OnInitAll`. "b > c" always returns either 1 or 0 as its result.

Even if the variable contains non-Boolean results at other locations, it can be used in this case.

This behavior only applies to local variables and not for device variables.



imc Inline FAMOS - variables in condition

The following change applies as of this version:

Bit-variables now no longer absolutely require a comparison operator (=) in the IF-function. The following code can now be used:

"`IF VB_Switch_1 AND VB_Switch_2`" or "`IF VB_Switch`". The prerequisite is the use of variables of the type "Bit". Virtual Bit, Ethernet-Bit, CAN-Bit, ...

The use of fieldbus-bits had only been implemented for imc Online FAMOS. This has now been extended to imc Inline FAMOS.

imc Inline FAMOS - BitNot with new parameters

The function `BitNot` with a new optional parameter for the data format.

With this parameter, you specify into which integer data format the number is to be converted previously. 8, 16, 32 signed bits 1-bit (digital). The original notation can continue to be used and existing source code does not require revision.



imc Online FAMOS Syntax Highlighting

The Syntax Highlighting for the functions "Till" and "Step" did not work in the Editor; e.g. `For i = 1`

```
Till 100 Step 1.
```

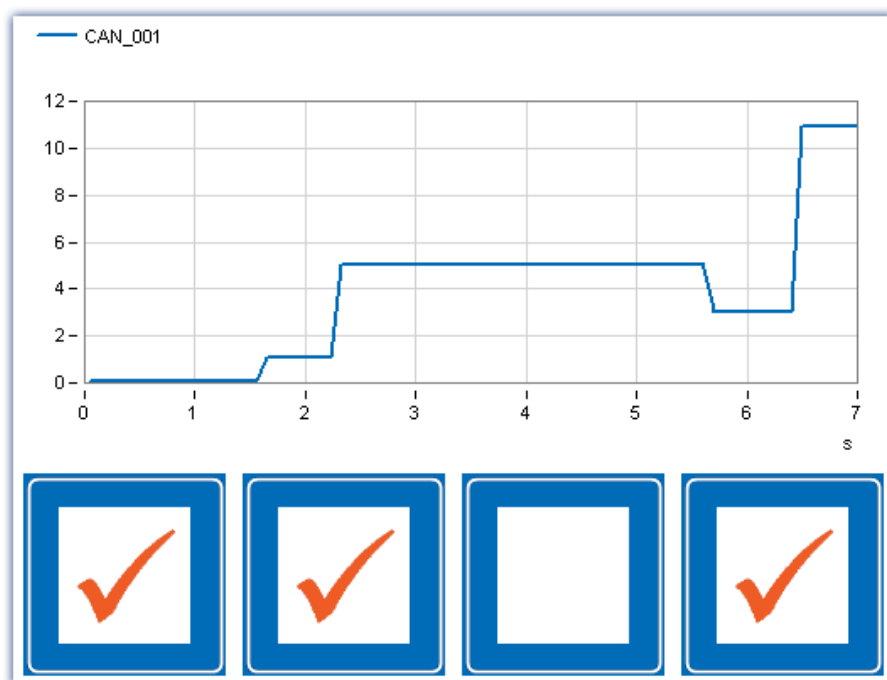
5.14.4 Panel, Widgets and Data Browser



Status display in individual bits of variables - Graphics switch

Using the property: "*Bit mask*" you can select which bit is to be displayed. When the 1st bit is selected, the Widget only displays the value of the 1st bit. In this way, state indicators on the Panel page provide a good overview of various channel states.

This function is now also possible in conjunction with the graphics state switch. In this way, you can use your own personal graphic for the states.



A Fieldbus channel returns multiple channel states at one time. In the end, the bits 0, 1, and 3 are set for a total of = 11.



PDF with incorrect typeface results

The typeface in the "*Input box*"-Widget looked more "bold" in a PDF or in a printout than on the Panel.

"Printout font" is a topic which we can only improve in stages. imc STUDIO passes the page layout information to the user's setup's default printer, which then produces the PDF or the printout. Thus, we have little influence over the results, which depend strongly on the printer driver.

If you still have problems in this matter, please contact our tech support with detailed info on your default printer.

5.14.5 Miscellaneous optimization

Alongside bug fixes, the following important improvements have also been implemented:

Area	Description
Project management - Save Experiment As	When you save the current experiment under a new name, the experiment is reset so that the variables are assigned their respective initial values (e.g. Device Variables = "0", or user-defined variables get the specified initial value). The event " <i>Experiment_Loaded</i> " is triggered.
Project management - Creating a project	When you create a new project, the status of the experiment currently open is saved temporarily and reloaded later after the new project has been set up. In consequence, the values of the variables are reset to the condition they would have if the experiment were reloaded. In the process, the event "<i>Experiment_Loaded</i>" is not triggered. If you need this to happen for your experiment, please re-load it manually.
Command: IF	Among the comparison operators offered, "Unequal" (!=) did not appear in the list. This choice was missing from the list, only. When it was entered manually, it worked just as before.
Command: imc FAMOS	The command has been supplemented with the option " <i>Always overwrite existing files</i> ". When results are saved along with the measured data, a message appears if any file in the folder has the same name. Using this option, you can always have the file overwritten by default.
Panel - Curve window	When the curve window was associated with a measurement via a measurement number, then if the experiment was saved under a different name or if the Panel page was copied, certain settings affecting the X-axes were reset. For example, the scroll mode and the axis scaling were reset.
Setup - RoaDyn2000	Automatic name assignment improved. When the Editor was opened again, the channels names appeared with an extension indicating the device name, even though this was not necessary. Now the name assignment is only performed if the channel name already exists, e.g. when using two slots.
Setup - fos4X	fos4X third-party devices can no longer be selected.
Scripting - Script import	You can now import scripts by means of a menu item in all editions. The menu item does not appear in the menu ribbon of the Standard-view. For this reason, you could add the menu item to the menu ribbon and then save the view ("Customize Ribbon" is not possible in the Runtime-edition). The menu item can be denied to individual user groups by means of setting the access privileges accordingly.

5.15 imc STUDIO 5.2 R11

5.15.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.15.1.1 Firmware imc DEVICES 2.13R2

Hardware



CRFX/WFT-2 with pv-variables

For the WFT-2 amplifier's channels, the pv-variables are now available. These can be activated on the Setup page "Variables".

TEDS - Importing the measurement range

The system can read and import a measurement range from the TEDS.

Fieldbus



CAN-Assistant - CAN channels not in log channel

Optionally, transmitted CAN channels can now be switched off in the log channel. If switched off, also in the imc Online FAMOS function `OnCanReceive` transmitted channels are not detected.

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
CRFX/UNI-4 temperature measurements	The monitor channel displayed wrong values for temperature measurement. For example 0 °C for a Type K measurement.

5.15.2 General changes in imc STUDIO



imc Online FAMOS and imc Inline FAMOS

When a variable name contained a special character, it was not always possible to use the variable in the IF-function.

The code `"IF {VB_Switch-} = 1 AND {VB_Switch+} = 1"` caused a syntax error.

Bit-variables now no longer absolutely require a comparison operator (=) in the IF-function. The following code can be used:

`"IF VB_Switch_1 AND VB_Switch_2"` or `"IF VB_Switch"`. The prerequisite is that variables of the type "Bit" are used. Virtual bit, Ethernet-bit, CAN-bit, ... (CAN-bit currently not yet in imc Inline FAMOS)



Setup - Export of adjustment values

When parameters which are relevant for adjustment are imported, inconsistent states can occur if not all parameters for the adjustment are appropriate. E.g. if only the compensation values are imported.

This remains true, but now when these values are exported the system ensures that all adjustment information is available when one of these relevant columns is exported. Clicking on the button: "Export configuration" causes a selection list offering multiple exporting alternatives to appear:

Parameter set export

What should be exported?

- ☐ All columns of tables on current page
- ☐ Visible columns on current page
- ☐ Selected columns of the current page
- ☐ Selected columns and rows of the current page
- ☐ Balancing settings
- ☐ Choose columns manually

OK Cancel

The five options within the selection frame above also export the adjustment information as soon as a relevant adjustment column is included. This function has been newly implemented in the three highlighted items.

The possibility to edit the export file manually still remains, but in consequence, the adjustment information may become inconsistent.



Editing Panel pages linked to privileges

It is now possible to link the right to edit Panel pages with user privilege levels. Certain pages are then protected while others are not.

With the access rights level "Panel" it is possible, for instance, for even the "imc Standard User" to create or import custom pages (by default, this is refused). However, for this user level it had previously been illegal to also edit this page.

Now the rights to the individual page depend on the respective user level. Thus, an "imc Standard User" who creates a page also has the right to edit and delete it. If a user on a different level creates the page, then these rights remain with an "imc Advanced User".

5.15.3 Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description																		
Experiment management	When an experiment is not saved after having been created, then all files belonging to the experiment are now deleted. One example: The action "New Experiment" is executed. A device is selected and the measurement started. Subsequently, imc STUDIO is closed and "Don't save" is selected in response to the prompt. In this case, the experiment is deleted along with all measured data, since it had not previously been saved. In the prompt to save, there is a notification that the measured data will also be deleted. Once the experiment has been saved or import from an existing experiment has occurred, the experiment is safe in the database, even if not saved upon closing imc STUDIO.																		
Project management	Variables having the validity scope "Project" were not loaded when a database/project needed to be converted. This applied, for example, to the update from 5.2 R9 to 5.2 R10. After updating from 5.2 R9 to 5.2 R11, all variables now appear correctly.																		
Setup - Limitations to strain gauge channel measurement ranges	The system failed to limit the available measurement ranges for strain gauge channels. Many measurement ranges were offered which were not technically possible. Example: For the mode: "Full bridge with Poisson strain gauge in opposed arms" <table> <tr> <th>Previously provided</th><th>Limited to the correct range</th></tr> <tr> <td>700 µm/m</td><td>700 µm/m</td></tr> <tr> <td>1500 µm/m</td><td>1500 µm/m</td></tr> <tr> <td>3800 µm/m</td><td>3800 µm/m</td></tr> <tr> <td>7600 µm/m</td><td>7600 µm/m</td></tr> <tr> <td>15000 µm/m</td><td>15000 µm/m</td></tr> <tr> <td>38000 µm/m</td><td></td></tr> <tr> <td>...</td><td></td></tr> <tr> <td>760000 µm/m</td><td></td></tr> </table> For conversion of the existing experiments, there are no steps needed. Internally, the system already applied the correct measurement ranges. Thus, only the display in the column now also reflects the correct value. The measurement ranges are thus the same as before.	Previously provided	Limited to the correct range	700 µm/m	700 µm/m	1500 µm/m	1500 µm/m	3800 µm/m	3800 µm/m	7600 µm/m	7600 µm/m	15000 µm/m	15000 µm/m	38000 µm/m		...		760000 µm/m	
Previously provided	Limited to the correct range																		
700 µm/m	700 µm/m																		
1500 µm/m	1500 µm/m																		
3800 µm/m	3800 µm/m																		
7600 µm/m	7600 µm/m																		
15000 µm/m	15000 µm/m																		
38000 µm/m																			
...																			
760000 µm/m																			
Setup - Importing strain gauge adjustment values	The incorrect strain gauge measurement ranges (see previous item) caused the system to sometimes fail to import the adjustment values. This error has been resolved by not offering the ranges affected.																		
imc Application Module-editors	Editors are now checked for compatibility upon loading the experiment. The imc Application Module-editors are designed for a particular imc STUDIO-version and can only be used in conjunction with it. When you use your own external (incompatible) editor, a notification to update the editor appears after loading.																		
Curve window	Numbers displayed in the format: "Hexadecimal" flickered. Sometimes the numbers were completely hidden.																		

5.16 imc STUDIO 5.2 R10

5.16.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.16.1.1 Firmware imc DEVICES 2.13R1

Hardware



imc CRONOS-XT

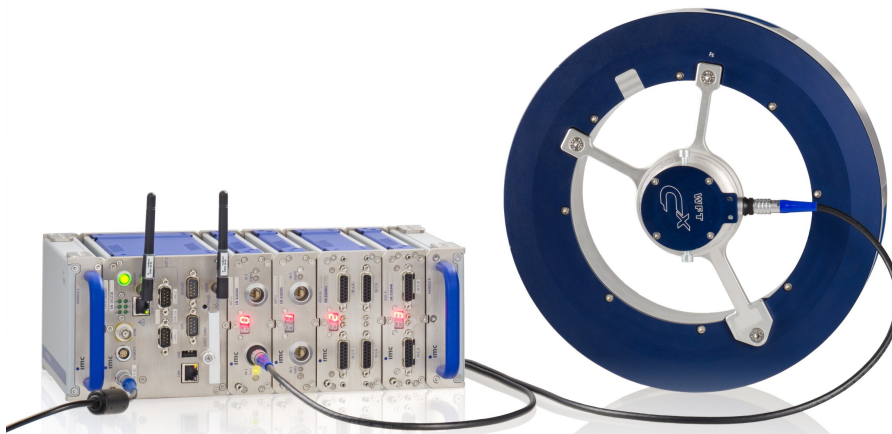


Measurements under special ambient conditions such as heat, cold, splashing water and vibrations require suitably protected measuring systems. The imc CRONOS-XT meets these requirements while maintaining maximum flexibility and modularity for the user during configuration of the system.

Operation of XT series devices requires this software version.



6-component wheel force transducers - WFT-2 for imc CRONOSflex



The WFT-2 is a imc CRONOSflex module for the acquisition of two WFT sensor systems.

In motor vehicle development, 6 component wheel force transducers (WFTs) are used to determine and record forces and torques at the wheels during test drives – in all three dimensions, resulting in 3 forces (F_x , F_y , F_z) and 3 torques (M_x , M_y , M_z). The measurement results generate the data used for computer simulations or as input parameters for test rig systems.

5.16.2 General changes in imc STUDIO

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
imc Inline FAMOS and imc Online FAMOS	The function " <i>IntegralFFT</i> " generated an incorrect unit for the results channel. If the input channel had the unit "V", the results channel now has the unit "Vs" instead of the previous "V/s".
imc Inline FAMOS	Whenever the " <i>Greater</i> " function is used in a condition, an explicit assignment is now always required. Just like in imc Online FAMOS. Previously, the following alternative syntax was also possible: <code>If Greater(Current_RPM, 2200)</code> Now only the following syntax is permitted: <code>If Greater(Current_RPM, 2200) = 1</code>
Scripting	Upon exporting scripts, the system again saves data in the normal unpackable zip-format.
Powertrain Monitoring	The Powertrain Monitoring-DLLs were not installed. In consequence, the components did not work if not created with previous versions.

5.17 imc STUDIO 5.2 R9

5.17.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.17.1.1 Firmware imc DEVICES 2.11R9

Fieldbus



CAN-Assistant - Importing ARXML files

The "ARXML" formats associated with the development partnership "AUTOSAR" (**AUT**omotive **O**pen **S**ystem **AR**chitecture) can now be imported.

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Devices with incremental counter modules	After updating to the firmware version 2.11R8 (imc DEVICES), devices equipped with incremental counters could experience an error (timeout) in accessing the I2C Bus.
imc Online FAMOS	Some configuration possibilities for the function " VibrationFilter " caused an overflow message to occur during measurement.
Synchronization with GPS	GPS receivers from the company GARMIN returned an incorrect date as of 4/6/2019. The firmware of imc devices now corrects this error for all GARMIN receivers of the type 18x 5Hz which use the firmware version 4.0. With older GARMIN models, there is a residual possible discrepancy of a few seconds.
CAN-Assistant	When importing ECU-XCP channels from an "a2l"-file, the dots (".") in the channel's name were previously changed to an underline ("_"). Dots are now allowed in channel names and are no longer converted. Exception: In order to avoid confusion with pv-variables, channel names beginning with "pv." are renamed to "pv_".

5.17.2 General changes in imc STUDIO



The Quick Access toolbar is saved

The Quick Access toolbar's state is now saved along with the views. If you have made any changes, they are detected. If the view has not been saved yet, you are notified about this upon closing imc STUDIO.

Defining Logbook filters for the program start

You can pre-configure the filter settings using the option. Thus for example, you can have certain information entries hidden by default. Such entries can later be displayed again if needed without affecting the default setting. This option is applicable to a specific project.

About-dialog shows AddOn version

The About dialog provides information on whether an imc DEVICES AddOn is used. Previously, only the "Build Date" was indicated. Now the date of any AddOn present also appears.



Sizes of Assistant windows are saved

The position and size of the various Assistants are now saved for subsequent sessions. Thus for instance, the imc Online FAMOS-Editor starts in the same position where it was when last closed.

This applies to all Assistants such as CAN, LIN, imc Online FAMOS, Synthesizer, ...



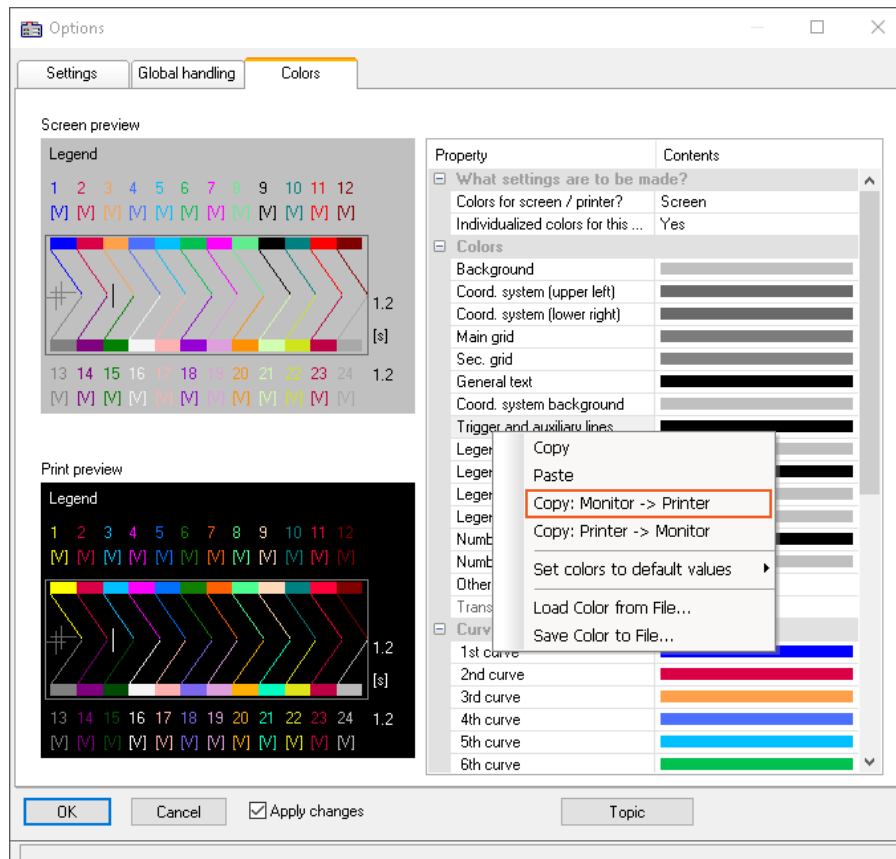
Curve window colors

The curve window colors can be configured separately for the screen and for printout. However, for the printout, the correct colors were not used; for example, when Panel pages were printed out, the curve window was assigned the colors designated for the screen but not those for the printout. This applied to both Report- and Dialog-pages.

Now, the printer colors are used for the printout.

This affect existing experiments; since the correct colors are now used, the printout results may appear differently if other colors are set for it.

Remedy: You can recreate the same results as before by applying the screen colors to the printout.



The colors are now used as follows:

Dialog-page

On screen: Screen colors

In the printout: Printer colors

Report-page

On screen: Printer colors (the Report-page is designed for printout or for PDF. In consequence, the printer colors are used here.)

In the printout: Printer colors

5.17.3 Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Setup	Disconnecting and re-connecting - Problems with saving a Fieldbus log channel. When the system disconnected from a running measurement and resumed at a later time, the saving of the log file did not restart. Importing supplemental files - When a supplemental file was imported in an already (re)configured device, the connection status changed to "<i>disconnected</i>" and was thus inconsistent with its real status. Now the status remains "<i>connected</i>". Deleting balancing - When balancing was deleted via the context menu ("<i>Remove balance/scaling information</i>"), some information remained in force; e.g. the "<i>Balance compensation 2</i>". Previously, calibration by the manufacturer needed to be performed. Now it is sufficient to delete via the context menu.
Widget: Graphical switch	The graphical switch caused substantially increased demands on the CPU. Various effects were observed when the switch was used. For example, some properties could no longer be changed and some windows no longer opened.
User-defined events	- In the selection of variables, user-defined variables having their own categories were not displayed correctly. They were all designated "<i>User-defined</i>". Each category and sub-category now appears with its own correct name. - Events were not triggered correctly if the associated variables' names were not spelled correctly regarding case sensitivity. Now the spelling is case-insensitive.
Data Browser	Renaming measurements: Illegal characters and reserved folder names (such as " <i>config</i> ", " <i>CON</i> ", ...) are now detected immediately upon being entered. When you try to confirm your entries, an appropriate notification is posted.

5.18 imc STUDIO 5.2 R8

5.18.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.18.1.1 Firmware imc DEVICES 2.11R8

Fieldbus



CAN-Assistant - Messages larger than 4 Bytes

Data units larger than 4 Bytes can be transferred in multiple CAN-messages. The prerequisite is the use of a suitable ECU-protocol: "*UDS*", "*KWP2000*" or "*Diagnostics On CAN*".

imc Online FAMOS



imc Online FAMOS-functions - Converting units

The following functions can now convert units: "IntegralP", "IntegralP2", "Integral2".

Using the external editor

Support of external editors such as "Notepad++" has been re-introduced. It is recommended to continue to use the imc Online FAMOS-editor. Familiar help functions such as syntax-highlighting or accessibility tools are not supported but might be possible to pre-configure in the external editor itself.

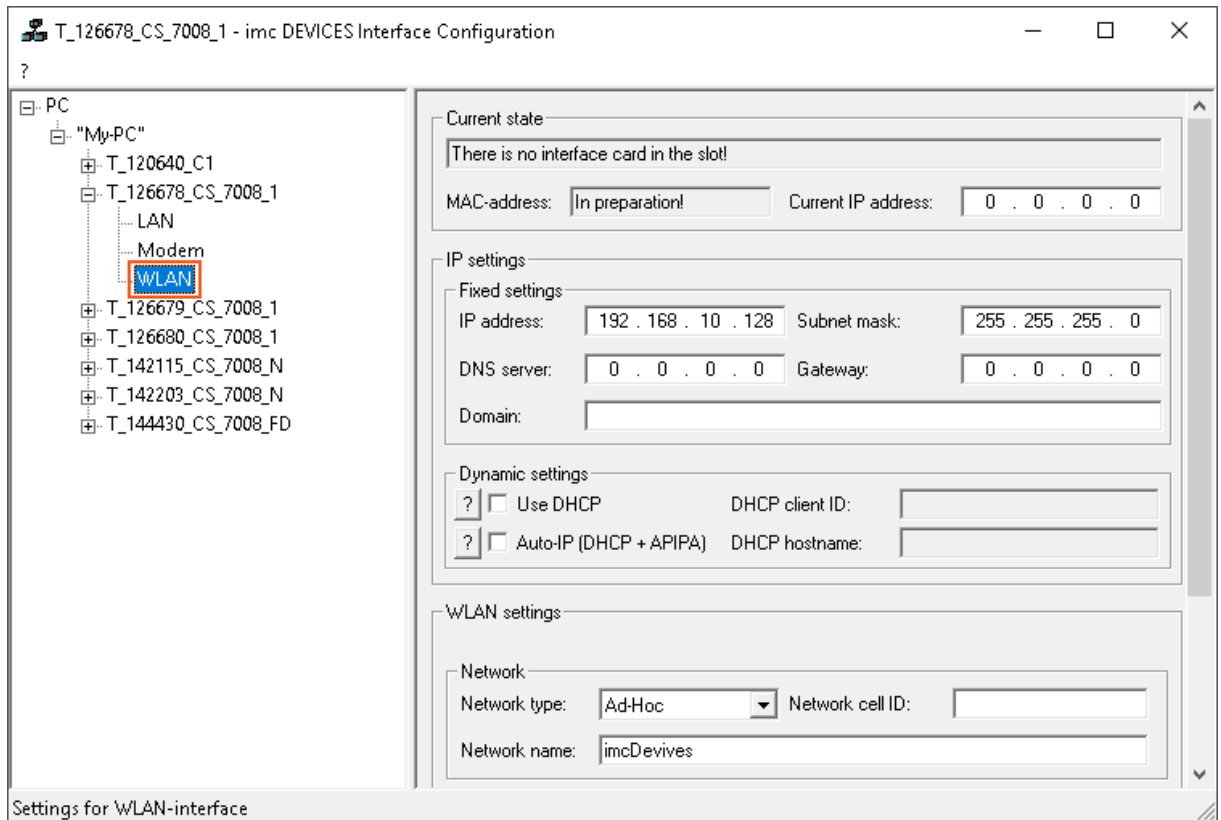
The properties of the respective editors, such as how to close the editor without first explicitly saving, must be taken into account. With "Notepad++", it is possible to retain changes which have not yet been saved in this way. This can lead to complications.

Interface Configuration



WLAN-configurations easier to locate

It is easier to find the WLAN-configurations. The page "PCMCIA" has been renamed to "WLAN".



Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
CAN-Assistant - OBD-2-channels	The substitute values were handled incorrectly. Any specified offset was ignored.
Flexray Assistant	Incorrect ECU entries often caused incorrect message to be posted: <i>"slotMatrix.AddAllowedXcpFrame() failed. 2nd"</i> . Now, appropriate information for locating the error is provided.
imc Online FAMOS/imc Inline FAMOS - Editor	Improvement of the Editor's search function. The search function (CTRL+F) now remembers the last search term.
DAC scaling	DAC scaling was not applied. If the DAC was set in imc Online FAMOS, the new value was outputted at the output one-to-one. Now, the scaling set is applied.
imc HiL	Very large imc HiL-files/configurations could not be loaded. The error 5001 was reported: <i>"The fieldbus system did not confirm the command in time."</i>
Zero signal level with UNI2-8/DCB2-8	At a sampling frequency of 0.1 Hz and activated AAF, all frequencies were filtered away. Thus, a zero level was always outputted. Now, the AAF is allied correctly.

5.18.2 General Changes in imc STUDIO



Module serial number for CRFX-modules is displayed and is available for export

Setup page: *"Digital channels"*: The column *"Module SN"* can now be added by means of the column selection. Furthermore, this column is included in the export, so that the values are available for modules in the export-file (e.g. the module CRFX/HRENC-4).



Data storage - FFTs are assigned events to rectify time reference

Saved FFTs previously had no events in such cases where, for instance, an overflow occurred. Instead, after loss and subsequent restoration of the connection, any new segments were simply appended to the last one. Now, a new event is generated. This means the new segments are correctly referenced to time.



Device-bits in a Automation-task

CAN-bits and (recorded) DI-bits can now be used in a Automation-task. Thus it is possible to access individual bits.



imc Inline FAMOS-Functions - Converting units

The following functions are now able to convert units: *"IntegralP"*, *"IntegralP2"*, *"Integral2"*.

5.18.3 Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Command: Load/Import Variable	The command could not be run in a certain combination of settings. When placeholders were used for the folder and additionally the option <i>"Load/Import All"</i> was selected, a message incorrectly reporting an invalid character in the filepath was posted.

Area	Description
Curve window	- Scaling of the x-axis (curve window with FFT) always skipped back to "Auto" when loading the experiment. Now it loads correctly. - When multiple channels were moved to the Panel simultaneously using Drag&Drop, and a (standard) curve window was selected, the scroll mode was set to "No". Now it is set to "Scroll", as for a single channel. - The level indicator failed to apply the correct measurement range when the channel was in the measurement mode: "Strain Gauge" ("Meter" > "Miscellaneous" > "Physical value $\pm 100\%$").
Data storage	Messages indicating data overflow in empty channels are no longer displayed. When an empty imc Inline FAMOS channel was saved, a data overflow was reported; e.g. if the channel was calculated in an IF-branch which never was run.
Automation	In a certain case, activated synchronization was not observed (Synchronization: wait until event is concluded). The system skipped straight to the next state even if a command was not yet finished. This occurred whenever, before a change was applied, a synchronized event had previously only been triggered once in the routine.
Experiment-template with commands	When starting imc STUDIO, an experiment template is loaded automatically. If the template contained a command "Browse in workspace" attached to a Panel-button, the command did not work.
Installation	Using the frame setup, the fieldbusses ARINC and AFDX were not included in the installation for the firmware (imc DEVICES), even if they were selected.
ChannelLoader	Experiments with "ChannelLoader" from older minor-versions could not be opened successfully.

5.19 imc STUDIO 5.2 R7

5.19.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.19.1.1 Firmware imc DEVICES 2.11R7

Fieldbus



DBC-import with a defined default sampling interval

If no sampling interval for a message is defined in the DBC-file, then it was set to a value of 100 ms following the import.

Now the default sampling interval defined in the file is used. Messages which have their own sampling interval retain it.

Device properties



Log file with device properties

Whenever changed device properties are adopted, a text file is generated. The filename was edited accordingly. It now also contains the data and time when last changed, in order to provide traceability:

Name of the file: "*PropertiesLog_<Devicename>_yyyy-MM-dd_HH-mm-ss.txt*"

All information on the device properties currently set is saved as soon as the button "*Apply*" in the Properties dialog is clicked.

Storage location: Firmware folder of the device software, e.g. "*C:\Program Files(x86)\imc\imc_DEVICES_2.11R7\Firmware*".

New hardware supported



imc CRONOScompact/LVDT8

The amplifier imc CRONOScompact/LVDT8 is now supported. It is specially designed for LVDT-measurements (Schaevitz-coils according to the transformer principle and inductive half bridges).

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
GPS channel names	It was no longer possible to rename GPS channel names.
imc Online FAMOS	- Values from the Properties-dialog were not adopted by the variable if they contained one or more apostrophes. - The Restore-function did not appear with color highlighting in the Editor. In addition, the help text was missing.
Re-connection with device	Re-connection with the device following loss of connection (in cases of network problems such as overload or interference) has been optimized. The connection process has been accelerated so that significantly less measurement data now go missing.

5.19.2 General Changes in imc STUDIO

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Menu ribbon not always up-to-date	The menu ribbon buttons as well as the quick access toolbar occasionally did not correctly reflect conditions correctly. In such cases they were out of synchronization with the device's actual state or to with that of other components (e.g. Sequencer [Start/Stop], measurement device status [Start/Stop/Connect/Disconnect]).
Commands > Import Variables	On some device channels, it is not possible to import values from files. These include analog channels, virtual channels, incremental counters, ... Previously, import to these channels was ignored. Now an appropriate warning is posted.
Commands > Import/Load/Export Variables	All entries in the Variables list can be edited simultaneously. E.g. multi-selection can now be used to set the file format for all variables simultaneously when exporting.

Area	Description
Commands > Import parameter set	Import of parameter sets has been made faster in languages such as Japanese, Chinese, ...
imc Online FAMOS and imc Inline FAMOS Editor	The text search has been improved. Adopting text from the selection: Highlight text in the Editor. Open the Search-window e.g. by using <CTRL>+f. The highlighted text is entered and prepared for the search.
imc data format	There is a new version of the imc data format. This version provides some advantages for imc FAMOS. The format can only be generated by imc FAMOS as of version 7.4. imc STUDIO 5.2 R7 is able to read it but not generated. The data calculated by imc FAMOS are displayed in the Data Browser like all other data, if they are saved along with the measured data. With any older version of imc STUDIO, the data can not be opened. In imc FAMOS, you can set the format in which imc FAMOS is to save the calculated data.
Automation - imc FAMOS data cutting	With imc FAMOS, cutting of data belonging to time-stamped channels is not possible in a Automation-task. Previously, the system failed to block attempts to do so. Now, a pertinent warning is issued upon processing of the configuration.
Automation	pv-variables created in imc Online FAMOS can now be used for Automation-value limit monitoring. Possible applications include adjusting boundary values for the task by means of imc Online FAMOS, or monitoring of the pv-variables.
Scripting	You can now use the NTP-parameters in Scripting.

5.20 imc STUDIO 5.2 R4

5.20.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.20.1.1 Firmware imc DEVICES 2.11R2

Device properties



Textfile for device properties

A text file is now created when changing the device properties. All information of the current device properties are saved as soon as the "Accept" button is pushed.

Storage location: Firmware directory of the device software, e.g. "C:\Program Files(x86)\imc\imc_DEVICES_2.11R2\Firmware".

Name of the file is: PropertiesLog_<Devicename>.txt

imc Online FAMOS

See "General Changes in imc STUDIO" > "[imc Online FAMOS and imc Inline FAMOS Editor](#)"¹⁷⁸.

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Topic	Description
imc Online FAMOS	• The function <code>OtrEncoderPulsesToRpm</code> returned the value "0" if it was configured with two missing teeth. • imc Online FAMOS syntax check did not report error when using the function <code>ECUSend</code> with faulty arguments.
CAN-Assistant	When importing a CBA file, there was no messagebox as to whether the existing configuration may be overwritten.

5.20.2 General Changes in imc STUDIO



CAN-sending channels in the Bus Decoder

CAN-sending channels can now also be extracted by the Bus Decoder. Previously, only receive-messages could be processed. Now it is also possible under the tab "Validity" to make the associated settings for CAN-sending channels.



imc Online FAMOS and imc Inline FAMOS Editor



- There had been differences between the functioning of the autocomplete mechanisms in imc Inline FAMOS and in imc Online FAMOS regarding the preset. The "first suggestion" from the list is applied by means of the Tab-key. When the ENTER-key is pressed for the "first suggestion", a line break is inserted. When navigating through the list of suggestions, either TAB or ENTER can be used to apply the suggestion.
- The autocomplete mechanism now also displays pv-variables.
- The channel comment is displayed along with the properties (Help-window).
- The font size in the Editor can be altered by means of CTRL+scroll wheel.
- The function key F3 now continues the search, even if the search dialog was closed.
- When opening the text search dialog, a selected text is now suggested as search text.

The changes to the imc Online FAMOS-Editor which had been made earlier have now also been implemented in the imc Inline FAMOS-Editor:

- With code-folding of IF-conditions, the condition is now included in the display. Only the content of this control command is hidden.
- The autocomplete mechanism now provides the matching "END" for control commands; e.g. if you insert an "IF".
- Automatic indenting for control commands now also works on subsequent levels, not only on the first.
- In the drop-down menu for the control commands, commands were displayed which were mentioned in comments.



Cross-correlation in imc Inline FAMOS

A new function has been implemented: "`CrossCorrelation`". It cross correlates a test channel with a reference channel.



Options

The confirmation prompt appearing upon closing of the Options has been revised. Now, with the project options, it only asks whether changes are to be saved directly. Application options are automatically saved upon closing imc STUDIO.

5.20.3 Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
CAN-Assistant	Import of a2l-files has been accelerated significantly.
Widget > Standard	Widgets of the group " <i>Standard</i> " (text box and single-line/multi-line input) can now also resolve variables read out of a measurement by means of "@", e.g. " <i>Name@Measurement#1</i> ". Previously, after saving and re-loading an experiment, only three question marks were outputted: "???".
Commands > Import/Load Variable	The use of placeholders in filenames did not work; they were not resolved. Now, a file can also be specified by means of a placeholder, but the variables to import/load from it must additionally be specified.

5.21 imc STUDIO 5.2 R3

5.21.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.21.1.1 Firmware imc DEVICES 2.11R1

Fieldbus



Sending CAN-messages with time synchronization

With the help of Synchronous-Tasks in imc Online FAMOS, it is now also possible to send CAN-messages.

The following constraint must be observed: CAN-messages can (as previously) either be sent in the asynchronous Task, or in a synchronous task. Sending in multiple synchronous tasks is not possible.



FlexRay decoded in the Bus Decoder

The sampling intervals for the Bus Decoder are now calculated correctly according to the settings. The following parameters are used for that purpose:

Sampling interval = gMarcoPerCycle * gdMarcotick * CycleRepetition

However, the imc measurement devices can only output at the fixed sampling rates (... , 1, 2, 5, 10, 20, ...). In the device itself, an appropriate sampling rate is assigned according to this pattern. In consequence, the FlexRay-channel in the Bus Decoder can have a different sampling rate than the FlexRay channel in the device.

Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
imc Online FAMOS Editor	- With code-folding of IF-conditions, the condition is now included in the display. Only the content of this control command is hidden. - The autocomplete mechanism now provides the matching "END" for control commands; e.g. if you insert an "IF". - Automatic indenting for control commands now also works on subsequent levels, not only on the first. - The Syntax-Check had been performed only one single time. Attempts to repeat performing it without having made any change did not cause the associated error message and position indication to be shown. - In the drop-down menu for the control commands, commands were displayed which were mentioned in comments. - With the function "SetData", it was no longer possible to send variables' values. - The code folding did not work properly in some cases. When control commands appeared in comments, these were identified and evaluated by the folding mechanism and thus caused problems in the display. But not for executing the code. - The function "STri" no longer worked with variables. It was only possible to enter fixed numbers as the parameters.
imc CANSAS-SENT	Loads "SENT"-description files to imc CANSAS with "Slow Channels" for a imc CANSAS-SENT-module. Affected channels were adopted into the CAN-Assistant as "passive". They should have been active.
Triggering of imc CANSAS channels	The system failed to observe the event dwell time for imc CANSAS-Fieldbus channels. The setting "0 s" was always used.
Network data storage with saving intervals	With some devices of serial number 19xxxx, it had not been possible to save data to a network - when a fixed number of saving intervals was set AND - only one channel was saved.
imc CRONOSflex with CAN and imc Online FAMOS	Interference on the CAN-Bus had negative effects on the processing of imc Online FAMOS. The resource demands on imc Online FAMOS temporarily spiked (recognizable by higher values with the function "GetSampleCount").
Capacity of memory cards	The capacity of a memory card in the device was far overstated. The imc Online FAMOS-function "DiskFreeSpace" returned incorrect results.

5.21.2 General Changes in imc STUDIO



Importing variables to saved measurements

For the dialogs and commands "Load Variable" and "Import Variable":

It is now possible to specify the target measurement with the command. Thus it is possible to import variables as well as videos to a measurement. No measured data are saved with the measurement. They are temporarily saved in the Data Browser in the measurement folder. Thus they are available for used in the display or for further calculations.

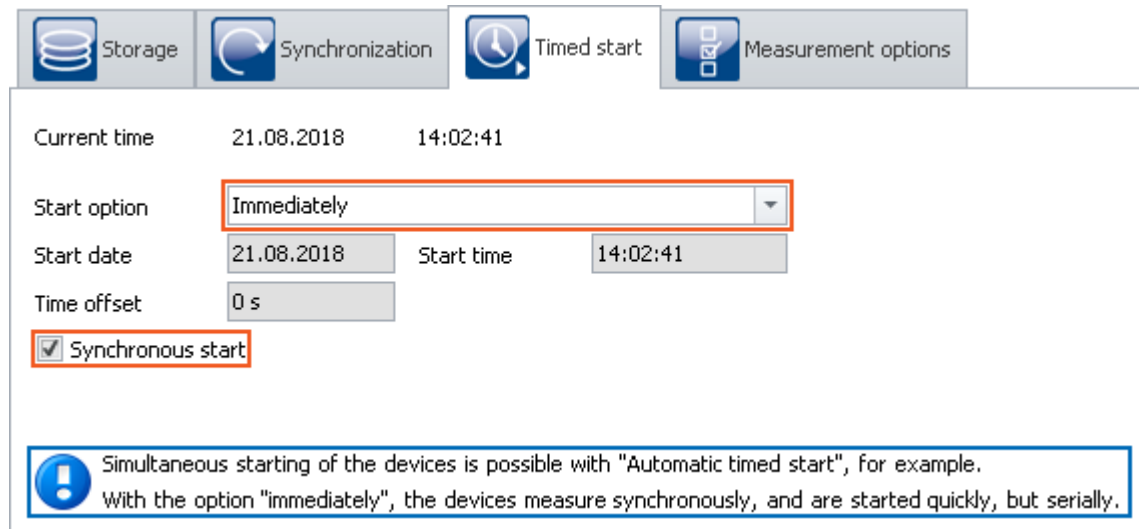


Timed start-settings: Support for synchronized starting of all devices

If the starting option is set to "*immediately*", the devices do not all start simultaneously. Now, a corresponding notification text appears in the dialog for the timed start if:

- the checkbox "*Synchronous start*" is checkmarked and
- the starting option is set to "*immediately*".

Note: Simultaneous starting of the devices is possible with "*automatic timed start*", for example. With the option "*immediately*", the devices measure synchronously, and are started quickly, but serially.



Storage Synchronization Timed start Measurement options

Current time 21.08.2018 14:02:41

Start option **Immediately**

Start date 21.08.2018 Start time 14:02:41

Time offset 0 s

☒ Synchronous start

! Simultaneous starting of the devices is possible with "Automatic timed start", for example. With the option "immediately", the devices measure synchronously, and are started quickly, but serially.



Handling time zones

In imc STUDIO, it is possible for differing time zones and clock readings to coincide.

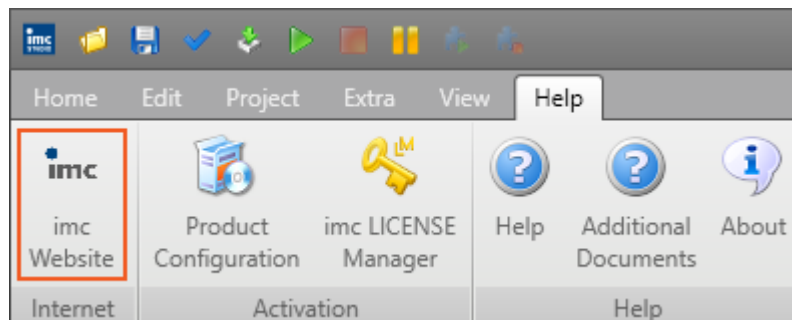
- The external clock (e.g. GPS-mouse) may indicate different time than the PC.
- The devices may be located in different countries.
- On a business trip, the laptop's clock time may reflect a different time zone than the device's.

The clock-Widget can be set for different time zones. For this purpose, there is a new selection available: "*imc STUDIO-Time zone*". With this selection, the clock automatically uses the device's time zone. With the selection: "*Local time zone*", the PC's time zone is used.



Reaching information and help texts more quickly

There is a new button "*imc Website*" in the "*Help*" menu ribbon. By means of this button, imc's web page is opened in the browser. Here, the user is provided with a quick way to contact imc , for example.



5.21.3 Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Automation	- User-defined variables: The designation for the Integer-variable type has been corrected. No adaptations to experiments are required. - When an unknown variable (typo) was used in the Automation-editor, the error was no longer reported correctly. For this reason, it was not clear that it was necessary to look for the error in the Automation-editor.
Panel	- Some commands were missing from the Panel-context menu: "<i>Page Layout for Printout</i>", "<i>Copy Page</i>", "<i>Paste</i>" and "<i>Rename</i>" - The Panel-zoom affected the font size and scale of Widgets created. It depended on whether or not the zoom was activated.
Diskstart/Autostart	For a " <i>Diskstart</i> ", the selection " <i>at defined time</i> " is no longer available as a starting option. " <i>At defined time</i> " is valid only one single time and in many cases it prevents a measurement from starting. This limitation does not apply to a " <i>Timed start</i> ".
Events	It was not possible to trigger events for testing purposes. The function "Start" had no effect.
Commands for events	When, for example, an experiment was loaded directly via a desktop shortcut, a "Browse in Workspace" command associated with the Sequencer event "After Experiment Loaded" was not executed.
Placeholders	Even when path-placeholders were used correctly, at various locations a warning was mistakenly posted which said that the path was not valid.
Powertrain Monitoring	The button "Powertrain Monitoring Panel" caused an error message to appear; the dialog did not open.
User administration	Access rights for the free-floating curve window were not saved.

5.22 imc STUDIO 5.2 R2

5.22.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

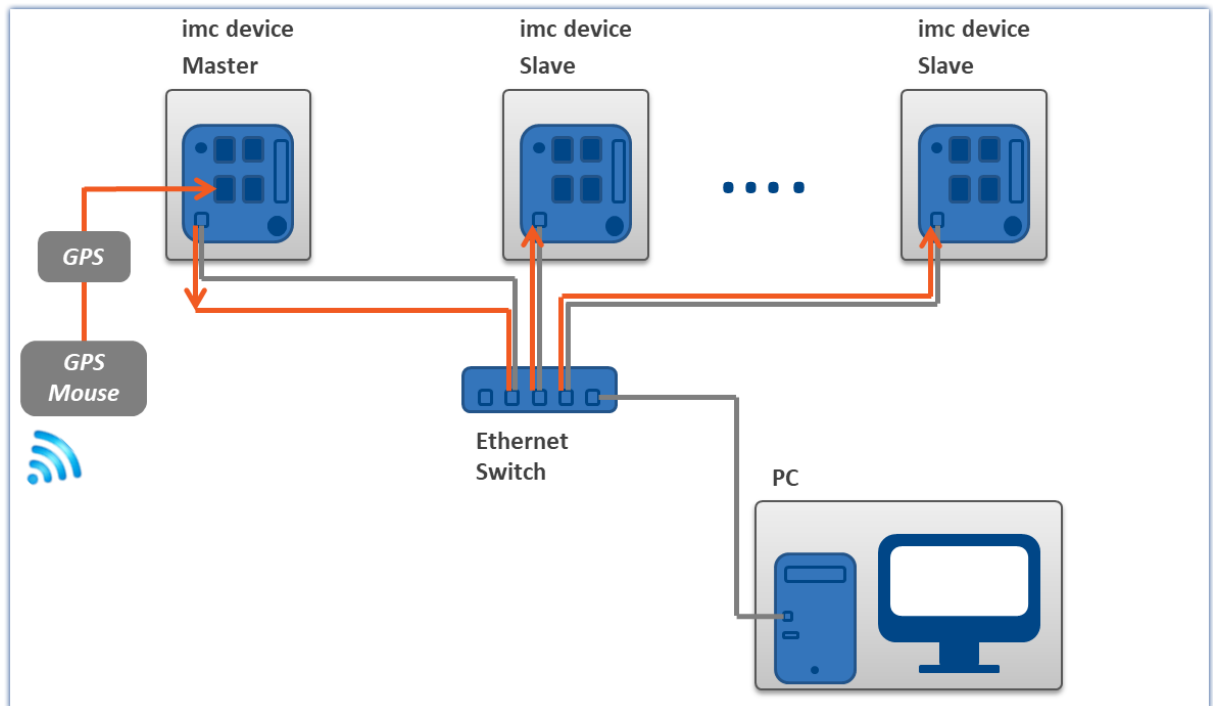
5.22.1.1 Firmware imc DEVICES 2.10R3

Synchronization



New synchronization type: PTP-Master only

If the network includes **no PTP-server true to absolute time**, you can **synchronize** one **imc device** to a hardware synchronization signal (e.g. GPS). When you define that **device as the PTP-master**, it will no longer be synchronized by any other PTP-subscriber.



A PTP-master clock synchronizes itself to the GPS-clock. All other PTP-subscribers in the network can be synchronized to this master.

PTP-Master only, and DCF or IRIG-B output

As an additional way to output the time information as the PTP-master, the device can also be defined as the DCF- or IRIG-B-Master.

RAM-Buffer



Automatic adjustment of the RAM-buffer (e.g. for high-speed channels) – Corrections no longer required

When **multiple high-sampling-rate channels** are used, the **RAM-buffer** in the device may eventually become **insufficient**. In the past this caused the following error to occur: *"Insufficient memory in device! Please observe the RAM buffer time of the channels and the number of triggers."*

Previously, *"auto"* signified a fixed value which depended on the device class. In all systems having an aggregate sampling rate of 400 kHz or more, the buffer duration was 10 s. In the new version, the **setting "auto" now dynamically adjusts the RAM buffer to between 2 seconds and 10 seconds**.

Existing experiments do not need to be modified. *"auto"* had been the default setting. Thus, the new function is used immediately unless the buffer had been set for a fixed value.

imc Online FAMOS: Events-channels



OFA_Events-channels now retain their settings upon transfer to a different device

Since the channel's default **name** always **depends on the device**, the channel is newly created upon being transferred to a different device. However, this means it also loses all of its settings. For instance, the setting which determines whether the channel is to be saved. Additionally, Widgets do not display the new channel, since they still reference the old names.

Now, **the channel keeps the name**. Even if it no longer fits the device name. But the advantage is that channel transfer is now possible without any corrections needed.

Tip: Assign an appropriate and distinct name to the channel. To do this, open the imc Online FAMOS-editor and there, open *"Properties"* (F5). Here, change the name for the OFA_Events-channel.

5.22.2 General changes in imc STUDIO (2)

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Sequencer	In some cases, the selection in the table and in the event area jumped to the top. In consequence, it was continually necessary to scroll to the desired line.
Automation	• An internal channel is saved along with the measured data, if an imc FAMOS-event is attached to a "State". This channel is now no longer saved. • Extending a "State"-element (across multiple tracks), or reducing its extent was not recognized as a change. If that was the only change to the Automation, it was not reflected upon next starting the measurement, nor saved along with the experiment. Now the change is recognized correctly. Upon starting measurement, the preparation process is accomplished correctly.
Widgets	Some Widgets were slightly shifted in location when an experiment was loaded.
Curve window	A curve window made substantial demands on software resources if a segmented channel (e.g. an FFT) with the following settings was displayed: Scroll mode: <i>"Scroll"</i> and X-axis <i>"logarithmic"</i> .
Panel	Variable names which contained the German keyword <i>"Messung"</i> were not supported. Widgets displayed yellow warning triangles.

Area	Description
Error upon moving between pages	The process of shifting from the Trigger-page or Power Quality to the Panel has been corrected. In some cases, the page was changed so that it became necessary to restart imc STUDIO.
Licenses via the License Server	When the connection to the license server (network licensing) was temporarily lost, imc STUDIO would close automatically after some time. Now, instead of that a message box appears in the foreground until the connection has been re-established.

5.23 imc STUDIO 5.2

5.23.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

5.23.1.1 Firmware imc DEVICES 2.10(R2)

Synchronization and supported firmware



The synchronization between PC-components and the devices has been improved

The PC virtual clock's (VRTC) adjustment algorithm has been revised; **in consequence the synchronization** of PC components to the device clocks is **more precise**. This applies to Video or 3rd-party devices, for example. The new VRTC only works in conjunction with appropriate firmware versions: 2.10 or higher. For this reason, it is not possible to use older firmware versions. Devices of Group 5 and higher (as of serial number 140000) support the new synchronization precision level. With older devices, there is no change.

This change does not affect synchronization between devices, but only between the PC-components and the device.

 **Note**

Older firmware versions are no longer supported

imc STUDIO 5.2 only works with firmware as of Version 2.10.

Hardware



imc SPARTAN/LVDT16

New amplifier imc SPARTAN/LVDT16 is now supported. The amplifier is specially designed for LVDT measurements (Schaevitz coils according to the transformer principle and inductive half bridges).

Data storage on device



Minimizing data volume requirements on the device hard drive by means of compression

For certain channel types, it is possible to reduce the disk space requirements (file format: "imc FAMOS ZIP"). In the background, the file size is minimized by means of zip-compression. The result depends accordingly on the nature of the signal.

Data compression of the following channel type is newly introduced:

- **digital input-ports**

In total, data compression is thus available for the following channel types:

- analog/digital fieldbus channels
- log channels of the CAN-Fieldbus
- digital input-ports

GPS



GPS channels can now be renamed. Thus, the name can be selected to match the application.

Fieldbus



CAN-Assistant

- Import and export via CBA file can now be executed individually for each node.
- It is now possible to convert a "send message" into a "receive message" or vice versa. "Edit" menu of the CAN Assistant: "*Transform messages*".



ARINC-Assistant

- Reception of BCD labels is now possible in reverse order.
- BNR and BCD can now be defined by factor and offset.

Fieldbus



FlexRay

- The FlexRay-log channel can now be decoded by imc STUDIO during the measurement. Decoding after the measurement by imc FAMOS is possible.
- UpdateBits are now supported: PduUpdateBits and SignalUpdateBits.

 **Note**

Update Notes

By adding the FrameDescriptionBlob, it is possible that previously created FlexRay configurations show an "Error in the cluster...". In this case, the value "{ResultName}_Fdb" must be entered in the FlexRayCluster properties under "Construction rule for channel names in the FrameDescriptionBlob".

Measurement setup	Name	ID	Comment
Slot 2	FlexRay-Cluster 1	FlexRayCluster01	
Frames			

Property	Value
Default properties	
Name	FlexRayCluster01
Comment	
Construction rule for channel names	{Clu}_{Fra}_{Sig}
Construction rule for names of Monitor channels	{Clu}_{Fra}_{Sig}_mon
Construction rule for BitPort channel names	{Clu}_{Sig}
Construction rule for names of BitPort Monitor channels	{Clu}_{Sig}_mon
Construction rule for ECU channel names	{Clu}_{Ecu}_{Sig}
Construction rule for names of ECU Monitor channels	{Clu}_{Ecu}_{Sig}_mon
Construction rule for channel names in the FrameDescriptionBlob	{ResultName}_Fdb
Construction rule for names of bus- and error-logging channels	{Clu}_{Sig}

TEDS



When reading in the channel settings from TEDS, the sampling rate is no longer accepted. If more than two different sampling rates were read in via TEDS, this led to aborting in the past.

5.23.2 General Changes in imc STUDIO

Improved window handling and recognition of changes to views

A new technology is now used for the software interface. In consequence, there are a few new functions and adaptations in terms of operation techniques. Additionally, some issues and problems have been resolved.

- The tool windows now have a defined width. The width doesn't change when the tool window is pinned.
- The logbook is now opened even when a dialog has the focus. E.g., in the past the logbook was not opened if saving of a Diskstart configuration failed due to an error. Now the user sees immediately where the problem is.
- Adaptations of the user interface, such as changes to the order of columns on the Setup pages, are detected automatically. When you close imc STUDIO, there is an explicit prompt asking whether to save the changes with the view.
- The buttons at some locations in the ribbon were not operable.

The list of operating systems supported has been revised

Supported operating systems
Windows 10
Windows 8.1
Windows 7 (32 Bit; recommended: 64 Bit)

This gives us better ability to accommodate the most up-to-date operating systems. It is possible to delete old components such as ones needed by Windows XP, which has the effect of streamlining the system.

5.23.3 Setup and Device Control



No more loss of data due to forgetting to save

Data storage on the PC is now activated for all channels by default. This applies to all channel types such as analog, virtual, Fieldbus channels, etc. Thus, data loss is prevented, since the option can no longer be selected by mistake. If data storage is not desired, it can of course be deactivated.

Reference

If this function is not desired, you can deactivate data storage also for newly created channels by means of "Default values".
For a detailed description, see the user's manual under: "*Setup - Device configuration*" > "*Ribbon*" > "*Configuration*" > "*Default Values*"



Single trigger release now no longer default

The amount of trigger releases is now pre-set to "unlimited". Any trigger count limit must be set deliberately instead.



Secure connection to the device via imc REMOTE SecureAccess

"imc REMOTE SecureAccess" enables direct and secure access to a device even when there is an activated firewall. There is now the possibility to add a device to the measurement by means of "imc REMOTE SecureAccess".



Note

Prerequisites

- The option "imc REMOTE SecureAccess" is available for a price and is protected by an activation code.
- Only imc devices from serial number 140000 onward are supported.
- For transfer via secure https access, a certificate obtained along with the installation purchase. This certificate has an expiration and must be renewed annually. After expiration, the system provides notification that the certificate is no longer valid. Depending on the security level set for your IT environment, you may no longer be able to establish a connection with the imc device. In this case, contact our tech support and your IT-administrator.

Saving characteristic curves from an experiment

In the tool window "Sensors" under the heading "Connected sensors", any imc STUDIO characteristic curves used are indicated. Unless the program knew these characteristic curves for other reasons, they could not be used in different experiments. You now have the option of copying the characteristic curves by means of Drag&Drop to the group headed by "User-defined characteristics". Thus, the characteristic curves are known to all experiments and can be used in them.

Security during password entry

Passwords are no longer displayed visibly. This had affected accessing of a network drive when saving data from a device.

Hiding of settings which are not applicable

For histograms, it had been possible to activate circular buffer memory. This is now no longer possible since a histogram contains no time information.

Deleting imc CANSAS from the configuration

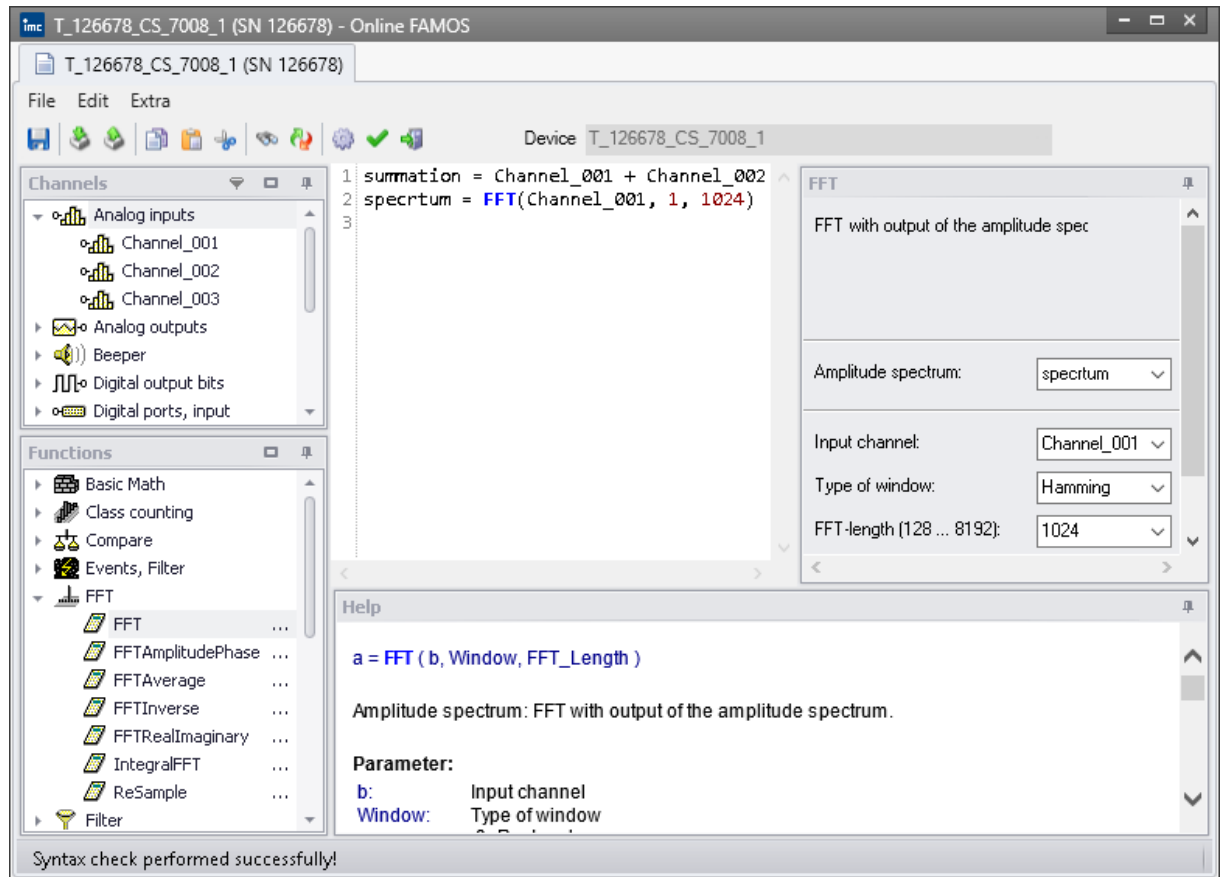
Previously, the imc CANSAS configurations could not be deleted from the CAN configuration if imc CANSAS was not installed. This is now also possible with newly created experiments. For experiments created with imc STUDIO 5.0 or older, this remains not possible.

5.23.4 imc Online FAMOS



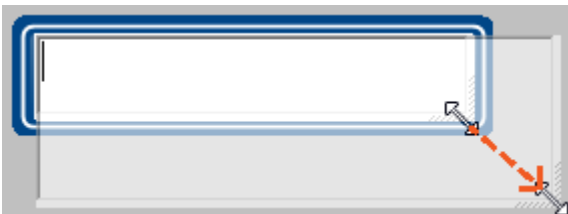
imc Online FAMOS's editor has been modernized. All functions belonging to the imc Inline FAMOS editor have been adopted into it.

In particular, the Editor's syntax support and user input via the Formula Assistant deserve mention. The Editor now comes with all familiar functions of a script editor in order to offer support in making entries. For instance, by offering suggestions while the source text is entered.



5.23.5 Panel, Widgets and Data Browser

Text-Widget - More room for the entry



The space for entering text is often not sufficient. The text-Widget has a fixed size and entry is additionally impeded by scroll bars. Now it is possible to enlarge the input box using the mouse. As soon as the entry is confirmed, the input box's size re-adapts itself to the Widget.

Exact specification of Widget: Automotive, Industrial and Designer -

"Input, Output" > "Text"

A new type of variable facilitates the embedding of system information in the report

#	Name
1	Current measurement
	Device system variables
	System_T_160046_CRFX_2000
	Connection 1: Data rate
	Device: Client count
	Device: Disk size
	Device: Free memory
	Monitor
	SystemClock
	Display variables
	Ethernet bit
	Local system information
	Computer
	Drive
	C
	Available free space
	Total free space
	Total size
	D
	Process
	Process: GDI handle consumption
	Process: handle count
	Process: physical memory consumption
	Process: private memory consumption
	Process: virtual memory consumption
	Process vector variables
	Trigger
	Trigger_48
	Event number
	State
	Trigger time
	Virtual bits

"Complex variables" enable a tree diagram structure to be established within the Data Browser. The following variables are displayed as "Complex variables": Device system variables, local system information, and triggers.

All these variables possess various types of information which are now displayed separately and which can be moved to the Panel by means of Drag&Drop.

Improved working with the zoom in conjunction with adjusting the page size

The zoom factor is now deactivated when the Panel page is adjusted to the window size. Previously, the zoom was taken into account, with very diverse results.

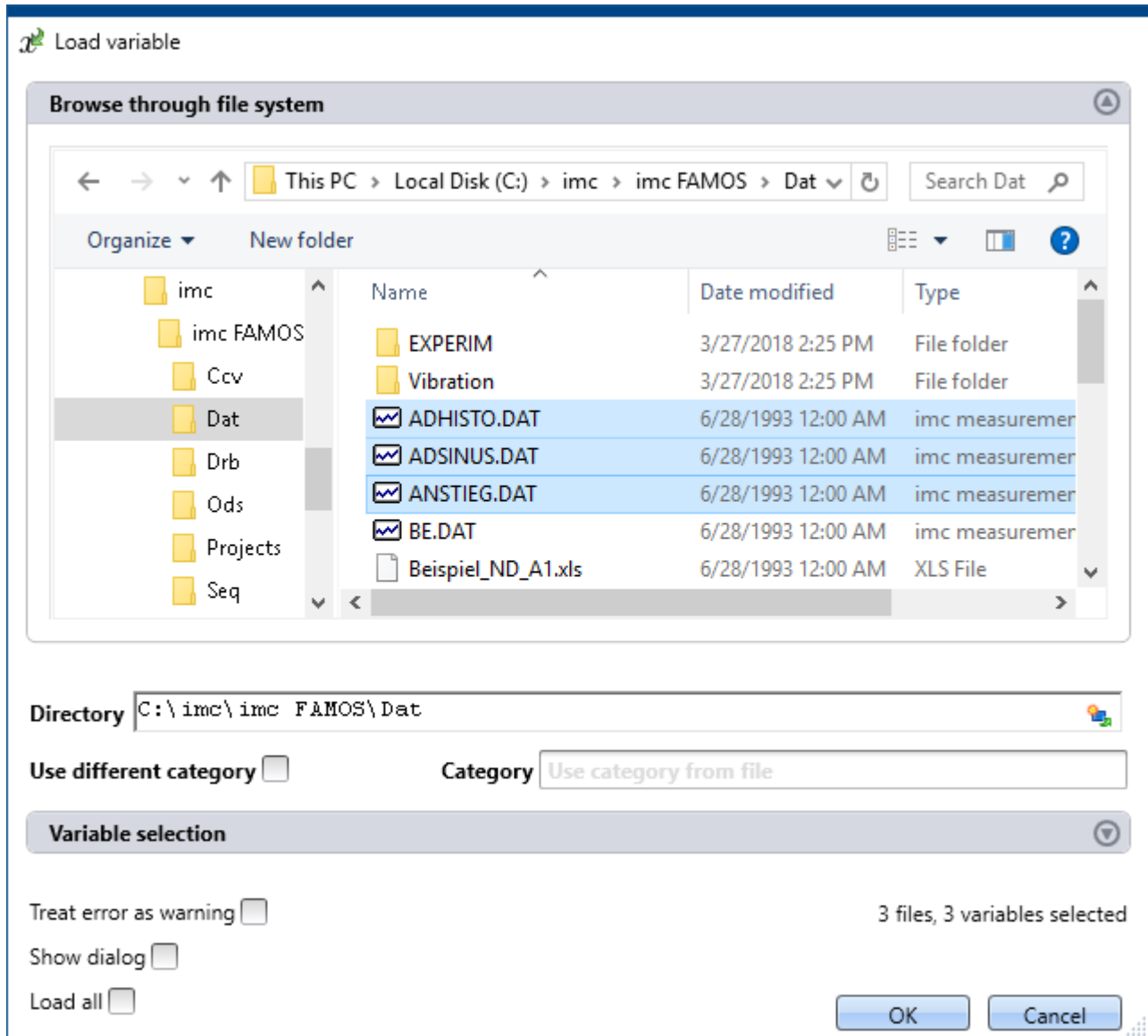
5.23.6 Commands

Easier operation of "Load variable" and "Import variable"

The functions in the Data Browser and the associated commands "Load variable" and "Import variable" have been revised. (Background info: "Load" sets up the variable and "Import" writes a new value to existing variables)

As a result of this revision, file selection is faster.

In the upper region there is an Explorer with which to select a file:



Here, you can navigate to and select files by means of the familiar "Explorer"-functions. After selection, you can close the dialog with "OK". All selected data are loaded and selected for the Import command. This simplifies the operation method and makes it faster.

If you don't select any file in the Explorer, all importable files belonging to the current folder are automatically selected.

Below the file selection window, there is an input box for the folder path, which can be used as an alternative for specifying the file(s) desired. Here, you can enter placeholders () or paths which only exist once the command is run.

Using the buttons (🔍) near the right edge, you can, for example, expand the Variables area. You can also make additional settings such as

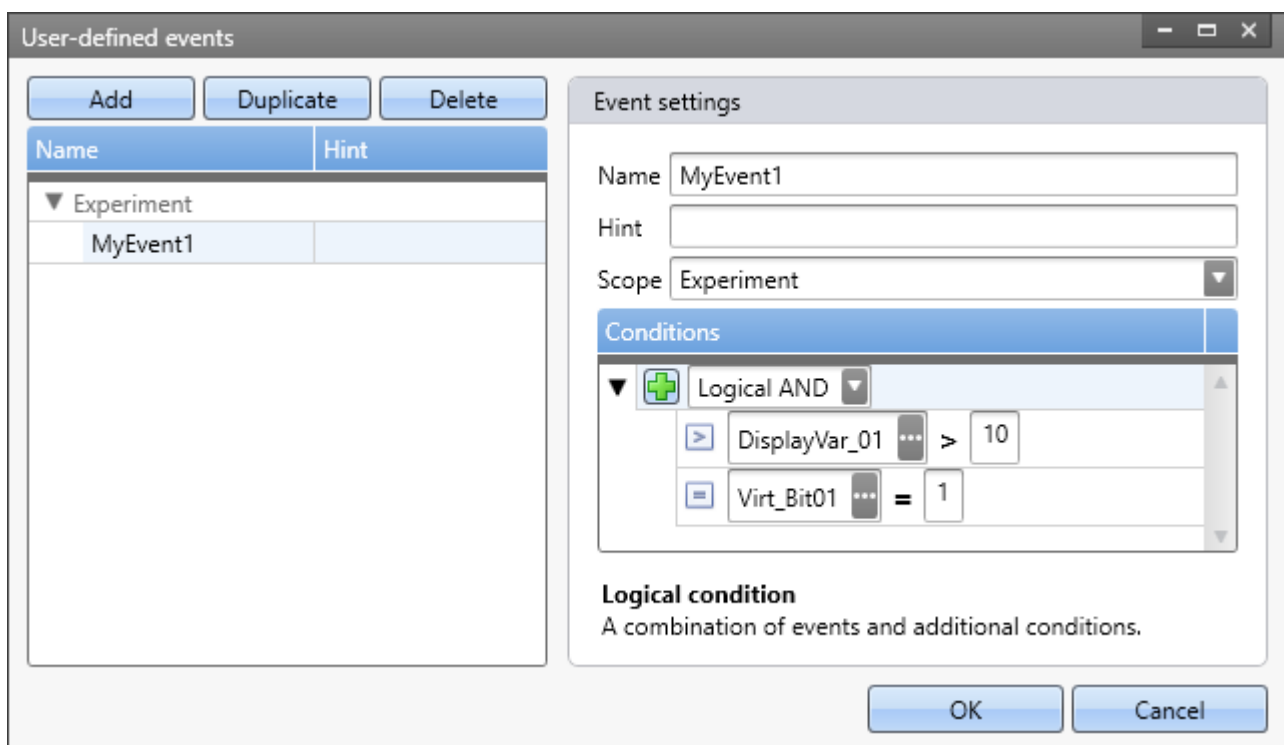
- selecting/de-selecting files or variables by means of the checkbox (☐). For such cases, for instance, where not all variables belonging to a file are to be loaded.
- adding additional elements. For the case where the variable only exists once at the command's runtime.

5.23.7 User-defined events

A better overview and more options for your application

Combining two events with each other? This is now possible. You can now apply a variety of logical operators to your events. Thus you can now easily create compound events which previously were not possible.

Using the new Editor, you have an extensive overview of your events. No matter what their scope or type. All are displayed in one dialog and can be set and edited directly.



Example: The event is triggered if the display variable is above 10 AND the virtual bit equals 1.

5.23.8 Installation

Silent product installation with pre-made configuration

To obtain uniform installation on multiple computers, the Setup program can be pre-configured. Subsequently, the installation is performed without interruption or any additional entries to make. Toward this end, the configuration is saved in prepared ini-files. The configuration is imported from these file and applied.

You can generate the ini-files automatically. For more information on this topic, see the user's manual: "Setting Up" > "Information and Tips" > "Unattended Installation - Silent Installation".

5.23.9 Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Sequencer	Logbook entries from the Sequencer were not hidden. Information entries in the logbook which were attributable to the Sequencer were not always correctly assigned the category "Information" and were not hidden for that reason.
Installation and product configuration	- The component "imc STUDIO Automation Engine" always needed to be activated first for the purpose of Runtime functions. Now it is active by default in all Editions, just like all other "Engine"-components. - Subsequent correction of the product configuration is no longer necessary. In the process of installing imc STUDIO Monitor, the product configuration was not always configured correctly. For the "Developer" Edition, the Widgets and the Sequencer were not activated. - Un-installing "imc Documents" - On some computers, the process of un-installing "imc Documents" froze and was not concluded properly.
Project management	The project management dialogs now filter out "non-matching" projects. These include, for instance, the dialogs "Save As", "Manage Project" and "Open Experiment". "Non-matching" projects can refer to the imc STUDIO projects for imc WAVE, and vice versa. Use of the same database is now possible, but not recommended.
Setup and Device control	With the strain gauge measurement range, the superfluous sign, e.g. " $\pm -770000 \mu\text{eps}$ " is now omitted. Now, the readout is correctly " $\pm 770000 \mu\text{eps}$ ".
Panel and Widgets	- Fitting the page size of tiled pages - Errors in the fitting of the page size have been resolved. There had been problems with tiled pages, which were also even magnified. - Multiple copied Widgets are now inserted with slight indenting, so that they are not all placed on top of each other. - Widget: "Table" - Text-zones - For text-zones, it had been possible to set ranges, which caused undesired effects. Text-zones now no longer have any ranges. - Widget: "DIO" - If the Widget was linked with a user-defined variable, then one CPU core was at full capacity if the variable had the value "0". - Widget: "Image" - Using the setting "Center image" caused the image to become fuzzy when copied and changed its position.
Data Browser	- If the "Measurement settings" associated with a measurement are loaded from the Data Browser, a complete experiment is loaded. When you click on "Save", there is a prompt for confirmation that you intend to overwrite the current experiment, since it represents an older state of the experiment. However, this prompt did not appear when the user saved upon exiting imc STUDIO. - The variables-functions (Export/Import/Load) via the Data Browser always needed to have their settings made from the beginning. Now, when the function is called the next time, the system automatically targets the most recent path. Other settings also remain in force so that they do not need to be reset each time.
Commands	Commands: "Import/Export parameter set", "Import/Export/Load variables" and "Import/Export Panel page" The placeholders "SETUP" and "MEASUREMENT" were previously not available.

Area	Description
Scripting	- In the Scripting, the Panel-API-functions "ShowPage" and "HidePage" did not work. - Linking the curve window with variables by means of a measurement number or a fixed name could not be reversed via script. - In the script restoration dialog, the question was no longer visible when the script names were long. - When a script was exported as a DLL, no external resources were exported along with it. (Precondition: "Local copy = true"). - When an Event-script was created with the storage scope "Project", it still had the storage scope "Experiment".
imc Inline FAMOS	The function " RSFlipFlop " did not work.
Powertrain Monitoring	In the case of very many measurements of large size, it was occasionally not possible to lead the measurements.

6 imc STUDIO 5.0

6.1 imc STUDIO 5.0R14

Firmware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

Firmware imc DEVICES 2.9R10 AddOn 2019-11-11

Information on the add-on is presented in the file "AddOn Info.txt" (DVD\Products\imc DEVICES\AddOn).

General Changes in imc STUDIO

In addition to some bug fixes, the following important improvement has been made:

Widgets

Following a special Windows-update, it was no longer possible to use various Widgets. There were a variety of appearance profiles. For example, Widgets disappeared, errors were reported when creating Widgets, titles were no longer visible.

These effects have been fixed, so that you are now able to use Widgets normally again.

The list of operating systems supported has been revised

Supported operating systems
Windows 10
Windows 8.1
Windows 7 (32 Bit; recommended: 64 Bit)

This gives us better ability to accommodate the most up-to-date operating systems. In the document "*Getting started*" you will find a list that is no longer valid. The problem with the Widgets did not occur on Windows XP.

6.2 imc STUDIO 5.0R13

6.2.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

Firmware imc DEVICES 2.9R10

In this version, certain issues have been resolved.

6.2.2 General Changes in imc STUDIO

More control over the target folder for data saving

The target folder for saving measured data has previously been very rigidly specified. The user could no longer intervene once the Start button had been pushed.

Now the **target folder** is only **determined once data** which are to be saved **arrive at the PC**. Up until this point in time, it is possible to **control the folder path**. E.g. by means of the Setup pages, which had been called via the "Metadata-Assistant" before the measurement. When columns of this Setup page are used to set the path (via `<SETUP.SQL>`), the new values are observed. (see "User-defined Measurement Storage Area").

Using the menu action: "Suspend/Resume data storage", **data storage** is interrupted/**resumed**. Upon the start of the resumed storage, the **target folder is also determined again from the beginning**.

This means you can change the target folder during the measurement.

6.2.3 Miscellaneous optimization

Alongside fault removal, the following important improvements have also been implemented:

Area	Description
Setup and Device control	- With the strain gauge measurement range, the superfluous sign, e.g. "$\pm$ -770000 μeps" is now omitted. Now, the readout is correctly "$\pm$ 770000 μeps". - When device variables were renamed, in some cases copies of them remained behind in the Data Browser. One thus had both the new and the old variable.
Panel and Widgets	Level indicator: The axis scaling was initially defined incorrectly and needed to be modified afterwards. The y-axis was stated in the channel's units and not in % of the measurement range.

6.3 imc STUDIO 5.0R12

6.3.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.3.1.1 Firmware imc DEVICES 2.9R9

Fieldbus



CAN-Assistant - Multiplex messages

With the newly configurable property (for the node properties, card validity) "***Consider defined message length***", multiplex messages can be realized. The messages with the same IDs are evaluated depending on the message length.

CAN-Assistant - The property "IBC node addressing mode" has been revised

To activate with an enabling code, please contact our tech support.

Hardware



HRENC-4

Mode Angle absolute: The zero pulse is now evaluated for each revolution.

6.3.2 General Changes in imc STUDIO

In this version, certain issues have been resolved.

6.3.3 Setup and Device Control



Data storage - More data security for interval data saving

When the interval count for (interval) data saving is limited, measured data are eventually deleted automatically. In order to prevent any unintended deletion of important measurement data, a prompt now appears upon activation or when the interval count is reduced.

6.4 imc STUDIO 5.0R11

6.4.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.4.1.1 Firmware imc DEVICES 2.9R8

In this version, certain issues have been resolved.

Below, changes are described which result from these issue resolutions are which are implemented in this version in order to resolve the issues.

Hardware

CRC/UNI-4 and CRFX/UNI-4

The UNI-4 amplifier now provides full software support for the ICP2I-BNC connector (see TD "*imc ACC/DSUBM-ICP2I-BNC*").

ActiveX - COM Interface

The command `GetModuleInfo()` has been added.

The following information can be queried from a channel object:

- Serial number of the housing (CRFX module or device)
- Serial number of the interface card (CBIF)
- Serial number of the analog card (if available)
- slot
- Connection number (e. g. IN 1... 8)

6.4.2 General Changes in imc STUDIO

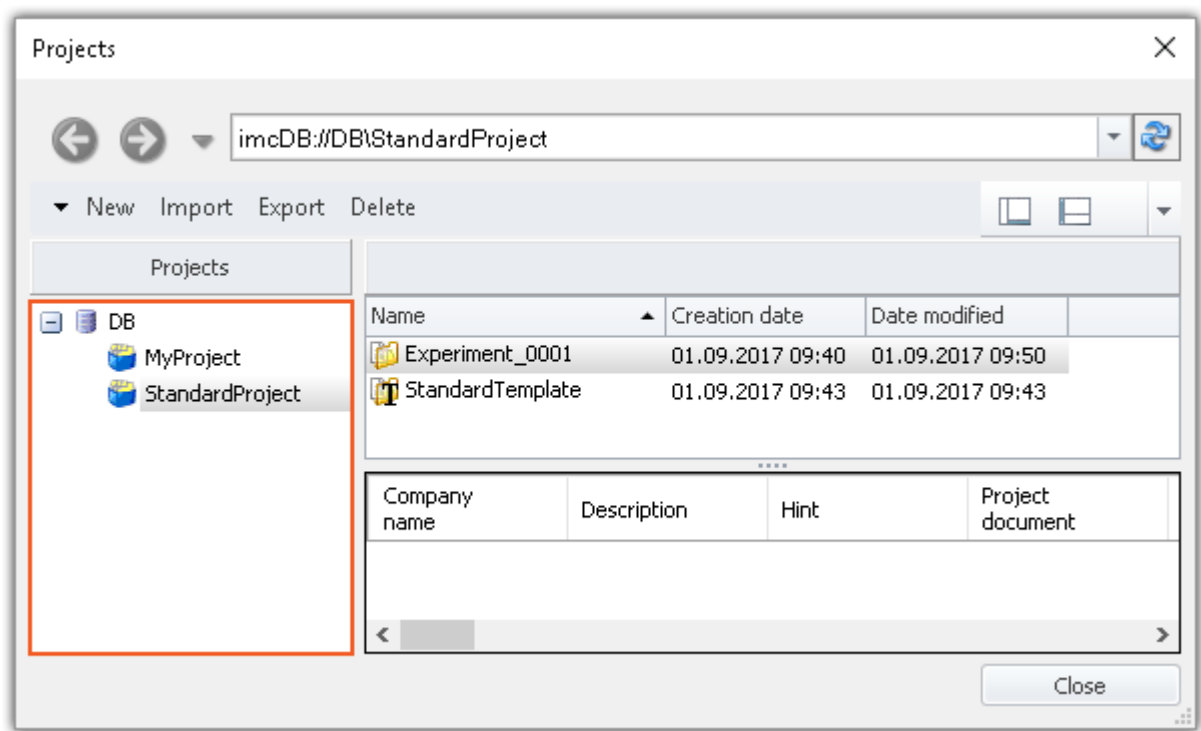
In this version of imc STUDIO, certain issues have been resolved.

Below, changes are described which result from these issue resolutions are which are implemented in this version in order to resolve the issues.

Easier method of showing projects

You can activate the "Project-View" for the project- and experiment-dialogs via the Options. E.g. "*Open experiment*" and "*Save experiment as*".

What is new is that the projects are displayed immediately if this option is activated. Previously, the Project-area in the dialogs needed to be opened ().



It is still possible to hide this area.



Menu ribbon "Help" - For quick access to the device documentation

You are able to access the following extra items via the new menu ribbon:

Menu item	Description
 Help	Opens the "Help" for imc STUDIO.
 Additional Documents	Opens the "imc Document Viewer". Here you will find documents on the imc devices and other products.
 Info	Here, all the important "version information" on your installation of imc STUDIO is presented.
 Product Configuration	Opens the Product configurator. This allows you to modify the product configuration in order to adapt it to the license you purchased. See "Changing the product configuration"
 imc LICENSE Manager	Opens the imc LICENSE Manager. The software licenses are managed by means of the imc LICENSE Manager. If appropriate, customize the licenses here.



Events in the Sequencer: For testing purposes, the ability to run individual commands is now provided

Commands can be run individually if they are linked to the events. Or, you can start running the commands from a specific command onward. This function has now also been allowed for the events, since it has established itself well for tests in the upper area in the Sequencer.

6.5 imc STUDIO 5.0R10

6.5.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.5.1.1 Firmware imc DEVICES 2.9R7

In this version, certain issues have been resolved.

Below, changes are described which result from these issue resolutions are which are implemented in this version in order to resolve the issues.

Hardware

LED 6 flashes during measurement

During a running measurement, LED 6 flashes at a 1-second rhythm. This provides a simple visual indication of whether the measurement is running. Previously, LED 6 only flashed when an imc Online FAMOS analysis was additionally running.

LED 6 does not flash,

- if it is used in the imc Online FAMOS source code,
- if flashing is deactivated in the Options,
- if imc Online FAMOS is disabled.

6.5.2 General Changes in imc STUDIO

In this version of imc STUDIO, certain issues have been resolved.

Below, changes are described which result from these issue resolutions are which are implemented in this version in order to resolve the issues.

6.5.3 Setup and Device Control



Default Values

Pre-set "Default Values" are now also applied to imc CANSAS channels.

6.6 imc STUDIO 5.0R9

6.6.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.6.1.1 Firmware imc DEVICES 2.9R6

Hardware

LED 6 no longer flashes during the measurement

In some applications, the flashing causes difficulties. Until these problems have been categorically resolved, the flashing is temporarily deactivated again.

6.6.1.2 Firmware imc DEVICES 2.9R5

Hardware

LED 6 flashes during measurement

During a running measurement, LED 6 flashes at a 1-second rhythm. This provides a simple visual indication of whether the measurement is running. Previously, LED 6 only flashed when an imc Online FAMOS analysis was additionally running.

LED 6 does not flash,

- if it is used in the imc Online FAMOS source code,
- if flashing is deactivated in the Options,
- if imc Online FAMOS is disabled.

Fieldbus



CAN-Assistant - Comments on a CAN channel also apply to the Monitor-channel

If a comment on a channel is entered in the CAN-Assistant, then it is also shown in the channel table.

Now the associated Monitor channel initially receives this comment. There, the comment can be modified. If the comment is subsequently revised again in the Assistant, the changes don't affect the monitor channel, which remains intact. Thus, changes are not applied automatically.

6.6.1.3 Firmware imc DEVICES 2.9R4

imc Online FAMOS



Charact() - Characteristic curves with XY-data sets can be used in imc Online FAMOS

Previously, only **equidistant** data sets could be used in characteristic curves. Now, the use of **XY-data sets** recorded in imc FAMOS format is possible. The X-coordinates of an XY-characteristic curve must be monotonically increasing. If they are not strictly monotonically increasing, then for one x-value there are multiple possible y-values; this means that the characteristic curve has a vertical portion at this location. If the input channel has such a value, then one of the associated y-values is arbitrarily selected as the result.

GPS



GPS Quality indicator: 9 (WAAS)

A GPS-receiver which returned a Quality indicator value of 9 (WAAS) was not previously supported. Only values up to and including 8 were evaluated. Now, values up to and including 9 (WAAS) are evaluated.

Hardware: imc BUSDAQflex

imc BUSDAQflex units delivered after May 15, 2017 come with the following new software properties:

- IRIG-B synchronization
- NTP-synchronization
- Webserver support

Fieldbus



XCPoE Master: A2L Import:

Import of A2L files created with the TCP protocol is now fully supported.



CAN Interface - High-speed transmission via imc Online FAMOS

More CAN messages may be sent at high pulse rates when using the `SendMessage_Message_*` and `Transmit*_S()` functions of imc Online FAMOS.

6.6.2 General Changes in imc STUDIO

In this version of imc STUDIO, certain issues have been resolved.

Below, changes are described which result from these issue resolutions are which are implemented in this version in order to resolve the issues.

6.6.3 Setup and Device Control



Designations of PTP-parameter as channel metadata have been revised

The channel and device configurations can be saved with the channel as metadata. In imc FAMOS, the parameters can be read from the files. The names of the PTP-parameters have been revised for imc FAMOS.

(resolved in "imc Shared Components 7.2R5")

Synthesizer dialog - Controller circuit diagram modified for better overview

The selection boxes in the Synthesizer's controller circuit diagram have partially been magnified. Thus, longer names can more easily be read and provide an better overview of the configuration.

Export of imc STUDIO characteristic curves (via the tool window "Sensors") has been improved

The following settings are now included in the export: Name, Comment and Unit.

Supplemental error message information on Fieldbus modules

Some Fieldbus module error messages now include extra information on the module affected. Previously, the message usually only read: "Call the Fieldbus Assistant". Now there is an additional notification of which device, which Fieldbus type, and which slot are affected.

6.6.4 Widgets

Extended widgets (e.g. Automotive)**Table - Insufficient space for number in the table?**

If a value cannot be displayed in full, a truncated number is now no longer displayed. The cell is instead filled with hash characters ("###") to immediately indicate the problem.

Table with the editor "Slider": Limiting entries to defined values

With the option: "Only zone values as input", it is possible to limit entries. This option can now also be used on the "Slider" Editor. Thus, the limitation is now applied to the following editors: Auto, Selection Box and Slider.

"Input, Output" > "Numeric ..." - Choosing whether or not to adapt the text background to zones

The text background can be made to depend on the zones by using the property: "Textbox color". By selecting "Zone color", the corresponding zone color is displayed as the background color. By selecting "Default color", the text background color setting is applied.

6.6.5 Data Browser

Navigation among measurements has been improved

The step length determines by how many steps the operative selection skips. Previously, when you skipped past the edge, no step length was observed. This meant, for example, that if the bottom measurement was selected and you went one step further down, the top measurement became the next operative selection, regardless of any step length. Now, the step length is taken into account.

An example of navigating through the measurements with a step length of 3:

#	Name
1	> 2017-06-14 14-48-11 (1)
	> 2017-06-14 14-48-23 (2)
	> 2017-06-14 14-48-33 (3)
	> 2017-06-14 14-48-46 (4)
	> Current measurement

Start

#	Name
	> 2017-06-14 14-48-11 (1)
	> 2017-06-14 14-48-23 (2)
	> 2017-06-14 14-48-33 (3)
1	> 2017-06-14 14-48-46 (4)
	> Current measurement

First click

#	Name
1	> 2017-06-14 14-48-11 (1)
	> 2017-06-14 14-48-23 (2)
	> 2017-06-14 14-48-33 (3)
	> 2017-06-14 14-48-46 (4)
	> Current measurement

Second click

#	Name
	> 2017-06-14 14-48-11 (1)
1	> 2017-06-14 14-48-23 (2)
	> 2017-06-14 14-48-33 (3)
	> 2017-06-14 14-48-46 (4)
	> Current measurement

Second click

Previous behavior: After the flip-over, the first measurement was always the operative selection

New behavior: Correct counting

Another example: Two measurements are selected. The step length is 2. In this way, with every step you take, the next two measurements are always compared with each other. In accordance with the new behavior, the selected measurement retain their relative positions to each other.

#	Name
1	> 2017-06-14 14-48-11 (1)
2	> 2017-06-14 14-48-23 (2)
	> 2017-06-14 14-48-33 (3)
	> 2017-06-14 14-48-46 (4)
	> Current measurement

Start

#	Name
	> 2017-06-14 14-48-11 (1)
	> 2017-06-14 14-48-23 (2)
1	> 2017-06-14 14-48-33 (3)
2	> 2017-06-14 14-48-46 (4)
	> Current measurement

First click

#	Name
2	> 2017-06-14 14-48-11 (1)
	> 2017-06-14 14-48-23 (2)
	> 2017-06-14 14-48-33 (3)
	> 2017-06-14 14-48-46 (4)
1	> Current measurement

Second click

#	Name
1	> 2017-06-14 14-48-11 (1)
	> 2017-06-14 14-48-23 (2)
2	> 2017-06-14 14-48-33 (3)
	> 2017-06-14 14-48-46 (4)
	> Current measurement

Third click

#	Name
	> 2017-06-14 14-48-11 (1)
1	> 2017-06-14 14-48-23 (2)
2	> 2017-06-14 14-48-33 (3)
	> 2017-06-14 14-48-46 (4)
	> Current measurement

Third click

Previous behavior: After the flip-over, the first measurement was always the operative selection

New behavior: Correct counting

6.6.6 Commands

imc FAMOS-sequence command - You are able to transfer placeholders

Where is the measurement "x" saved? Which test object is used?

Such information can now be directly transferred to imc FAMOS. Placeholders can be entered in the page: "To imc FAMOS". When the command is run, the placeholder is resolved and transferred to imc FAMOS.

Previously, it was only possible to transfer variables to imc FAMOS. It had not been possible to transfer placeholders. They needed to be resolved beforehand in separate variables.



Note

Handling the SETUP.SQL-placeholder

The placeholder "SETUP.SQL" does not appear in the list of variables offered. Nevertheless, it can be used. In this case, the Assistant for setting up the placeholder is missing. As a workaround, you can use other locations where the placeholder is offered. Then copy the finished text into the command here. Possible options include the Widgets "Text" (Automotive, ...); input box (Standard)

6.6.7 imc Inline FAMOS



Charact() - Characteristic curves with XY-data sets can be used in imc Inline FAMOS

Previously, only **equidistant** data sets could be used in characteristic curves. Now, the use of **XY-data sets** recorded in imc FAMOS format is possible. The X-coordinates of an XY-characteristic curve must be monotonically increasing. If they are not strictly monotonically increasing, then for one x-value there are multiple possible y-values; this means that the characteristic curve has a vertical portion at this location. If the input channel has such a value, then one of the associated y-values is arbitrarily selected as the result.

The imc Online FAMOS-function has been expanded accordingly.

6.6.8 Installation

User name for login following re-start no longer case sensitive

After a restart, the installation procedure requires the same user who started the installation. Otherwise, the installation will not resume after the login. The login name for authentication is now no longer case sensitive. Reason: In certain cases, the name had been entered into the installation program with varying spelling.

6.6.9 Product configuration

Product Configurator - Clearer overview of Widget-components (imc STUDIO and imc STUDIO Monitor)

In the "Standard" edition, the expanded Widgets (including Automotive) are no longer listed. In terms of usage, nothing has changed. They can still be used in the Runtime-edition if the Widgets exist in an experiment.

6.6.10 Guardian

The Guardian, a component which monitors the folder paths on which the various measured data are stored, has had some revision.

- Occasionally, imc STUDIO provides a notification that the connection to the Guardian has been interrupted. This happens in various situations where it is currently unable to respond to requests. Now, an entry is made in the logbook once the connection is re-established.
- The Guardian has its own logbook for inspection of its operation. The logbook contents are not relevant to the used of imc STUDIO and are only occasionally necessary if requested by our tech support. The number of entries has been minimized. E.g. limits have been set for some recurring entries. After 50 MB, a new file is created and after 10 files the oldest file is deleted.

6.6.11 Powertrain Monitoring



Corrections of texts

The English texts in the software interface have been partially revised and corrected.

6.6.12 Documentation - e-Book for Windows

The documentation now features a new appearance. The CHM-format has been replaced.

Increasingly many PCs and restrictions block the old CHM-format. For this reason, we have decided on a new format for the online help. An e-Book for Windows. The e-Book is an independent "EXE"-file. Its pages are html-pages which are displayed via a browser. This means that an up-to-date default browser is needed.

Along with reliability of display, this format provides new functions:

New function	Description
Links	Via the title bar, you can open additional documents and access the tutorials by just a few clicks.
Print view	The current page is opened in the default browser. In this way, the page can be printed out via the browser.
Feedback	If you have any questions on the description, you can write an e-mail to our tech support. This function works with the default mailprogram to generate an e-mail with a pre-arranged subject and addressee. Additional info such as the chapter-ID and chapter name are also inserted. This enables us to process your question quickly.



Note

Questions, suggestions and problem solutions

If you have any comments or questions about the new format, or if you need help in devising problem solutions, please contact our tech support.

6.7 imc STUDIO 5.0R7

6.7.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.7.1.1 Firmware imc DEVICES 2.9R3

imc Online FAMOS



Access to vectors via variables

It is possible to access the elements of a vector belonging to the function `VectorStatic` with the help of variable. Previously, only static values were possible. Thus, different values can be read according to the variable's value. This function can also be applied in a Automation task (see the example under [Automation](#)²¹⁴ on this topic).



Example

In the following example, the value is read by means of the "pointer-variable": "DisplayVar_01":

```
; Executed once at the start
OnInitAll
    Vector = VectorStatic(Trigger_48, 5)
    DisplayVar_01 = 1 ; pointer to cell of the vector
    DisplayVar_02 = 0 ; value from vector
    int ii = 0
End

; run upon start of the measurement
OnTriggerStart(Trigger_48)
    for ii = 1 till 5 step 1
        Vector[ii] = ii + 10 ; vector elements are assigned a value
    End
End

; Executed during a running measurement
OnTriggerMeasure(Trigger_48)
    DisplayVar_02 = Vector[DisplayVar_01]
    ; In this example, it is necessary to ensure
    ; that the variable "DisplayVar_01" does not
    ; extend past the element count.
End
```



Note

Notes on assignment

The first element is addressed with the value "1". The second with "2", etc.

Modifiable end of a For-loop

For-loops can use variables of the type Integer as the end value.

```
; Executed once at the start
OnInitAll
    int i = 0
    int a = 24
End

; Executed during a running measurement
OnTriggerMeasure(Trigger_48)
    for i = 0 Till a Step 1
        DisplayVar_01 = DisplayVar_01 + 1
    End
End
```

Previously, it had only been possible to assign a value to the variable upon initialization (under `OnInitAll`). Now, the value can also be modified subsequently.

Example:

```
OnTriggerMeasure (Trigger_48)
    a = 15
    for i = 0 Till a Step 1
        DisplayVar_01 = DisplayVar_01 + 1
    End
End
```

The variable type of pv-variables can be controlled by imc Online FAMOS

pv-variables can be generated at various points. In most cases, the type (Int, Float) can only be set in imc Online FAMOS when it is created. Now it is also possible in imc Online FAMOS to modify the type of pv-variables (e.g. belonging to the CAN-Assistant), which are not themselves created in imc Online FAMOS.

- int: a pure numerical value (disregarding factor and offset); with 32-bit precision
- float: a scaled numerical value (factor and offset taken into account); with 24-bit precision

Example:

```
OnInitAll
    Int pv.CAN_001
    ; pure numerical value, 32-bit resolution
    ; Factor and offset disregarded
    ; If required, add the factor and offset to
    ; the imc Online FAMOS source code.

    Float pv.CAN_002
    ; Scaled numerical value, Float-resolution
    ; Factor and offset already taken into
End
```

Fieldbus



Minimizing data volume requirements on the device hard drive by means of compression

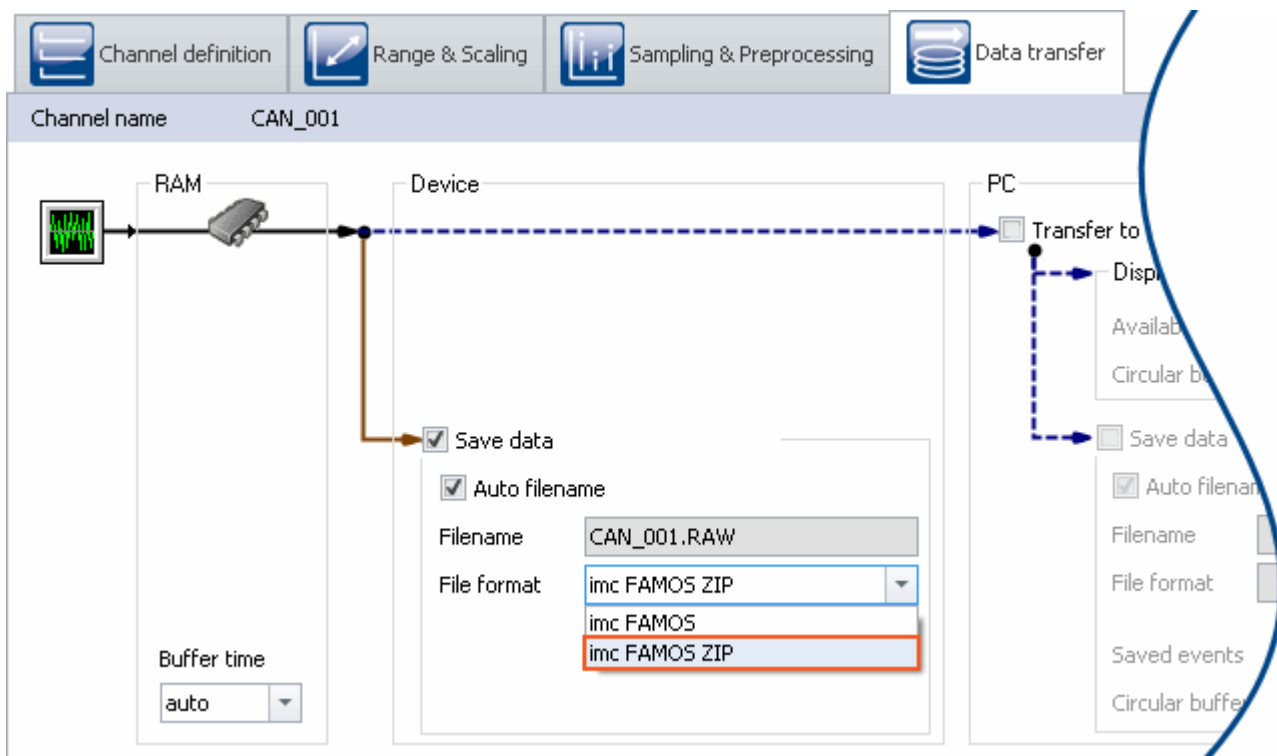
Data storage capacity consumption of Fieldbus channels on the device hard drive can be reduced by means of a new file format: imc FAMOS ZIP. In the background, the file size is minimized by means of zip-compression. The result depends accordingly on the nature of the signal.

The filename remains unchanged. As well, the handling of the file, for instance with imc FAMOS is still the same.

The file can be loaded with imc FAMOS from version 7.2R4 onward. Loading with older versions can be possible in some cases when the current imc STUDIO version is installed on the computer. Contact our tech support to find out about such cases.

Data compression is possible for the following channel types:

- analog Fieldbus channels
- digital Fieldbus channels
- Log channels of the CAN-Fieldbus



CAN-Assistant - The import mechanism for DCB-files has been revised

The behavior for the option: "Treatment of duplicate channel names" along with the selection "Don't accept in CAN-Assistant" has been modified:

Now the channel with the lowest ID, in other words, with the highest priority, is adopted.

The treatment has been revised for cases where channels have an invalid configuration and simultaneously have duplicate filenames.

CAN-Assistant - PV-variables created in imc HiL can be transmitted via CAN

If the CAN-module used can use pv-variables as a signal source, then the pv-variables created in imc HiL are now also available.

CAN-Assistant – The log-channel does not automatically fill with security-sensitive information

Previously, when a log channel is activated, the option: "Channels can be extracted from the log channel" is automatically activated. For security reasons, this has been changed. In consequence, sensitive information will not be inadvertently incorporated into the log channel's file of measured data.

Beware of the following:

Analysis and extraction via the Bus Decoder or via imc FAMOS is only possible if the box is checked. Existing experiments are not affected by this, only newly activated log channels. In this case, the option must be explicitly activated.



LIN-Assistant - When adding BitSignals to BitPorts, pay attention to the frame-association

Bits from different frames can now be joined in one BitPort. This possibility is not explicitly recommended, but is necessary in some cases. A corresponding message is posted.

LIN-Assistant - Additional variable types can be transmitted via LIN

If the LIN-module used is able to use variables as a signal source, variables of the following types are now also available:

- pv-variables
- Virtual bits
- Ether bits

RoaDyn



Support for Kistler "KiRoad Performance"

The Kistler application "RoaDyn2000" has been revised to support "KiRoad Performance".

imc HiL

MATLAB 2016b is supported.

6.7.2 General Changes in imc STUDIO

In this version of imc STUDIO, certain issues have been resolved.

Below, changes are described which result from these issue resolutions are which are implemented in this version in order to resolve the issues.

6.7.3 Widgets

New input editors for the widget "Table"



Editor	Description
Text	Entry of numbers and texts. If zones are used, no combo box is offered.
Combo Box	Entry of numbers and texts using combo box. The zones determine the selection choices.
Spin Buttons	 Entry of numbers. Editing is also possible using the arrow keys in the editor or by means of the mouse wheel, for example. In this way, it is possible to increase/decrease targeted digits of the existing number.
Button	Changes the value as long as the mouse is held pressed down
Switch	Changes the value upon each mouse click. Displays the value.
Checkbox	Changes the value upon each mouse click. Displays the check box.
Slider	For entry of values using a slider control. The range limits are determined by the cell range.

6.7.4 Setup and Device Control



Clearer presentation of channels in the Channels-table

The function "Hide Passive Channels" helps to display only the channels that are relevant. Passive channels are hidden. What is new is that the status of this setting is now saved with the experiment. This means it remains activated until the button is clicked again.

Mandatory box are now also analyzed in "Setup page as dialog"

Metadata columns can be defined as mandatory boxes. Mandatory boxes must be filled if they are present in a dialog. What is new is that they are also analyzed by means of the command: "Setup page as dialog" or the "Metadata-Assistant". This dialog can now only be closed if all mandatory boxes are filled.

Previously, this was only possible with the command: "Panel page as dialog".

Some texts have been revised

In particular, the texts for the various strain gauge modes have been revised (the names and the descriptions).

New handling for the Assistants (e.g.: imc Online FAMOS, CAN, ...)

The frames around the individual device-Assistants have been revised. Selection of devices is presented in a more clear manner and the handling message box has been improved.

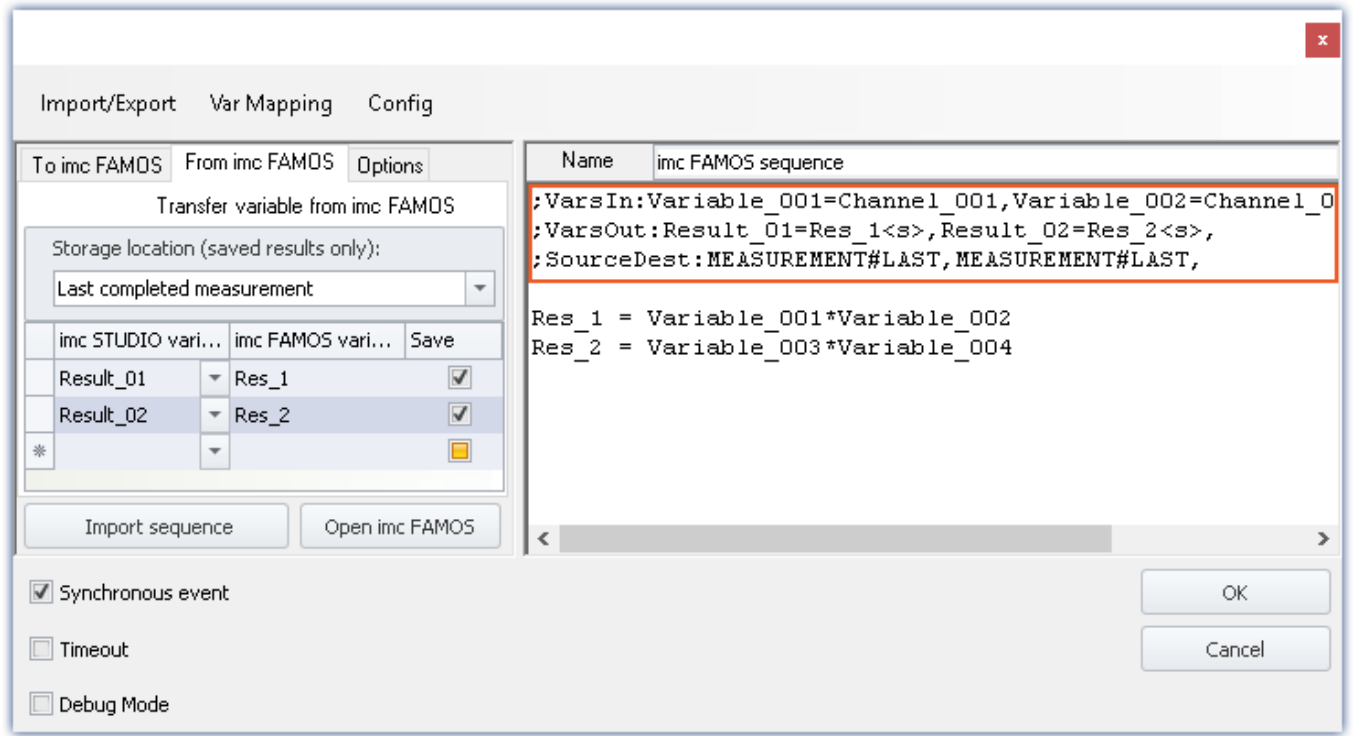
6.7.5 Commands

imc FAMOS-Sequence command - The Variable-transfer table can easily be passed to other commands

Passing (assignment) of variables can be incorporated in the sequence. Once the assignment is in a sequence, it can easily be passed (copied) to other imc FAMOS-commands.

The assignment is expected/entered as a "Header" in the first three lines of the sequence.

By means of the menu, the assignment can be passed from the transfer table into the sequence, or conversely from the sequence to the table.



Below, the header is set up (with sample names as per the picture):

Variables: To imc FAMOS:

```

;VarsIn:Variable_001
=Channel_001,Variable_002=Channel_002,Variable_003=Channel_003,Variable_004=Channel_004,

```

Description	Syntax
Start	;VarsIn:
First variable name	Name in imc FAMOS
Assignment character	=
Second variable name	Name in imc STUDIO
Separator from next assignment	,

Variables: From imc FAMOS:

```
;VarsOut:Result_01=Res_1<s>,Result_02=Res_2<s>,
```

Description	Syntax
Start	;VarsOut:
First variable name	Name in imc STUDIO
Assignment character	=
Second variable name	Name in imc FAMOS
Activation of data storage (optional)	<s>
Separator from next assignment	,

Source and data storage location:

```
;SourceDest:MEASUREMENT#LAST,MEASUREMENT#LAST,
```

Description	Syntax
Start	;SourceDest:
First name	Source of the page "To imc FAMOS"
Second name	Storage location of the page "From imc FAMOS"
Separator	,

Possible syntax:

Source or data storage location	Syntax
Last concluded measurement	MEASUREMENT#LAST
Measurement number 3	Measurement#3
Current measurement	empty, so only ", "
Fixed measurement name (as in the Data Browser)	2017-02-08 16-42-41 (1)

Examples:

Examples	Description
;SourceDest:MEASUREMENT#LAST,Measurement#1,	Source: Last concluded measurement Data storage location: Measurement number 1
;SourceDest:MEASUREMENT#LAST,2017-02-08 16-42-41 (1),	Source: Last concluded measurement Data storage location: Measurement with the name 2017-02-08 16-42-41 (1)
;SourceDest:,MEASUREMENT#LAST,	Source: Current measurement Data storage location: Last concluded measurement

Command: Setup page as dialog

See: [Mandatory boxes are now also analyzed in "Setup pages as dialog"](#)  211

6.7.6 Automation



Access to vectors via variables

It is possible to access individual elements of a vector of the type "Vector from datapool" by means of variables. Previously, only static values were possible. Thus, different values can be read according to the variable's value. This function can also be used in imc Online FAMOS.



Example

In the following example, the value is read out according to the "Pointer-Variable": "DisplayVar_01":

"Vector" is a user-defined variable of the type: "Vector from datapool".

```
; writing to a vector at a variable position
Vector[DisplayVar_01] = DisplayVar_02+10

; reading from the vector at a variable position
DisplayVar_03 = Vector[DisplayVar_01]
```



Note

Notes on assignment

The first element is addressed with the value "1". The second with "2", etc.

6.7.7 Scripting

New events added

Syntax	Description
OnCellClick	initiated by clicking on a cell
OnCellDisplayValueChangedByUser	initiated when the user changes a cell's value
OnCellDoubleClick	initiated by double-clicking on a cell
OnColumnHeaderClick	initiated by clicking on the column header
OnColoumnHeaderDoubleClick	initiated by double-clicking on the column header
OnRowIndicatorClick	initiated by clicking on the indicator
OnRowIndicatorDoubleClick	initiated by double-clicking on the indicator
OnSelectionChanged	initiated when the selection of the table (cells) has been changed

New functions for the class TableWidget added

Syntax	Description
Region: Table	
CellClick()	executes a click in the specified cell
CellDisplayValue()	returns the display value of cell specified
CellDoubleClick()	executes a double-click in the specified cell
GetCell()	returns the cell object
GetColumn()	returns the column object
SelectionClear()	deletes the current table selection

New functions for the class CellWidget added

Table cells can be set and queried. Thus, a table can be filled by means of scripting. The following example sets the text "Hello World" in the 1st column in the 1st row.

```
using System.Linq;
var cell = Panel["Page 1"]["Table1"].Columns.ElementAt(0).Cells.ElementAt(0);
cell.Text.SetText("en", "Hello World");
```

New properties for the class TableWidget added

Syntax	Description
Region: Table	
SelectedCells	returns the selected cells
RowCount	returns the count of rows
ColumnCount	returns the count of columns
Region: Columns	
Selected	returns whether the column is selected
Region: Cells	
Selected	returns whether the cell is selected

6.8 imc STUDIO 5.0R6

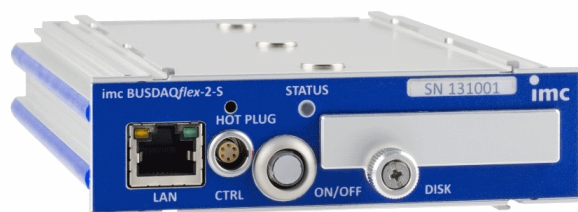
6.8.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.8.1.1 Firmware imc DEVICES 2.9R2

Device groups

The firmware supports the new devices of the class: *imc BUSDAQflex*. *imc BUSDAQflex* is a data logger series for CAN, CAN FD, LIN, ARINC, FlexRay, XCPoE, MVB and EtherCAT. The base hardware configuration of 2 CAN nodes can be expanded to up to 12 nodes for the larger device variants, for various fieldbuses and vehicle buses.



imc BUSDAQflex-2-S

imc BUSDAQflex (BUSFX) is compatible with the *imc CANSASflex* series (CANFX), CAN-Bus based measurement engineering. It offers a large choice of measurement modules which process and digitalize sensor signals and output them as CAN-messages.

All modules belonging to the *flex* series (CANFX and BUSFX) can be joined mechanically and electrically by means of a click-mechanism, without the need for any

tools or extra connection cables. In consequence, extensive by compact whole measurement systems can be constructed by direct docking of an *imc BUSDAQflex* data logger (BUSFX) onto one or more measurement modules (CANFX).

Depending on the application requirements, you can capture the measurement signals either in a distributed area (either close to the measurement site or in widely distributed measurement sites) or in a compact system (centralized; the measured data are not distributed over a large area).

Fieldbus

As of this version, many *imc* devices support the Fieldbus: CAN FD; details are provided in the spec sheet: Fieldbus expansions.



CAN FD-Bus is an expansion of the standard CAN protocol with a transfer rate which can be flexibly increased up to a maximum of 8 MBit/s. In particular in the automotive industry, it expands the range of applications, the available data transfer rates, and bus capacity.

It is software-configurable to either CAN FD Mode or conventional Standard CAN Mode and supports all relevant varieties of the CAN FD standard (ISO and non-ISO).



Note

Hardware-Upgrade

An upgrade is available for *imc CRONOScompact* (CRC) systems as well as for *imc CRONOSflex* base units shipped as of 2015 and equipped with a CAN-Bus interface!

With this upgrade, the CAN-Bus interface is replaced with the CAN FD-Bus interface.



CAN-Assistant - The import mechanism for DCB-files has been revised in order to obtain reliable results

The option: "Treatment of duplicate channel names" now offers the ability to not adopt these channels: "Don't accept in CAN-Assistant".

The option: "Channels with invalid properties" now offers the ability to not adopt these channels: "Don't accept in CAN-Assistant".

imc Online FAMOS



Writing to OFA_Event-channels in loops (FOR | WHILE) using RecortText|RecordEvent

It is now possible to output texts in loops. Thus, the function no longer needs to be outsourced but can be used directly.



Example

Example of RecordText in the For-Loop

```
; Executed once at the start
OnInitAll
  int k = 1
End

; Executed during a running measurement
OnTriggerMeasure(Trigger_48)
  If Virt_Bit01 = 1
    For k = 1 TILL 5 STEP 1 ; can also be accomplished using While
      RecordText("Hello World: " + TextFormatI( k))
    End
    Virt_Bit01 = 0
  End
End
```



Warning

If the function is called repeatedly, the output memory for texts can quickly overflow.

CRFX/ISOF-8

The amplifier: "CRFX/ISOF-8" now supports characteristic curves.

Support of sensor characteristic curves is enabled for following devices:

Amplifier	Device		
	CRPL/SL	CRC	CRFX
ICPU-8	● as of 2.7R3	---	---
DCB-8	● as of 2.7R3	---	---
LV2-8	● as of 2.7R3	---	---
UNI-8	● as of 2.7R3	---	---
ISO2-8	● as of 2.7R3	● as of 2.7R3	● as of 2.8R5
ISOF-8	---	---	● as of 2.9R2
UNI-4	● as of 2.8R7	● as of 2.7R3	● as of 2.8R5
SC2-32	● as of 2.7R3	● as of 2.7R3	---
ICPU2-8	∅	● as of 2.8R7	● as of 2.8R5
UNI2-8	∅	● as of 2.8R7	● as of 2.8R5
DCB2-8	∅	● as of 2.8R7	● as of 2.8R5
B-8	∅	● as of 2.8R7	● as of 2.8R5
LV3-8	∅	● as of 2.8R7	● as of 2.8R5
Device	Firmware		
Cx-41xx-N	● as of 2.8R7		
SPAR-N	● as of 2.8R7		

●:	Feature supported	imc STUDIO 3.0R4	included firmware 2.7R3
∅:	Feature currently not supported	imc STUDIO 4.0	included firmware 2.8R3
----	Amplifier not availas ofle for this device series	imc STUDIO 5.0R1	included firmware 2.8R5
		imc STUDIO 5.0R3	included firmware 2.8R7
		imc STUDIO 5.0R6	included firmware 2.9R2

Messaging

During the initialization process, imc devices are able to send "Magic Packets" for "WAKE On LAN". Computers configured accordingly can react to these and are launched.

LED 6 flashes during measurement

During a running measurement, LED 6 flashes at a 1-second rhythm when imc Online FAMOS is being used. This provides a simple visual indication of whether the measurement is running with the calculation.

LED 6 does not flash,

- if it is used in the source code
- if flashing is deactivated in the Options.

6.8.2 General Changes in imc STUDIO

In this version of imc STUDIO, certain issues have been resolved.

Below, changes are described which result from these issue resolutions are which are implemented in this version in order to resolve the issues.

Display of large fonts

The display of some elements in Windows 10 having a very large font (dpi) has been improved. In particular, in the project dialogs (e.g. Open Experiment) and in the component: Automation.

6.8.3 Setup and Device Control

Synchronization via PTP: Parameter "User description"

Up to the present time, the parameter "User description" has been pre-filled automatically with the device designator. Now the parameter after the device selection is empty and can be modified manually accordingly.

If the experiment was transferred to a different device, the parameter remained intact, since it was not possible to rule out that it had been modified manually. In consequence, the text displayed with the device designator no longer matched the device.

The parameter is relevant to PTP-Management programs for identification purposes, but not for the synchronization directly. For this reason, there no longer is any pre-filling of the parameter.

With older experiments having pre-filled parameters, the text remains intact, but can also be modified, as previously.

Parameter set import: Import of the measurement range

Due to imprecision from rounding, the measurement range was not adopted correctly in some cases. If the measurement range to be imported did not match the possible measurement ranges 100%, then import was not possible.

Now when there is no match, the next larger measurement range is selected which completely covers the range required. To handle rounding problems, a tolerance of 1% has been implemented. If a smaller measurement range is below the desired range by only 1%, it is selected.



Example

Possible measurement ranges	0.1 and 0.25	0.75 .. 1.25 and 0.5 .. 1.5
Measurement range in the import file	0.12	0.75 .. 1.263
Import generated	0.25	0.5 .. 1.5
	because it is the next larger range	because it is the next larger range

In case of rounding problems

Possible measurement ranges	0.1 and 0.25	0.75 .. 1.25 and 0.5 .. 1.5
Measurement range in the import file	0.10000001 to 0.101	0.75 .. 1.2500001 bis 0.75 .. 1.262
Import generated	0.1	0.75 .. 1.25
	because this deviates from a measurement range by 1% or less	because this deviates from a measurement range by 1% or less

6.8.4 Automation

Space optimization

Space optimization has been implemented. Thus, particularly regarding the width, large gaps have been reduced to the minimum possible.

Color design

The branching: "Goto" now adopts the color of the target procedure, as was already the case with the branching: "Next".

6.9 imc STUDIO 5.0R5

6.9.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.9.1.1 Firmware imc DEVICES 2.9R1

CAN-Assistant

Log-channel

- Log channels can now be created simply by selecting the status accordingly (namely: active). All of this node's CAN-messages are then logged. Activation is performed on the node's "Validity" page.
- The names of channels extracted from a log channel can now be supplied with a pre-/postfix.

imc HiL

MATLAB 2016a is supported.

imc Online FAMOS

- The FFT-functions now also allow local vectors as input parameters.
- The function GetLastError has been implemented. The function returns the last error, which allows various queries by means of filters.

Synchronization: PTP

Device from Group 7 on which have the suffix "-GP" (imc CRONOS*flex* 2000GP and imc CRONOS*compact* 400GP) support synchronization via PTP.

There are a large number of parameters by means of which you can modify the protocol for your requirements. imc STUDIO offers many presets for the parameters, which have been stipulated in conventions. Additionally, you can edit each parameter.

Preset	Description
IEEE 1588 2008	Standard defined by IEEE (default setting)
fos4X	Configuration for allowing synchronization with the fos4X devices, which can be used in imc STUDIO as Third Party devices.
Benutzerdefiniert	Enables configuration of all PTP-parameters. If "user-defined" is selected, all parameters are displayed.

Temperature characteristic curves

The temperature characteristic curves used have been converted from IPTS-68 to ITS-90.

LIN-Bus

Acquisition of messages with short InterFrame Space is now supported.

ITPcom

ITPcom now supports signal at misaligned positions.

WEB-Server

PV-variables can be changed by widgets in the Panel (bar meter or numeric input/output).

Note: In the table under "Current values", the PV-variables remain write-protected.

Connect to the device

New WLAN modules

Devices having serial numbers 19xxxx supported Dual Band WLAN-modules. When selecting the channel number in imc DEVICES Interface Configuration, channels 1 through 13 **correspond** to the 2.4GHz frequency band; channels 36 and above to the 5GHz frequency band.

6.9.2 General Changes in imc STUDIO

Importing experiments and projects to existing databases

You can import project and experiment settings without deleting the subordinate level elements belonging to these. For example, you can exchange a project with a different system, while the experiments belonging to it remain intact.

This, it is possible to modify the project on a development PC and then to import it on the test station.

Info-dialog also in fullscreen: Version information / product configuration / imc LICENSE Manager

By means of the Info-dialog, you can find out, among other things, what version of imc STUDIO you are using. For the fullscreen mode, access to the dialog has been added to make the information it presents available in any situation.

6.9.3 Setup and Device Control

Sorting the virtual channels

With the virtual channels, the channels' source is indicated in the property: "Channel Type". Thus, the virtual channels are sorted in the Channels table according to their respective sources.

Exception: For device-based virtual channels from imc Online FAMOS, no source is explicitly indicated. Here, the channel type remains "Virtual Channels".

Example:

Source	Channel type
imc Inline FAMOS	Inline FAMOS: Virtual channels
Bus Decoder	Bus Decoder: Virtual channels
PowerQuality	PowerQuality: Virtual channels
imc Online FAMOS	Virtual channels

Automatic balancing in case of Diskstart/Autostart

If the column: "Balance at device startup" is check-marked, then for the associated channel, the pre-configured balancing action is performed after the device's start. By default, the column is not displayed and first needs to be un-hidden.

6.9.4 Panel

Opening a Panel page on a monitor

Pages which are embedded on a monitor (fullscreen) can now be closed in most cases. This applies to the fullscreen accessed via the function: "Show Page on Monitor", but not to imc STUDIO's "genuine" fullscreen mode.

Previously, the system declined to close the fullscreen view if the user who is logged on did not possess the right to "Exit Fullscreen mode". In many cases, however, the user got locked out, particularly if only one monitor was available.

You can now always exit the fullscreen view on a monitor, as long as you are also able to call it. For instance when

- the Panel is not in Fullscreen mode or
- the page tabs are displayed in the Fullscreen mode.

The button is hidden when the following conditions are met:

- the user who is logged on does not have the right to exit Fullscreen mode,
- the Panel is already in Fullscreen mode,
- no tabs are displayed in Fullscreen mode.

6.9.5 Commands

Revised functions

Command	Description
Show message box	The display text can now be entered in multiple lines.
Import and export parameter set	If when importing a file is specified only with the ending ".csv" and without any language-indicator abbreviation, then the system automatically searches for valid files having an abbreviation (Filename.Language.csv). New feature: If multiple such files exist (varying languages), the file in the current language is used preferentially. If it is not available, the first one found is imported. Previously, the current language was not given preference when importing. The command generates an entry in the logbook on which file was imported.
Export Variable	A file comment can be added. In imc FAMOS, the file comment is called as shown below: <pre>path = FileName?(Channel_001) id = FileOpenDSF(path, 0) comment = FileComm?(id) FileClose(id)</pre> Supported: • Export in RAW/DAT-format, as NO Key • Export to *.aet files for the placeholder %FILECOMMENT%
Import MFB configuration	The command has been expanded to make the import of EtherCAT-Fieldbus"-configurations possible.

6.9.6 imc Inline FAMOS

New functions for imc Inline FAMOS:

The following functions can be used to suppress the undesired signal fluctuations due to filtering, which occur at the measurement's start.

- [ReplaceFirstValues0](#)
For this purpose, as many initial values are replaced with 0.0 as specified in the parameter "Count".
- [ReplaceFirstValuesN](#)
At the start of the measurement, this function does not return any results. After the first "n" values accumulated, all previous values are retroactively replaced with the n-th value.
- [SkipFirstValues](#)
For this purpose, as many values are skipped as specified in the parameter "Count".

With the following functions, the parameter "TimeConstant" for imc Inline FAMOS has been expanded

- [ABCRating](#)
- [ExpoRMS](#) and
- [SoundPressureLevel](#)

The following entry options for the time constant have been added:

- 1: Fast (0.125s)
- 2: Slow (1s)
- 3: Pulse
- 4: Peak
- 5: RMS in interval
- 6: RMS from start

You can exclude Tasks from the display so that the user is not able to view them.

Any Tasks which were created using Scripting can be denoted as "private". These Tasks will then not be displayed in the Editor.

6.9.7 Automation

imc FAMOS Automation (Data cutting) - Saving results

The results of "imc FAMOS Automation (Data cutting)" can not be saved with a measurement via the imc FAMOS-dialog. Previously, the data storage options were displayed in the imc FAMOS-dialog. But since they had no function, they are now hidden.

No adaptation to the existing experiments is necessary. Once a measurement is concluded, the results can be saved with the "last completed measurement", or you can save them directly via imc FAMOS.

6.9.8 Video

GoPro video camera

The camera GoPro Hero 4 is supported. It is connected via the WLAN.

The resolution and framerate specified in imc STUDIO for the GoPro camera pertains to the preview video stream. Only this is transmitted via WLAN. The preview serves the purpose of interactive control on the PC during measurement and is not saved there.

Video data which are relevant to measurement and data storage are saved on a removable memory card (micro-SD) inside of the GoPro. In the imc STUDIO database, only an info file ending with "ivi" is saved initially. Here, information such as the triggering time, the offset, filename (on the GoPro) ... is saved. After the recording, you can copy the video files from the memory card to the database. imc STUDIO automatically recognizes and displays them.



Note

Only one GoPro camera at a time can be used in an experiment.

In order to operate the camera, a special driver package is required. This driver package can be obtained from our tech support.

The video recordings are not synchronized to the measurement readings. However, video data can be retroactively synchronized with the help of imc FAMOS, for example.

No pretriggering is possible for video recording with the GoPro.

Recordings are not automatically saved to the imc STUDIO database.

The preview of GoPro is delayed by how much depends on the network. At some resolutions, no preview is possible (see GoPro user's manual).

6.9.9 Update Notes

Revision of the Setup pages for the PTP synchronization

- To configure the new implemented PTP synchronization the "Devices" page was revised.
- This requires a database conversion if you used a previous version. The conversion will start automatically when you start the new installed imc STUDIO.
- Your existing views will be stored unchanged. Existing views of the standard names "Complete", "Compact", etc. are stored under new names, according to the schema "Complete_x", etc. The new views are automatically inserted under the standard name "Complete", etc. Both versions now exist parallel in your list.



Note

The new views correspond with the default setting views

The menu bar and all Setup pages, the window layouts, and the displayed columns in the tool windows will be reset.

Self-created **columns such as meta-columns** will not be displayed any longer. **The configuration of the columns still exists.** You can reinsert these columns to the desired position (via column selection).

You can also continue to use your self-created views.

Using self-created views

If you want to configure the PTP synchronization, you just need to change the Device page.

- Change to the desired view.
- Delete the existing device page (context menu: *Delete Page*)
- Implement the new device page (context menu: *Insert Complete Layout* > *Devices*)
- Be sure to **save** the new view again. Otherwise, the changes will be discarded.

6.10 imc STUDIO 5.0R3 build March 7, 2016

6.10.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.10.1.1 Firmware imc DEVICES 2.8R7 SP3 dated April 22, 2016

CRFX/ISO2-8

Optional support of thermocouple type-C (2320C°/24bit).

6.10.1.2 Firmware imc DEVICES 2.8R7 SP2 dated March 9, 2016

Fieldbus - Flexray

XCP over Flexray:

- Flexray now supports XCP
- Import of A2L-files for Flexray

Flexray-Assistant:

Improved import of FIBEX-files

- Prompting for signals to be imported
- Upon import of FIBEX-files, the frame name and frame comment of the signals are now displayed.
- Changes to FIBEX-files can now be applied by re-importing the file.
 - New FIBEX-signals can be selected.
 - Signals no longer present in the FIBEX are deleted.
 - The settings for the sampling interval, the curve window settings, active/passive-status remain intact for the signal which existed already before the re-import in the Assistant, as well as in the file to be newly imported.

New Signal List view

- A bus's signals are displayed in the list.
- With the help of filters for each column, it is possible to quickly find the desired signal.
 - Function: Text search throughout all columns of the view, e.g. in order to search by channel name
 - The font can be set for the user interface.
- It is now possible to invert the selection of a cluster's frames and signals.
- There is now an indication of which ECU is transmitting the frame or the signal. It is possible to filter the signal table view according to the transmitting ECU.
- It is now possible to activate Monitor channels for Flexray signals.
- The FRAME type now appears in the properties list..
- The name of the imported FIBEX-file (*.xml) is displayed in the Flexray assistant.

imc CANSAS

- When integrating multiple modules with imc CANSAS in imc STUDIO, modules with serial numbers up to 15.999.999 may be found now.
- It is now possible to take into account the sensor's delayed response upon reception of CAN-messages. In this way, it is now possible to compensate for differences in transit times.

imc Online FAMOS

- SyncTask:
The following function can now be used in the SyncTask: Monoflop(), MonoflopRT(), JKFlipFlop() and RSFlipFlop().
- Balancing/Shunt calibration:
Balancing/Shunt calibration can now be executed out of imc Online FAMOS by functions RunAutoBalance() and RunAutoShuntCalibration().

6.10.2 General Changes in imc STUDIO

Localization

Display and notification texts have been partially revised.

6.10.3 Panel

"Zoom" and "Adapt Page Size"

Both functions can now be used on all pages loaded simultaneously. Thus for example, all Panel pages can simultaneously be adjusted to a new window width (for instance, when changing the monitor resolution or when activating the fullscreen)

Renaming a Panel page

The right to rename a page is now conditional on possessing the "Edit Page" page access privilege. Previously, anyone could rename a Panel page.

Panel fullscreen mode

- The title bar in fullscreen mode has been redesigned.
- By means of a switch-widget, the title bar can be shown/hidden.
- The title bar has been enhanced with the following scope of functionality:
 - Activate/Deactivate Design Mode: In this way, it is possible to magnify or shrink the Panel page in the fullscreen mode, among other things.
 - Log out (logging off a user): Previously, it had only been possible to "log on". Now it is possible for users to log off without any other user needing to log on immediately.
 - The Data Browser can be opened in a "free-floating" window from the title bar. Thus it is now possible also in fullscreen mode to navigate between the individual measurements, for example. The display of the Data Browser in the fullscreen mode can also be prohibited through the use of access privileges.
- The program can be minimized in fullscreen mode.

6.10.4 Setup and Device Control

Column: Module SN

The column "Module SN" now only returns the serial number of the housing for CRFX-modules.

6.10.5 Commands

Revised functions

Command	Description
Show message box	In the display text, it is possible to force a line break by means of "\r\n".
Import and export parameter set	If when importing a file is specified only with the ending ".csv" and without any language-indicator abbreviation, then the system automatically searches for valid files having an abbreviation (Filename.Language.csv). If there is any corresponding file, it will be imported. The command generates an entry in the logbook on which file was imported.

6.10.6 Scripting

Operations modified

The internal interfaces are hidden in the code completion (IntelliSense) of the script editor by default. To show these interfaces the "advanced code completion" must be activated in the imc STUDIO options.

New functions

- Panel pages can be deleted in a script.
- A Panel page can be renamed in a script.

6.11 imc STUDIO 5.0R3 build December 15, 2015

6.11.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.11.1.1 Firmware imc DEVICES 2.8R7 SP1 dated December 14, 2015

Fieldbus - Flexray

Import and export of Flexray configuration are now possible by COM-Interface.

imc HiL

imc HiL supports Matlab R2015b.

Balancing and 2-point-scaling

Taring and bridge balancing during a running measurement is not possible if the channel had already been scaled by means of 2-point scaling.

6.11.2 Widgets

Widgets: Automotive, Industrial, Designer

Displaying variables' individual bits

Selected Widgets now offer the option of only displaying individual bits in a variable. Example: A fieldbus channel returns multiple channel states with:

- 0th bit: Sensor connected
- 1st bit: Value exceeded
- 2nd bit: Error
- ...

With the new property: "Bitmask", it is now possible to select which bit to display. If the 1st bit is selected, the Widget only shows the value of the 1st bit. Thus, with status indicators on the Panel page, it is easy to present an overview of the status of the various channels.

6.11.3 Data Browser

Automatic re-loading of measurements

imc STUDIO automatically detects when a .dat or .raw file is copied to a measurement folder. If the measurement is already loaded, a "re-load" operation is automatically initiated. Thus, the file also appears in the Data Browser.

6.11.4 Scripting

Operations modified

- There is now more information in the logbook regarding the sender when a script run malfunctions.
- When a faulty script is run, the script name and any compiler message are included in the logbook entry.

6.11.5 Update Notes

Revisions of the menu ribbon regarding user guidance:

- The names of some buttons have been elaborated (e.g.: *Project > Manage* -> *Project > Manage Projects* or *View > Reset* -> *View > Reset Workspace Layout*)
- New groups have been added (e.g.: *Project > Im-/Export* and *Project > Measurement Data*)
- Buttons have been moved (e.g. *User-defined buttons* has been moved from *Extra* to *View*)
- Buttons have been duplicated (e.g. *Panel Fullscreen Mode* is now also found under *Panel-Design* or all fieldbus assistants and the *Displayeditor* are now also found under *Home* if the device has the modules)

The structure of the menu ribbon is saved with the view. This means:

- Upon first installation, the changes are applied automatically when there is no database available.
- When updating or when using an existing database, the changes are not applied automatically.

Automatic adoption of the new view

To apply the changes, you need to reset the views to the factory settings.

Ribbon	View
Extra > Restore ()	Compact, Standard
View > Restore ()	Complete



Warning

Everything will be reset

This means not only the menu ribbon will be reset but also all Setup pages, the window arrangements and the columns displayed in the tool windows (e.g. in the Data Browser).

User-created columns, such as metadata columns, are no longer displayed. The configuration of these columns remains intact. You can insert these columns back at the desired position (by means of the column selection).

Manual adoption of the new view

If you do not wish to reset this view, you can adjust the changes manually.

Ribbon	View
View > Customize Ribbon Menu ()	Complete



Note

The changes to the menu ribbon do not include any new functions, but are only for the purpose of improved user guidance. The manual adoption by modifying the menu ribbon is not necessary.

6.12 imc STUDIO 5.0R3

6.12.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.12.1.1 Firmware imc DEVICES 2.8R7 dated August 26, 2015

6.12.1.1.1 Hardware

CRFX/AUDIO2-4-MIC

Support of the new CRFX/AUDIO2-4-MIC with a supply module for microphones.

CRFX/FRQ2-4

Support of the new CRFX/FRQ2-4.

CRFX/ISOF-8

Updated low pass filter:

Firmware up to 2.8R5	Firmware as of 2.8R7
50 Hz to 20 kHz	10 Hz to 20 kHz

CRFX/ICPU2-8

Passive channels configured as "*AC with current feed*" no longer output a current.

CRPL/CRC/HRENC-4

- The HRENC-4 signal delay has been reduced down to 1 ms.
- CRONOScompact/HRENC-4
Firmware implemented with accelerated data throughput for PV-variables.

ISO2-8

- **PT1000**: Support of PT1000 has been implemented for **special hardware** versions of the ISO2-8.
- **CRPL/ISO2-8**
With CRONOS-PL ISO2-8, a **+/-12V bipolar sensor supply** by means of a characteristic curve file is now possible.

SYNTH-8

- The controllers can be renamed.
- In Frequency Generator mode, Synthesizers only display outputs which can be supported. If the Synthesizer is not able to support the Frequency Generator mode, then this mode will not be displayed.
- Error messages now also contain the name of the device and the slot number.

Sensor characteristic curves

Support of sensor characteristic curves is enabled for following devices:

Amplifier	Device		
	CRPL/SL	CRC	CRFX
ICPU-8	● as of 2.7R3	---	---
DCB-8	● as of 2.7R3	---	---
LV2-8	● as of 2.7R3	---	---
UNI-8	● as of 2.7R3	---	---
ISO2-8	● as of 2.7R3	● as of 2.7R3	● as of 2.8R5
UNI-4	● as of 2.8R7	● as of 2.7R3	● as of 2.8R5
SC2-32	● as of 2.7R3	● as of 2.7R3	---
ICPU2-8	∅	● as of 2.8R7	● as of 2.8R5
UNI2-8	∅	● as of 2.8R7	● as of 2.8R5
DCB2-8	∅	● as of 2.8R7	● as of 2.8R5
B-8	∅	● as of 2.8R7	● as of 2.8R5
LV3-8	∅	● as of 2.8R7	● as of 2.8R5

Device	Firmware
Cx-41xx-N	● as of 2.8R7
SPAR-N	● as of 2.8R7

●: Feature supported	imc STUDIO 3.0R4	included firmware 2.7R3
∅: Feature currently not supported	imc STUDIO 4.0	included firmware 2.8R3
---: Amplifier not available for this device series	imc STUDIO 5.0R1	included firmware 2.8R5
	imc STUDIO 5.0R3	included firmware 2.8R7

UPS

The device performs a check the UPS and reports any defects upon connection.

6.12.1.1.2 Fieldbus

CAN-Bus

- **CAN, OBD-2:**
 - When the functional identifier 18db33f1h is set up as "ID for tester", all replies with identifiers from 18daf100 up to 18daf1fd are used. (ISO 15765-4 6.3.2.3).
 - Replies to the broadcast identifier 7DFh were not used when only a OBD-2 ECU was configured for the CAN node. The replies are used now.
- For nodes with format **Extended** on the Validity tab a new option had been added: IBC node addressing mode. If selected, the Channel bit, the Source bit, the Lifesign bits and the Telegram CRC bits are ignored (masked) when receiving and evaluating messages.
- **ECU:** As an additional file format for ECU *seed/key algorithms .skb files* may be used now.

LIN-Bus

Duration of *MasterBreak* in Bit-times: from 13 to 15; and bit-times of 1 to 3 for the MasterBreakDelimiter is now adjustable.

SPI

Support of SPI fieldbus modules had been implemented.

6.12.1.1.3 imc WebServer

WebServer-configurations can now be exported and imported with the WebDesigner.

6.12.1.1.4 imc Application module

The following baud rates can be used with the serial interface variant (APPMOD-COM interface):

1200, 2400, 4800, 9600, 14400, 19200 and 28800.

6.12.1.1.5 imc HiL

imc HiL supports Matlab R2014a, Matlab R2014b and Matlab R2015a.

- imc HiL Simulink blocks (imcXPCLib*) are converted to the slx-format upon configuration in MATLAB. Resetting a model's status (reconfiguration in imc STUDIO) is performed by means of the UserModel/Enable-block. This block must be set to the parameter value "reset states when enabled".

6.12.2 General Changes in imc STUDIO

Menu actions

In alternative to the menu action "Panel Fullscreen Mode", there is now a menu action "Panel Embedded View" for the purpose of exiting the fullscreen.

Options

- To provide a better overview, the imc STUDIO Options window now shows whether the respective option is saved with the project or the application.
- The option: "Synchronize always" (Setup > Virtual device clock) has been eliminated. The virtual device clock could previously be activated when synchronization between the PC and the device was required. Now, the data pool always synchronizes with the device, consequently the option "Synchronize always" is no longer needed.
- General options > Default dialog response: Additional dialogs have been added for which responses can be specified.

Placeholder

- Using the placeholder "**PROPS**", it is now also possible to call user-defined properties.
- The placeholder "**EXPERIMENT.PATH**" normally returns the experiment's "root path" in imc STUDIO. This is where, for example, config, Meta and all measurement folders are located. By contrast, if the component "Project Management" is not activated (as is the case in imc STUDIO Monitor), then the placeholder had previously not returned any result. Now the path of the configuration file .imcStudio/.imcExp is returned when "Project Management" is deactivated.
- **SQL**-Placeholder: Column identifier with spaces in the name can now be resolved. However, for that purpose an alteration of the syntax was necessary. More information on this topic is available in the chapter: *Update Notes* > [SQL Placeholder](#)^[248].
- When specifying the format of the placeholders **CONTROLS**, **VAR**, **VARs**, it is possible to specify decimal separators.
e.g. <**VARs**["DisplayVar_01"].**VALUE**("0,000")> returns: 123,456
e.g. <**VARs**["DisplayVar_01"].**VALUE**("0.000")> returns: 123.456

Menu ribbon

The menu ribbon can now be customized with large icons. In the customizing procedure, the size of the icons can be selected.

Parametersatz export and import

XML is now available as a format.

Installation/Product Configurator

Following an imc STUDIO update, as many settings from the previous product configuration as possible are applied.

6.12.3 Setup and Device Control

Parallel use of multiple firmware versions

Manual selection of the desired firmware has been implemented. After selecting a device, e.g. for a new experiment, a selection list appears. Here, you can select with which firmware version to set the experiment up, if multiple versions are installed.

Experiments which have been created with a newer device firmware version can be loaded

When an experiment which had been created with a newer device firmware version was loaded, the corresponding device was de-selected. This is now no longer the case. All settings possible are retained and a warning message is posted accordingly.

Bridge balancing and taring

It is now possible to perform bridge balancing or taring during a running measurement. It is no longer necessary to stop a measurement for that purpose.

New column: Enumerated channel number

The column: "Connector" does not correspond to the consecutive numbering on the front panel for some devices (e.g. imc SPARTAN and imc CRC). An additional optional column is available, which matches this numbering: "Enumerated channel number".

Name	Connector	Enumerated channel number
▼ Channel type: Analog inputs (Count=24)		
Channel_001	[01] IN01	IN001
Channel_002	[01] IN02	IN002
Channel_003	[01] IN03	IN003
Channel_004	[01] IN04	IN004
Channel_005	[01] IN05	IN005
Channel_006	[01] IN06	IN006
Channel_007	[01] IN07	IN007
Channel_008	[01] IN08	IN008
Channel_009	[02] IN01	IN009
Channel_010	[02] IN02	IN010
Channel_011	[02] IN03	IN011
Channel_012	[02] IN04	IN012
Channel_013	[02] IN05	IN013
Channel_014	[02] IN06	IN014
Channel_015	[02] IN07	IN015
Channel_016	[02] IN08	IN016
Channel_017	[03] IN01	IN017
Channel_018	[03] IN02	IN018

Metadata

Meta-information can be assigned to saved channels. Previously, this function was only available for the channels on the PC hard drive. Now, the information is also saved in the channels on the device hard drive.

Trigger

The pretrigger is defined for channels which are assigned to a defined trigger. Channels without such a trigger assignment, in other words, which are started directly when the measurement is started, are assigned to the symbolic special trigger "Trigger_48". If one deleted a trigger assignment for a channel, which is the same as assigning the channel to "Trigger_48", it had been necessary to also manually delete an old pretrigger-setting under "Trigger_48". This is now no longer necessary; the pretrigger is deleted automatically.

imc Online FAMOS

- If code without control commands exists in the imc Online FAMOS Editor, and if the option "*imc Online FAMOS with Control Commands*" is activated, then the existing code is automatically analyzed and expanded. To correspond with the trigger-assignments of the channels used, the individual lines of code are automatically assigned to the appropriate segments (structures).
- Further, when pasting existing codes from the clipboard into the empty editor, the system automatically recognizes whether it contains control commands. If so, the option "*imc Online FAMOS with Control Commands*" is automatically activated if necessary.
- To prevent signal jumps on a DAC output channel, during the download phase the system checks whether a DAC output channel is initialized in the "OnInitAll" block within the OFA-code. If so, this value is used and any previously set value from the datapool (e.g. via a Widget) is ignored.

Channel Name Assistant

For the purpose of changing multiple channel names, the "Channel Name Assistant" is provided. It has been completely revised and redesigned.

Channel Name Wizard

Preview

Point_of_measurement_A_01
Point_of_measurement_A_02
Point_of_measurement_A_03

Static text

Static text Point_of_measurement_

Alphabetic

Initial value: A Max Value: C Step size: 1 Overflow Rotate

Static text

Static text _

Numeric

Initial value: 1 Max Value: 3 Step size: 1 Overflow Rotate Number of digits: 2

Format item options

Delete all

Edit lists

Static text

Add Static text item

Format options

Edit formats

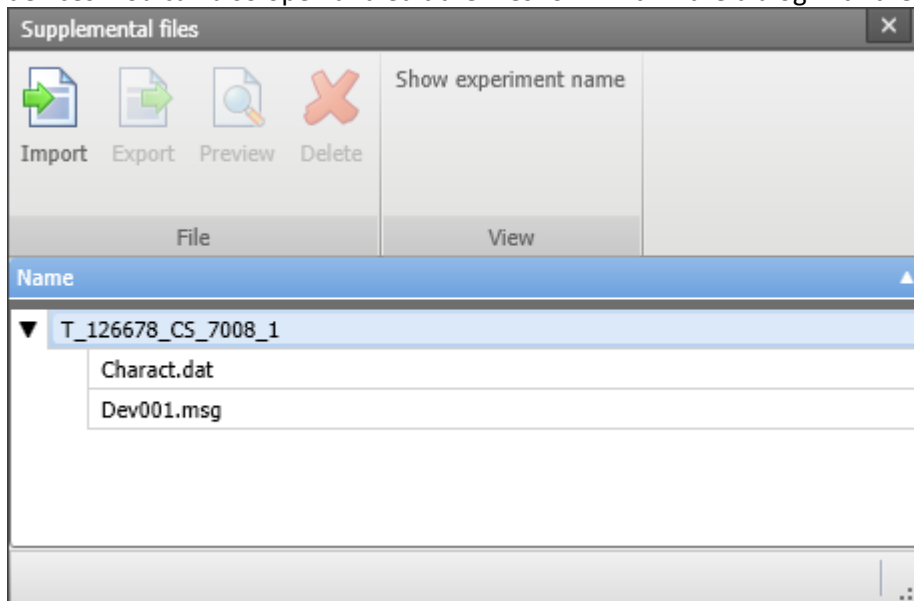
Last used Saved Format2 | Point_of_measurement_A_01, Point_of_measurement_A_02, Point_of_meas

Ok

Cancel

Supplemental files

- The new "Supplemental files"-dialog makes it possible to manage all imported supplemental files across various devices. In consequence, it is possible to quickly recognize which files are assigned to which devices. You can also open and edit the files form within the dialog with the associated standard program.



- In order to make it easy to use supplemental files from multiple devices, it is now possible to select multiple devices upon importing. In this way, all devices selected receive the same supplemental file.

Default Values

Pre-set "Default Values" are now also applied to virtual and fieldbus channels. Previously, they were used just once when a device was selected.

Charge - Reset

Connector: ACC/DSUB-Q2:

The action: "Reset" can now also be executed when AC-coupling is set.

New dialog for configuring the devices' interfaces

If no new devices are found by means of the device search, the new dialog for configuring device interfaces can be opened. This dialog can additionally be manually accessed from the menu ribbon (*Setup-Configuration > Device interfaces*). The predecessor program "imc DEVICES Interface Configuration" can be called via the new dialog's button "Advanced Configuration".

Devices which are not configured appropriately for the PC are listed under "Currently not reachable". For these, a configuration suggestion is automatically provided, which can be implemented in the device by selecting "Apply".

Once the configurations are applied, the device is displayed under "Recently reconfigured" to ensure a clear overview even when many devices are present. Additionally, all other devices are displayed under "Ready for measurement".

6.12.4 Panel

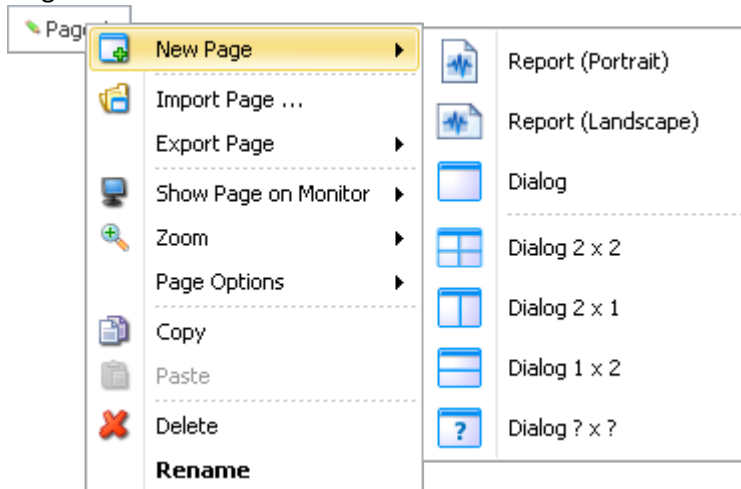
Variables for resource consumption

The Variables-class of the system information has been expanded. Previously, this class could be used to query the status of the data storage media in the device or of the PC hard drives, for example. Now these variables can also be used to get the current process information. In this way, you can supervise imc STUDIO's resource consumption.

This information will provide a timely notification of when the storage medium will be full, for example. Or, for measurements of long duration, the system's resource consumption can be regularly monitored to ensure that the remaining available resources are still adequate for continued operation.

Revised context menu

- The context menu of the Panel page tabs features a new structure, and a quick way to created pages in a targeted manner.



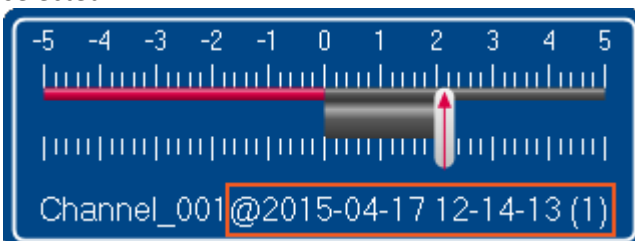
- By means of the context menu for variables in the Data Browser, it is possible to display the selected variables in free-floating curve windows or in the "Current Values" window.

Skin

Prior to saving a new skin, a new preview is now always available. This makes it easier to check the result in advance. The old menu items "Preview" and "Save As" have been combined.

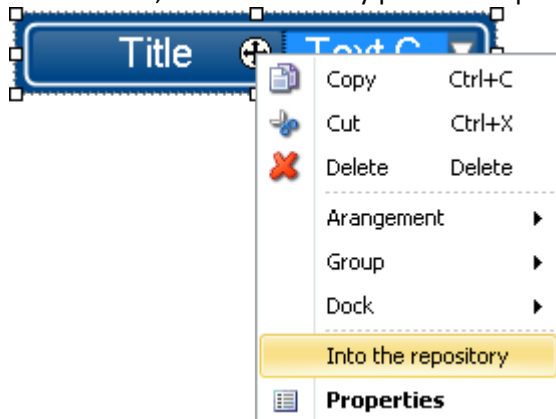
Measurement name in the title

For the source of the displayed title, there is a new available selection: "Long Name". When "Long Name" is selected, then along with the channel name, the respective measurement name is also displayed. If the Widget is linked with a variable via a measurement number, the title displayed adapts to the measurement selected.



Widget and page repository

- The possibilities for adding Widgets or complete pages to the respective repository have been extended. For instance, it is conveniently possible to place items in the repository via the associated context menu.



- If the name of a saved page is edited in the repository, then when that page is retrieved from the repository, its name reflects the change accordingly.
- The default folder for the repository (root directory) has been relocated accordingly.
 %HOMEPATH%\Documents\imc\imc STUDIO\PanelPages
 %HOMEPATH%\Documents\imc\imc STUDIO\Widgets

New option: Panel > Panel Widgets > Widget configuration > Refresh rate of newly created Widgets

Specifies the refresh rate of Widgets which are newly created. If a Widget is created on a Panel page, it is assigned the refresh rate set here.

Auxiliary variables - All connected variables are described

If a Widget is linked with multiple variables by means of the function "Auxiliary variables", all connected variables receive a new value when the Widget is operated.

6.12.4.1 Widgets

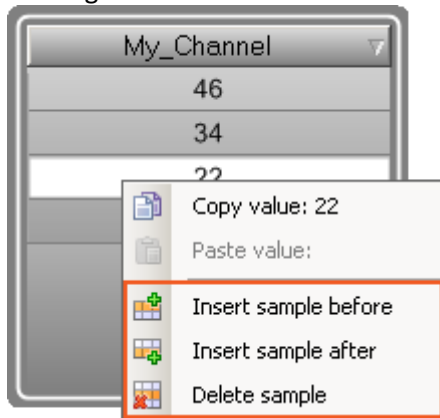
Curve window

- An Internet-Map can be used as the curve background, which updates according to the GPS-data displayed.
- The curve window toolbar can be activated/deactivated via the context menu.
- In imc DEVICES experiments, free-floating curve windows are used to view the measured data. In order that the curve window configurations not be lost when importing to imc STUDIO, the curve windows are also displayed in imc STUDIO. You can save the configuration of these curve windows and load them again into curve windows on the Panel pages. Thus, the configurations are also available in imc STUDIO.
- Level indicator: For channels having a measurement range, a level indicator has been implemented. This level indicator represents the current reading's distance from the measurement range as a bar. The display range of the respective channel displayed automatically adjusts to the measurement range set.

Widgets: Automotive, Industrial, Designer

Tables

- There is now an option for deactivating the changing of the columns' sequential order. This prevents unintended changing of the sequential order by accidental mouse-click over the title column.
- For user-defined channels, you can insert an additional measured value ("sample") before or after an existing value.



- Properties such as zones, which previously could only be set for each cell individually can now be defined for the entire column or table.
- A table's number of columns and rows can be automatically adapted to the channel linked. To do this, activate the new property "Automatic row count". To ensure that newly added cells have the same properties as the other cells, define these properties for the entire column/table.
- The background of the tables belonging to the groups "Automotive" and "Industrial" can no longer be set to Transparent. In this case, you should always use the Designer table.

Map

An enhancement of the curve window map makes it possible to display GPS-data and routes in an independent widget. The map is loaded from the Internet in accordance with the position displayed.

Standard meter

For the Standard meter, colored rings representing the zones have been implemented. In a similar way to the Potentiometer, this makes it possible to better accentuate the zones.



Bar graph

The value "0" is now the midpoint of the bar graph and no longer the range minimum, as previously. The midpoint can still be defined as desired and the pointer deflects from there in the respective direction as appropriate.

Input, Output > Text

The text-Widget is now able to display complex variables (e.g. the system-variables).

Standard Widgets

CCV-file selection dialog

The filepath can now be set as variable by means of placeholders. For instance, the experiment folder path could be set to always be used.

6.12.4.2 Navigation bar

Datcut - Sectioning the data stream

Measured data within a highlighted region in the curve window can be exported to the hard drive or transferred to imc FAMOS. There are multiple settings available as the pre-configuration.

6.12.4.3 Data Browser

New option: Project Management > General options > Load measurements

If this option is activated, saved measurements in the Data Browser are displayed.

In the Data Browser, it is also possible to filter by meta-data

Once columns for saving the channels have been selected by means of the Metadata Assistant, these columns can be added in the Data Browser. With the filter in the Data Browser, it is possible to select these columns and to filter them according to entry.

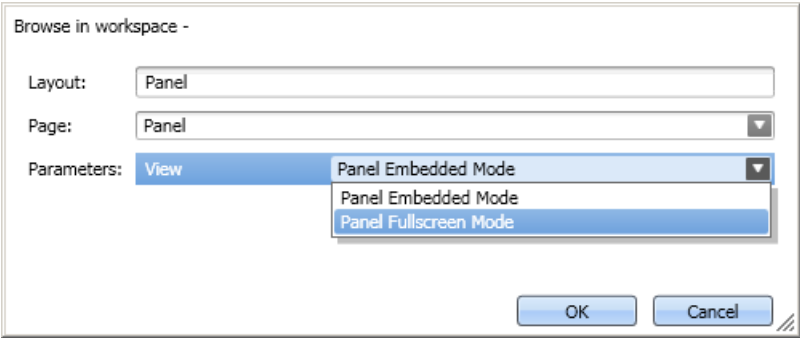
Drag&Drop for variables has been improved

Using Drag&Drop, it is now possible to move variables not only to the Panel page. Drag&Drop applied to variables from the Data Browser now also works for the following purposes:

- Data Browser to the free-floating curve window
- Data Browser to the file system in the Windows Explorer (only when saving of measured data is activated)
- Data Browser to the imc FAMOS Variables list (only when saving of measured data is activated)
- Data Browser to the imc FAMOS Sequence Editor

6.12.5 Commands

New functions

Command	Description
Browse in workspace	If the current view is to change over to the Panel, it can be started immediately in fullscreen mode. 
E-mail	In the address box and in the attachments, it is now possible to use placeholders.
Set measurement number	It is possible to delete the measurement number set from any measurement.
Data Saving Assistant	The command can be executed "silently". If the box: "Execute without request" is checkmarked, the command's selected default action is always executed without requiring confirmation from the user.
Export Variable	The option "Always overwrite existing files" has been added. If this option is activated, files of the same name in the target folder are overwritten without a confirmation prompt.

Revised functions

Command	Description
IF, (While) Loop and Switch	For commands, which evaluate the last dialog-response, the last response had previously not be reset when the Sequencer was re-launched. Now, these commands no longer apply the last response provided from the previous run of the Sequencer.
Export Variable	The option "Show dialog" has been subdivided into the options: "Show file options" and "Show variable options". In this way, some options can be protected.

Operation modified

Command	Description
Parameter set export	In the selection of variables, multi-selection had previously not been possible. Now, it is possible to add multiple variables for export simultaneously.
Delete variable	In the selection of variables, multi-selection had previously not been possible. Now, it is possible to add multiple variables for deletion simultaneously.
Data Saving Assistant	The operation of the checkbox: "Keep original files" has been revised to "Delete original files". In saved experiments, the setting is correctly converted accordingly. If the box had previously been checked ("Don't delete original files"), then it is now empty (for "Delete original files").

6.12.6 Sequencer-Events

Storage_DirectoryUpdate

The event "Storage_DirectoryUpdate" has been enhanced, so that additional information can be imported from the event via Scripting. E.g about the storage location. See also [Script type "Event-Script"](#) ²⁴⁶.

User-defined events

It is now possible to open the event configuration by double-clicking.

6.12.7 Data Processing

Configuring results channels in the Setup

For quick and clearly organized configuration of the results channels belonging to Data Processing-tasks, all results channels appear in the channel table in the main window: Setup. Here, the channels can be configured like the virtual channels belonging to imc Online FAMOS.

Multiple calculation sequences

Multiple independent, complete calculation sequences (**Tasks**) can be performed in parallel. Even ones of the same type. The calculations for the various tasks are automatically distributed to the different cores of a multi-core system. This evens out and improves the distribution of the demands for computational resources.

6.12.7.1 imc Inline FAMOS

Processing and analysis of measured data during a running measurement

imc Inline FAMOS is a functions package for Data Processing.

imc Inline FAMOS enables calculations to be performed on data streams from the measurement currently running. The calculations are performed on the PC, taking advantage of the PC's processing power. By contrast, with imc Online FAMOS, the calculations are performed by the device.

Scope of functions:

A number of pre-defined functions are available for calculation purposes. Most of the imc Online FAMOS functions are available in the same way and with the same syntax as in imc Inline FAMOS. There are a few additional functions exclusively in imc Inline FAMOS.

Cross-device calculations

In contrast to imc Online FAMOS, imc Inline FAMOS provides the ability to apply calculation operations to channels belonging to different devices, if the channels are assigned to Trigger_48 (measurement Start/Stop).

Displaying results:

The results generated are treated as device variables/channels. They are configured on the Setup pages (e.g. Storage) and can be displayed on Panel pages.

Tasks:

Multiple independent, complete calculation sequences (**Tasks**) can be processed in parallel. The maximum possible scope/amount of these tasks depends on the computational resources required by the functions used, in conjunction with the computational resources available to the PC used.

License:

A license must be purchased in order to use imc Inline FAMOS. In contrast to imc Online FAMOS, this license is not bound to the device used, but rather to the imc STUDIO installation on the PC.

Comparison: imc Online FAMOS / imc Inline FAMOS

imc Online FAMOS	imc Inline FAMOS
Device-based, classical real-time analysis	PC-based analysis of live streaming data diametrically different from imc FAMOS (post-processing of completed data sets)
Processing occurs where the data are captured, inside of the measurement device • no calculations across multiple devices possible • stand-alone capability	Processing occurs on the PC, and not where the data are captured. • Calculations across multiple devices possible (applies to all channels which are captured as of measurement start (Trigger 48)), optionally also of 3rd-party devices (via 3PDI) • not stand-alone capable • correspondingly reduced real-time reaction • conversely: use of the powerful and scalable PC-platform
Resolution of the calculations and results: 4 byte	Resolution of the calculations and results: 8 byte
Commonalities: • Live-analysis: immediate visual feedback • Processing of live data streams: running, not concluded, measurements (not post-processing) • Unified syntax, same scope of functions • Application of calculation operations to combinations of multiple channels assigned to the same trigger	

6.12.7.2 Powertrain Monitoring

The component imc STUDIO Powertrain Monitoring has been developed in close cooperation with **GfM (Gesellschaft für Maschinendiagnose mbH)** company, experts in machine and bearing diagnostics.

It is dedicated to diagnosis of powertrains. The powertrains can consist of motors, shift gearboxes and engines as well as devices for braking. The diagnosis can be used in field scenarios, test plants or end of line tests in a production.

Powertrain Monitoring offers two different kinds of diagnosis of vibrations: a **base diagnosis** on the basis of characteristic values and a **Advanced Diagnosis** on the basis of a frequency selective search of kinematic pattern.

A configuration for a specific gear type is created in the imc STUDIO project, from where it can be distributed to different test stations. In the actual application within the experiment, the inputs are assigned to the physical measurement channels according to the configuration selected. This system allows to use the same configuration on different measurement systems if multiple test locations are driven with the same powertrain type.

For Powertrain Monitoring, an extra license is required, which is available from imc Test & Measurement GmbH. It can be combined and operated with various basic editions of imc STUDIO.

6.12.7.3 Bus Decoder

Expansion package for decoding Fieldbus log channels

imc STUDIO BusDecoder is a package of functions for Data Processing.

This plug-in allows either all or individual measurement channels belonging to a log-channel to be decoded/extracted. A log-channel can be a logged Fieldbus communication ("Logfile").

The decoding information which is usually located in separate configuration files (e.g. with CAN in *.dcb) is instead embedded in the log channel. Thus, the log channel contains all information necessary for decoding. This provides more flexibility and dynamic capability for deciding on targeted extraction of individual channels from the compressed logfile.

The decoding is performed on the basis of the data streams of the measurement currently running on the PC. This utilizes the PC's computation resources.

The following functions are available:

- Decoding of either all or individual channels from a log-channel
- Resampling of the channels
- Saving of the result channels

The results generated can be displayed on Panel pages and saved with the associated measurement data. Subsequent processing by means of imc Inline FAMOS is also possible.

The following bus systems are supported:

- CAN
- SPI
- MVB (restricted)

6.12.8 Scripting

Revised functions

A Panel-script is now executed/stopped when the Panel page is entered/exited. Previously, this happened when the Design-mode was activated/deactivated.

New functions

- The class "ParameterValues" has been extended.
- The script type "Event-script" can be used for events which return additional information. In this way, information can be evaluated and reacted upon via the script. This has previously only been possible with the event "Storage_DirectoryUpdate", which returns such information as the storage location of completed measurements.
- Two more methods "PanelScriptInitialize" and "PanelScriptDispose" were added to the Panel script to simplify the use of Windows-Forms.

Operations modified

- The menu in the "Scripts" tool window has been revised.
- The tool window "Scripts" now has a context menu.
- The terms "Save as/Script storage" and "Script scope" were changed to "Storage scope" and "Activity scope".
- Exporting/importing script:
 - Multiple scripts can be exported/imported simultaneously. Multi-selection of scripts had previously not been possible.
 - For scripts which are imported, the Storage scope can be changed.
 - Binary export/import (*.dll) of scripts is now possible.

- Scripts can be ordered by name in the tool window.
- Scripts are ordered alphabetically in the command "Run script".
- Double-clicking on a script causes it to be opened in the Script-Editor.

6.12.9 Third Party Device Interface

Using the plug-in imc STUDIO Third Party Device Interface, it is possible to integrate devices from other manufacturers (3rd-party devices) into imc STUDIO and run them in the imc STUDIO system.

For this purpose, a C#-script is implemented which models the 3rd-party device's properties. There is a template which simplifies the process of seamlessly integrating the 3rd-party device and its channels into the existing settings menus and setup tables. In particular, this means that these devices/channels appear in the lists of devices and channels in the imc STUDIO Setup. This thus provides uniform operation style and configuration management. The script must additionally implement the interface to the 3rd-party device in the sense of a **data driver**.

The plug-in 3PDI is specially suited to enhancing a system configuration consisting of imc hardware with supplemental specialty devices and data sources. However, there is also a license available specifically for operation exclusively with 3rd-party devices, without the use of any imc devices.

Besides the developer framework and the licenses to run one's own self-provided scripts, ready-made implementations are also available for purchase.

All runtime licenses (for running 3PDI scripts) can categorically be operated with any edition of imc STUDIO.

To provide an overview, there is a 3rd-party device assistant, which manages the 3rd-party scripts. A license is required for executing 3rd-party scripts (at runtime). It can be operated/used with various standard editions of imc STUDIO.

A number of standard devices is already supported for this purpose and is available for selection via the Assistant:

Device	Description
AudioDevice	With the 3rd-party script "AudioDevice", it is possible to the computer's audio devices (such as the microphone input) as a data source.
ChannelLoader	The "ChannelLoader"-script enables files in the imc-format to be played back as a signal during a measurement.
FunctionSimulator	The template "FunctionSimulator" makes various signal types (sine, cosine, trapezoid, square wave, ...).
SimplePollDevice and SimplePushDevice	These 3rd-party scripts are executable templates and can be expanded accordingly.
AgilentInfiniiVision DSCO6014L (Digital Scope)	Integrates digital oscilloscopes, namely of the series Agilent InfiniiVision DSO 6014L. Requires separate expansion license "imc STUDIO 3PDI-DigitalScope".
fos4x	Supports devices of the manufacturer fos4x for measurements with fiber-optic sensors and optical strain gauges (Fibre Bragg, FBG). Requires a separate expansion license "imc STUDIO 3PDI-fos4x".

6.12.10 Monitor

Placeholder **EXPERIMENT.PATH**

The placeholder **EXPERIMENT.PATH** can now also be used in imc STUDIO Monitor, in order to find the path to the experiment file.

Activate/deactivate saving

Activation/deactivation of data storage in imc STUDIO Monitor has been enabled as a menu action. Thus, data storage can be controlled by a button on a Panel page , via the menu ribbon, or by means of the command: *Execute menu action*.

6.12.11 Video

Video codec "H.264"

The video codec H.264 from Leadtools is now supported.

6.12.12 Update Notes

6.12.12.1 SQL Placeholder

Such SQL placeholders used as: [SETUP.SQL](#), [EXPERIMENT.SQL](#), [MEASUREMENT.SQL](#) may need to be converted manually. The associated information is always outputted when an old experiment is loaded.

Background:

Column identifier with spaces in the name could not be resolved. In order to make this possible, the syntax needed to be revised. Column identifier are now always expected in apostrophes (' '). Old, saved placeholders (without the appropriate brackets) may in some cases fail to be resolved.

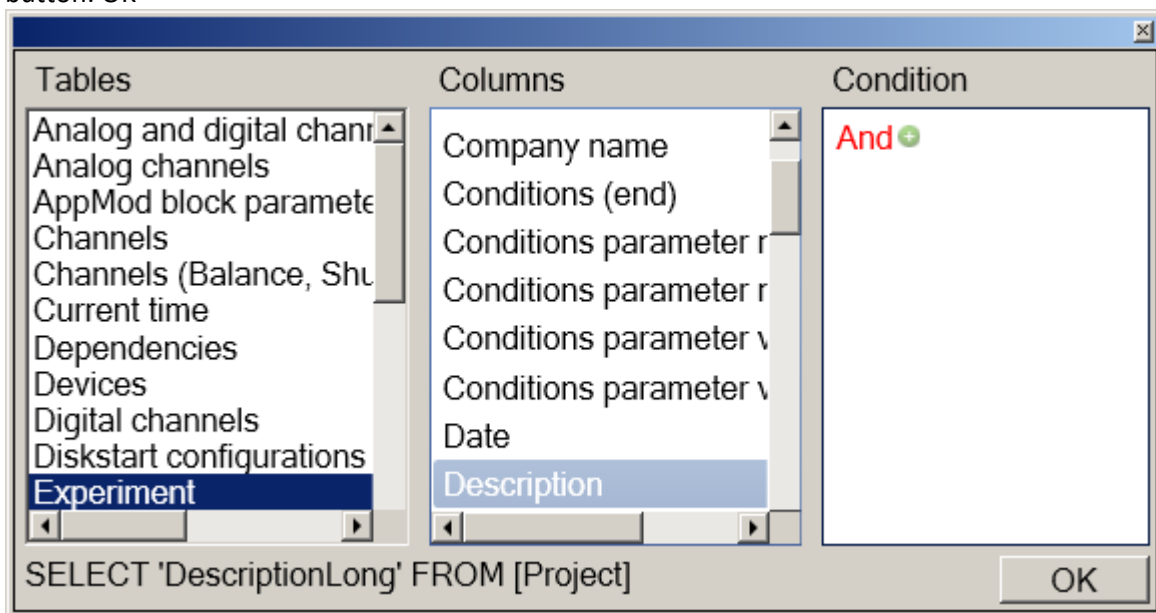
Correction:

If an SQL-placeholder is not resolved correctly, navigate to the position where the placeholder is used.

- Select the "green" text with the cursor



- Press the keys: <CTRL> + <Space>
- In the Assistant which opens consequently, the corrected syntax already appears. Simply click on the button: OK



The automatically corrected syntax is used:



6.12.12.2 imc Applikations-Modul - ExternalEditor

"If a dedicated "ExternalEditor" was written for an application, it needs to be revised upon updating to imc STUDIO 5.0R3.

In the class inherited from `API_ReturnValue_V1`, the following lines of code must be appended:

```
//new in the imc STUDIO 5.0R3 Version
public API_Vx GetAPI<API_Vx>() where API_Vx : class, IReturnValueBase
{
    return this as API_Vx;
}
```

In total, this would appear as follows:

```
class ChangedAppModZip : API_ReturnValue_V1
{
    public imc.Common.Interfaces.Logbook.API_LogbookEntry_V1[] Error
    {
        get { return new imc.Common.Interfaces.Logbook.API_LogbookEntry_V1[]{}; }
    }

    public bool HasChanges
    {
        get { return true; }
    }

    public bool HasErrors
    {
        get { return false; }
    }

    //new in the imc STUDIO 5.0R3 Version
    public API_Vx GetAPI<API_Vx>() where API_Vx : class, IReturnValueBase
    {
        return this as API_Vx;
    }
}
```

6.13 imc STUDIO 5.0R1 build February 08, 2015

Minor bug fixes.

6.13.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.13.1.1 Firmware imc DEVICES 2.8R5 SP11 dated July 23, 2015

Hardware

CRPL/ISO2-8

With CRONOS-PL ISO2-8, a +/-12V bipolar sensor supply by means of a characteristic curve file is now possible. #22948

CRONOScompact/HRENC

Firmware implemented with accelerated data throughput for PV-variables. #22819

CAN Send

If a node is set to Extended or Extended+ format, a message can be send as extended or as standard-format.
#21279

6.14 imc STUDIO 5.0R1 build September 15, 2014

- Minor bug fixes.
- imc Online FAMOS - It had only been possible to create OFA_Event-channels for one device, since the channel name was not unique. Now, the device name is always appended to the channel name. This makes it possible to create channels in multiple devices.

6.14.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.14.1.1 Firmware imc DEVICES 2.8R5 SP10 dated January 30, 2015

No changes.

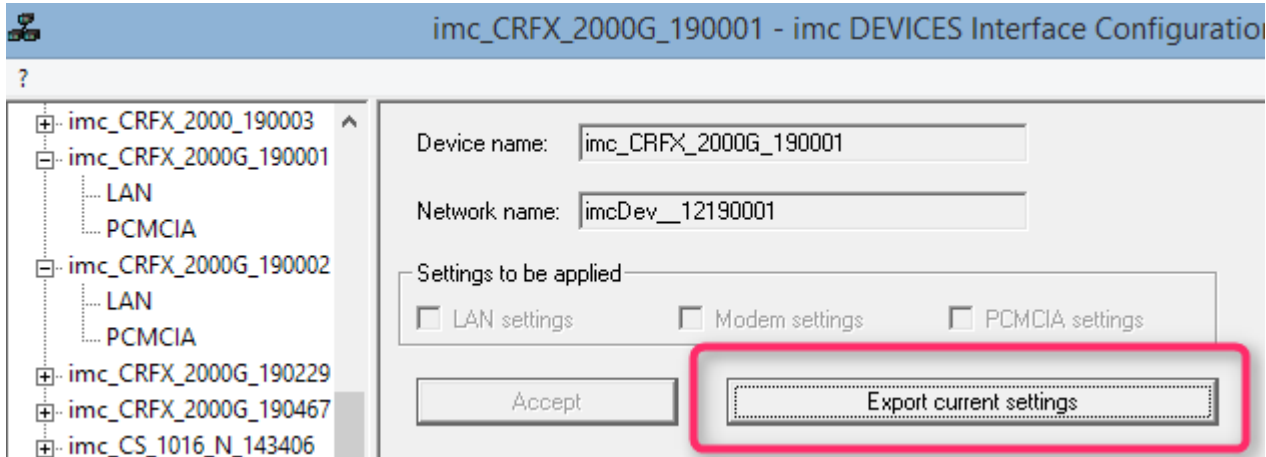
6.14.1.2 Firmware imc DEVICES 2.8R5 SP9 dated January 19, 2015

Hardware

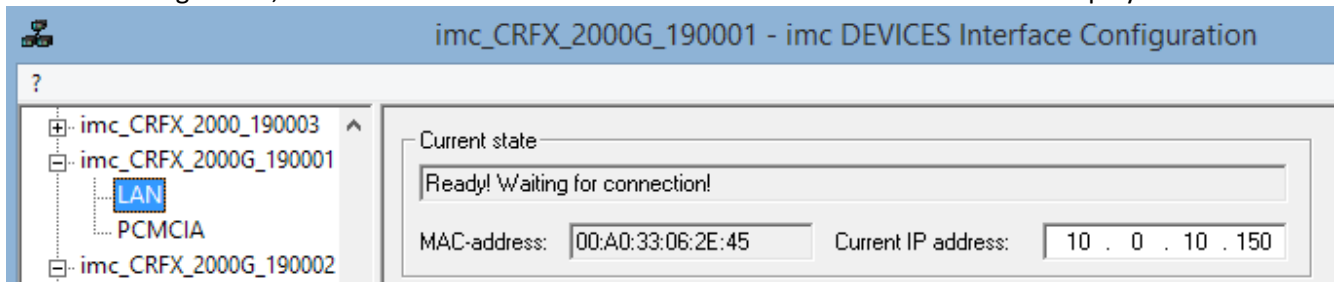
- CRFX/B-8
Version with bipolar sensor supply added: 5 V, 10 V, 12 V, ± 15 V, 24 V
- SPARTAN-T with OSC-16
Supported low pass filters are 16.6 Hz, 50 Hz, 60 Hz, 200 Hz and 400 Hz.
- CRFX/ISOF-16-D37-SUPPLY
Bipolar supply has been added.

imc DEVICES Interface Configuration

- The interface settings can be exported now.
Using the button "Export current settings", it is possible to export the interface settings currently applicable in the device to a file. The device folder is automatically the destination and the suggested filename is the device name with a suffix.



- If the IP-settings allow, the MAC-address for the LAN- and WLAN-interface is found and displayed.



imc Messaging

- For E-Mails, encryption with SSL3/TSL1 is now supported.
- When sending E-Mails, the Port number can be specified via the configuration file (msg-file).

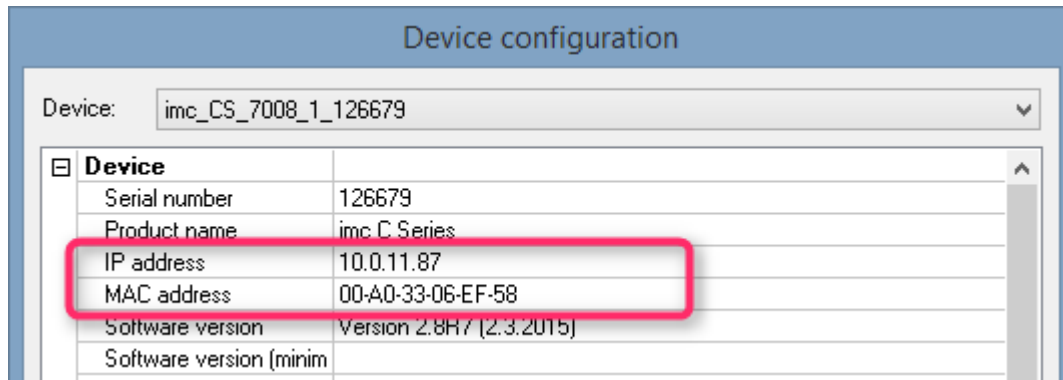
6.14.1.3 Firmware imc DEVICES 2.8R5 SP8 dated September 18, 2014

Synthesizer

Error messages now also contain the name of the device and the slot number.

Device properties

IP address and the MAC-address have been added.



The screenshot shows a 'Device configuration' window. At the top, there is a dropdown menu for 'Device:' with the value 'imc_CS_7008_1_126679'. Below this is a table with the following properties:

Device	
Serial number	126679
Product name	imc C Series
IP address	10.0.11.87
MAC address	00-A0-33-06-EF-58
Software version	Version 2.8H7 (2.3.2015)
Software version (minim	

The 'IP address' and 'MAC address' rows are highlighted with a red rectangle.

CRFX- ICPU2-8

0.07 Hz high-pass filter implemented.

ITPCom-Assistant

Signal selection screening for IPTcom has been added.

6.15 imc STUDIO 5.0R1 build May 15, 2014

- Minor bug fixes.
- User Administration

In order to be able to use the up-to-date user administration also in different projects or on other computers, you can export it and then import it at the intended destination.

6.15.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.15.1.1 Firmware imc DEVICES 2.8R5 SP7 dated August 05, 2014

LIN-Bus Power Management

LIN *PowerManagement commands* (Wakeup, Sleep) can now be triggered by a Display variable.

6.15.1.2 Firmware imc DEVICES 2.8R5 SP6 dated June 24, 2014

imc BUSDAQ-Autostart

Improved error handling for devices having Autostart.

6.15.1.3 Firmware imc DEVICES 2.8R5 SP5 dated April 24, 2014

LIN

Import of LIN configurations via COM interface has been implemented.

6.16 imc STUDIO 5.0R1 build March 05, 2014

6.16.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.16.1.1 Firmware imc DEVICES 2.8R5 SP4 dated March 27, 2014

Desktop symbol for device access



imc Systems

"imc DEVICES" is now called "imc Systems" and has a new desktop icon.

6.16.1.2 Firmware imc DEVICES 2.8R5 SP3 dated March 5, 2014

No changes.

6.16.2 Documentation/Help

Document	Section	Description
Index	General Notes	Structural revisions; Minor content changes made
Setup - Advanced Device Functions	imc REMOTE WebServer	New
	imc Display Editor	Structural revisions
	Synchronization	Structural revisions; Changes concerning the conversion to 5.0R1
	Device Hard Disk, removable drive	Structural revisions; Changes concerning the conversion to 5.0R1
	Trigger and Events	Structural revisions; Changes concerning the conversion to 5.0R1
	Fieldbusses > Application-module	Structural revisions; Changes concerning the conversion to 5.0R1
	Fieldbusses > General notes on Fieldbusses in imc STUDIO	Structural revisions
imc STUDIO (general)	Ribbon > Extra Menu > Options	"Variables Options" is now called "Save current Measurement Data"
Scripting	All	Revised for 5.0R1 and many amendments made
Video	All	New
Devices manuals	imc CRONOS System Family	Updated
	imc C-SERIES	Updated
	imc BUSDAQ	Updated
	imc SPARTAN	Updated

6.17 imc STUDIO 5.0R1 build November 14, 2013

6.17.1 Firmware and new hardware

This imc STUDIO version has been released along with the following firmware and devices driver packages (imc DEVICES).

6.17.1.1 Firmware imc DEVICES 2.8R5 SP2 dated December 13, 2013

TEDS: Adopting channel names

When the channel name is adopted, the device name is no longer appended if there is only one device in the experiment.

6.17.1.2 Firmware imc DEVICES 2.8R5 SP1 dated November 13, 2013

CRFX/SYNTH-8

Module CRFX/SYNTH-8 is now supported.

6.17.1.3 Firmware imc DEVICES 2.8R5 dated October 9, 2013

6.17.1.3.1 Hardware

CRFX/ISO2-16-2T

Module CRFX/ISO2-16-2T is now supported.

CRFX/ISO2-8

PT1000 characteristic curves are supported for CRFX/ISO2-8, if the amplifier has been prepared accordingly.

CRFX/HV2-2U2I and CRFX/HV2-4U

New HV-modules. (Among other things, input impedance increased to 1 MΩ.

ACC/DSUBM-ICP2I-BNC

Module ACC/DSUBM-ICP2I-BNC is now supported for selected amplifier types.

Device series / Amplifier	CR-SL/-PL C-SERIES (-N)	CRC	CRFX
UNI2-8, DCB2-8, B-8 Cx-70xx, Cx-50xx	✓	✓	✓
LV3-8, Cx-12xx	✓	✓	✓
ISO2-8, Cx-41xx	✓	✓	✓
ISOF-8	---	✓	✓
UNI-4	---	✓	✓
BR2-4, Cx-60xx	✓	✓	✓
SC2-32	✓	✓	---

- Module not available for this device series
- ✓ Full software support by imc STUDIO 5.0 R1 (imc DEVICES 2.8 R5)
- ✓ Plug is compatible for basic functionality
No complete software support
(no TEDS, limited offset compensation)

Bridge supply

Supply voltage options of 1 V and 2.5 V for the following amplifiers: UNI-8, UNI2-8, DCB-8, DCB2-8, B-8 in all device types (CRPL, CRC, SPARTAN and CRFX). The necessary prerequisite is custom commissioning or modification by imc. There is no possibility for the user to select a different "setting" in the software.

imc DISPLAY

The graphical Display has been expanded by an additional item "Stop measurement". By means of this item, it is possible to stop the current measurement in the device connected to the Display, after which a new experiment can be loaded.

Filter

- The bandpass filter default values have been changed to the two lowest frequencies.
- Filter frequencies with imc CRONOSflex (CRFX) has been updated.

CRFX amplifier	previously	new as of imc DEVICES 2.8 R5
UNI2-8, DCB2-8, B-8	50 Hz	10 Hz
LV3-8, ICPU2-8	50 Hz	10 Hz
UNI-4	50 Hz	10 Hz
ISO2-8	20 Hz	2 Hz
HV2-2U2I		10 Hz

Characteristic curves

The following amplifiers support "user-defined characteristic curves":

Device family / Amplifier	CR-SL/-PL, C-SERIE (-N)	CRC	CRFX
UNI2-8, DCB2-8, B-8	⊘	⊘	✓
LV3-8, ICPU2-8	⊘	⊘	✓
UNI-4	⊘	✓	✓
ISO2-8, C-41xx	✓	✓	✓
HISO-8	✓	✓	⊘
ISOF-8	---	⊘	(✓)
SC2-32	✓	✓	---
OSC	⊘	⊘	---
HV-2U2I, AUDIO-4, C8	⊘	⊘	⊘
HV2-2U2I	---	⊘	✓
BR2-4	⊘	⊘	⊘
QI-4, AUDIO2-4	---	---	⊘

- Module not available for this device series
- ✓ as of imc DEVICES 2.7 or higher
imc STUDIO 3.0 R4
- ✓ as of imc DEVICES 2.8 R5
imc STUDIO 5.0 R1
- ⊘ Feature currently not supported

uDisk

A new CF-card type, iCF-9000, is now supported.

WiFi (WLAN)

New WiFi (WLAN) module

As of imc DEVICES 2.8R5, devices having serial numbers 19xxxx and higher support Dual Band WiFi (WLAN) modules. When selecting the channel number in imc DEVICES Interface Configuration, channels 1 through 13 correspond to the 2.4 GHz frequency band; channels 36 and above to the 5 GHz frequency band.

6.17.1.3.2 Fieldbus

LIN-Bus

Effective immediately, the LIN-Assistant supports the import of LDF-files of Version 2.1.

ARINC

- It is now possible to sort the sending channels.
- A new data format *.idb2 is supported, which also records Parity-Bit and SSM information.

6.17.1.3.3 General Changes

Manuals

The user's manuals for the devices and the documentation on the software have been updated.

imc Application module

Due to new functionalities, applications which were created with older imc DEVICES versions could no longer be loaded.

In order to be able to load an old application, it may be necessary to create again the current development environment.

imc Online FAMOS

- The following functions are supported: BitXOR & BitNot.
- By clicking on Function/Description, the sorting function can be adjusted accordingly.
- Vector-handling has been enhanced with local vectors. Now, functions with 2 results vectors are supported, e.g. FFTAmplitudePhase(AmlSpec_Local, PhasSpec_Local, ...), where AmlSpec_Local and PhasSpec_Local must be declared as local vectors in the OnInitAll-block.
- Enhancement of the OFA Pro functions involving vectors: The results are now treated as vectors (previously, individual vector elements were single values). In consequence, it is now possible to make assignments of local vectors to vectors created with VectorStatic() and VectorChannel().

TCP/IP-Config

As of imc DEVICES 2.8R5, the interface program TCP/IP does only support devices of group 1 (see device overview in the manual).

Data format

The header files of saved channels now contain information on the version, device network name and storage location.

Synchronization with NTP

New entry in device properties "NTP: Interval [s] (min,max)". A the synchronization interval can now be limited in a min and max interval.

imc REMOTE

imc REMOTE WebServer now allows creation of Panel pages.

Saving data to a network drive

For experiment having an Autostart, whose data are saved to a network drive, it is now possible to set a maximum delay time for the purpose of mounting the network drive.

UDP Status Monitoring

The tool "UDP Status Monitoring.exe" has been added to the imc DEVICES CD under Tools, or in imc STUDIO under the imc DEVICES folder Tools.

6.17.2 General Notes

- A new imc STUDIO Edition "Runtime" is available. It provides the loading and executing of experiments, that were created with higher editions.
- imc STUDIO 5.0 is compatible with Windows 8.
- The splash screen as well as the imc STUDIO icon have been re-designed.
- The tool windows can be closed and opened.
- The Navigation pane can be hidden.

6.17.2.1 New views

- imc STUDIO starts with a new, simplified view offering all important functions for measurement and visualization.
- New views are available: "Standard", "Compact" and "Complete".

- The Automation- as well as the Sequencer-Editor are hidden both in the "Compact" view and in the "Standard" view. To see these components, either a different view must be selected or the Navigation pane must be displayed. However, execution can occur independently of the view.
- The views "imc", "imcB1", "imcT1" and "imcT2" have been eliminated.

6.17.2.2 Installation/Product Configuration

- The installation setup has been revised, so that for example, imc FAMOS prompts for confirmation to install if a different version of imc FAMOS is already installed.
- The product configuration as well as the product information have been revised.
- After the product configuration has been changed, the necessary restart of imc STUDIO is offered directly in the product configuration dialog.

6.17.3 Setup and Device Control

- The function "Statistics" provides a quick overview of the hardware used in the experiment, as well as of the channels used.
- The module serial number can be added as a column in the Setup and exported as metadata to the saved measured data.
- The channel type "DAC-Outputs" has been renamed to "Analog Outputs".
- There is a new Setup-page for GPS channels.
- The icons in the Setup have been replaced with new icons.
- Complete layouts could previously only be added by means of the "Layout-repository" tool window. Now there is the additional option to add it via the Setup-pages' context menus.
- Changing the behavior of the device variables: Upon loading the experiment, the device variables are now consistently initialized with "0", where the only exception is the device variables, which have an initial value, such as Tunable Parameters from imc HiL or Application Module applications. These are initialized upon loading with the value saved in the application.

6.17.3.1 Assistants

- The assistants (e.g. CAN-Assistant) are only offered now if they are supported by devices used in the experiment.
- Calling imc CANSAS is only offered now if imc CANSAS is installed.
- The assistant for the Application Module's RoadDyn application is available.

6.17.3.2 Progress indicator for device actions

- The window size is adjustable.
- It is possible to scroll in the window.
- For some device actions such as bridge balancing, the progress indicator now displays specific names instead of numbers as hitherto.

6.17.3.3 Supplemental files

- Supplemental files (e.g. characteristic curves (*.dat) and Messaging-files (*.msg)) can be listed, imported, exported and deleted within one dialog.
- Importing/exporting of imc Online FAMOS files is possible.

- Changes to supplemental files are now detected. Before the start of the next measurement, the device is downloaded automatically and the changes are thus transmitted to the device.

6.17.3.4 Measurement settings

- Synchronized start: The default wait time of 4s was too short for experiments involving many devices. The default time has now been raised to 10s.
- It is possible to perform shunt calibration during measurement and the value is displayed.
- The function "Export configuration" provides the export of adjustment values as well as single columns of the current Setup page.
- Adjustment values can be imported.
- The tab "Trigger Events" has been eliminated because all the settings it offered are available on the "Trigger"-page.

6.17.3.5 Saving measured data

- It is possible to save measured data after measurement (the content of the circular buffer, for display and calculations):
 - Save current measurement: Saves all channels without offering a selection of the path; the path to be used, as well as the channel selection, can be set under Options.
 - Save current measurement as: Before saving the data, the path can be selected; the channel selection is set under Options.
- Under Options, the behavior of the "suspend data saving"-button can be specified. This makes it possible to start the measurement without saving of data and then to activate data saving only upon clicking on the button. The precondition for this is that the channels are selected for saving in the Setup. The button's default setting is for the data to be saved when the measurement starts.
- The storage path for the measured data, as well as the measurements' names can be set freely; see [user-defined measurement storage](#)  261.
- Access to saved measurements and their corresponding metadata is possible by means of the placeholder MEASUREMENT, see [Placeholders](#)  261.
- Under the tab "Data Transfer" for the individual channels, the device-specific data storage options are shown.

6.17.3.6 Channel Name Assistant

- The preview is now highlighted.
- The preview illustrates exemplary the first three names.
- For the format element "Column value", the parameters "Connector" and "Module number" are now available.

6.17.4 Parameter set

- Using the parameter set export capability, it is possible to export individual parameters of a Setup page. This selection can be activated under Options.
- Import/export of parameter sets could previously only process files in which the variables were arranged in rows and the parameters in columns. Now it is also possible to process files in which the variables were arranged in columns and the parameters in rows .

6.17.5 Metadata Assistant

- The internal names of parameters which were saved in the channel file have been replaced.
- In the Expert view, individual columns of the Setup pages can be selected for export.

6.17.6 Panel

- The Design mode is always available in the Panel-page's context menu and can thus be quickly activated/deactivated. The exception is the fullscreen mode.
- A zoom function for Panel-pages has been introduced.
- The Panel's menu has been subdivided into "Control", "Navigation" and "Design".

6.17.6.1 Widgets

- In order to execute a menu action, there is a dedicated widget "Execute menu action". This automatically shows the picture of the action selected.
- With the widget Input > Numerical it is now also possible to change individual digits of a number using the keyboard and scroll wheel (arrow up/scroll up: increase value, arrow down/scroll down: decrease value). To do this, the desired digit/s must previously be selected.
- The visibility of curve windows can be set.
- Tables: Text which matched variables' names were always resolved. Now, when a variable's name is entered, the name is always displayed. If the variable's value is desired, it must be written in arrow brackets (<>).
- The pushbutton's LED can be hidden under Properties; with newly created pushbuttons it is hidden by default.
- The Standard meter now has the property "Zone Representation".
- The widget property "Factor" has been augmented with the setting "auto". This adds an appropriate prefix (e.g. kilo-, milli-) to reflect the value.

6.17.6.2 Navigation bar

- The Playback function is available.
- It is possible to navigate curve windows connected with xy-data sets (e.g. GPS) (note: the background must be set to "Map"):
 - The position slider control is displayed as a circle, like with curve windows which are not linked with the Navigation bar.
 - The Navigation bar's Zoom/Rezoom function does not affect these curve windows.
 - These curve windows are not considered for in the calculation of the visible range.

6.17.7 Data Browser

- The displayed names of measurements are now no longer necessarily the respective measurement's time stamp. The measurement data folder's name is used. For example, for "continuous numbers" the number is displayed. In consequence, the measurement's number also appears in parentheses after the time stamp. If [user-defined measurement storage](#)^[261] is used, the name set there is displayed in the Data Browser.
- The grouping by category (e.g. channel type, "User-defined variable", "imc FAMOS") in the Data Browser can optionally be switched off. This setting is made under Options.

- Variables can be grouped by entering a point: e.g. the variables "Axis.x" and "Axis.y" yield a node "Axes" in the Data Browser, under which the variables "x" and "y" are found. It is also possible to group across categories (meaning: independently of the channel type, for instance). To do this, grouping by categories must be switched off (see previous item).
- The traceability of the measurement settings (Data Browser "Load Measurement settings") can be switched off under Options. If the traceability is not required, it is possible to save memory space in this way.
- A filter list is available. Some predefined filters are provided. Additional filters can be created.
- An option is available, whether the assigned symbolic measurement number shall be saved or not.
- Measurements are loaded automatically when one of their channels are linked with Widgets. This behavior can be changed in the Options.
- By means of the context menu, the measurement's name or the fixed channel name can be copied to the Clipboard.

6.17.8 User-defined variables

- The dialog for creating variables has been completely revised.
- User-defined channels can be linked to triggers, report channels must be linked to triggers. If the user does not specify any trigger for the report channel, it is linked to the measurement's start and end. While the trigger is active/during the measurement, data can be written to the channels.

6.17.9 Placeholders

- MEASUREMENT: This is a new placeholder for accessing saved measurements. By means of this placeholder, it is possible to inquire for example the following properties by referencing the measurement name:
 - the measurement's storage path,
 - metadata saved with the measurement
 - start time.
- VARS["example"].PROPS: Using the placeholder PROPS, it is possible to access the properties of variable, e.g. the unit.
- STORAGE: The STORAGE-placeholders are only provided for the purpose of configuring the [User-defined measurement storage](#)²⁶¹.
 - STORAGE.FOLDERNAME: Finds a folder name from the storage settings (e.g. 2013-01-01 08-00-00 (1)) The result may change during a measurement, e.g. if interval saving is activated. With this placeholder, you ensure that every measurement result is assigned to its own folder.
 - STORAGE.MEASUREMENT: Returns the time and date of the measurement's start (e.g. 2013-01-01 08-00-00). The result remains constant until the end of the measurement. By this means, it is possible for example to assign each measurement's its own permanent folder.

6.17.10 Project Management

When loading/saving experiments, a progress indicator is displayed.

6.17.10.1 User-defined measurement storage

- The root folder for the measured data folders can be moved to a different path than the experiment path.
- The names of measurement data folders can be set individually.
- [Placeholders](#)²⁶¹ can be used.

6.17.11 User administration/access rights

The following can be managed by means of user access rights:

- Changes of the product configuration,
- Display of the Options dialog, and
- Opening the Options dialog from the Panel fullscreen mode.

6.17.12 Commands

- The command configurations have been revised, so that they only close in response to explicit clicking on "OK"/"Cancel".
- The command "Set Variable" has been moved to the group "Variables".

6.17.12.1 Variables commands

- The Variables commands have been completely revised.
- Placeholders can be used.
- Along with *.dat and *.raw, additional import- and export formats are possible, e.g. *.csv and *.aet.
- Exporting variables:
 - If all variables are to be saved to a file, the filename can be specified.
 - Variables can be exported from saved measurements.
- Importing/loading variables:
 - Along with the folder, it is also possible to specify individual files.
 - Individual file elements can be selected from a file.
- With "Load Variable", it is possible to specify a category, if the category specified for the variables in the source file is not to be applied.

6.17.12.2 New commands

- Stop Sequencer: Stops the Sequencer (group: Flow control)
- Data Saving Assistant: After the measurement is stopped, it is possible to prompt for whether to discard or save the measurement. Additionally, metadata can be saved with the measurement and also the whole measurement can be exported.

6.17.12.3 Revised commands

- imc FAMOS Sequence
 - It is possible to debug the FAMOS Sequence.
 - Result data of a FAMOS-sequence can now be saved.
 - If imc FAMOS is opened from the command, the variables "from FAMOS" in the variables list are displayed in imc FAMOS.
- Set Measurement Number: Use of placeholders is possible.
- Show message box: The "Cancel"-button can optionally be hidden.
- Execute menu action:
 - The selection box has been renamed to "Action".
 - The individual menu actions in the selection list are now grouped differently, so that individual actions are easier to find.

- In addition to the selected action, a note on the action is displayed.
- Menu actions which can have two states can be controlled distinctly. An example of this is the action "Design mode", with which it is possible to activate/deactivate the Panel's Design mode in a systematic way.
- The command "Connect and transfer settings" has been renamed to "Transfer device settings".

6.17.13 Sequencer

- The column "Stop on error" can now be configured. It is possible to set whether to stop the Sequencer and if yes, for what errors or warnings.
- The result of the last dialog which was called from the Sequencer, can be evaluated in If-, Switch- and While-conditions, so that it is possible to react on it. The dialogs which can be evaluated are "Show message box", "Panel-page as dialog".
- During the Sequencer is running, canceling dialogs no longer stop the Sequencer. If that behavior is still desired, the result of the respective dialog need to be evaluated. If the dialog response is "Cancel", the command "Stop Sequencer" must be inserted.

6.17.13.1 Events

- Project_Loaded: The event is triggered when the project was loaded.
- Storage_DirectoryUpdate: The event is triggered, when a measurement folder is completed or updated.
- Timer-event: The time interval can be changed subsequently.
- For user-defined events, a scope can be defined.

6.17.14 Data Processing

Processing of single values is possible.

6.17.15 Scripting

- The script examples have been augmented.
- Scripts can be imported and exported.
- The functions "Delete", "Edit", "Run" and "Regenerate Proxys" have been collected under the menu item "Edit".
- Scripts can be assigned to a context. For example, scripts can be defined which start automatically when the experiment is loaded.
- There are type library scripts to which one can write one's own classes and which can be integrated by other scripts.
- There is a class in which the possible values of device and channel parameters can be provided as constants.
- Attach to the STUDIO process for debugging a script can be made directly by means of an button in the toolbar.

6.17.15.1 Functions

- It is possible to generate Windows buttons and forms in the Editor included and to embed them in Panel-pages.
- The position and size of widgets can be set.
- Commands can be called from the script. They can easily be selected and parameterized using a dialog.

- User-defined variables can be set up with a scope. They appear in the Data Browser in the group "Scripting".
- Devices can be added by their IP address or the DNS-name.

6.17.15.2 Curve windows and imc FAMOS

- Access to the imc FAMOS kits is possible. In particular, this makes it possible to access curve windows in the Panel via the imc FAMOS Curve Window Kit.
- Curve window configurations (CCV-files) can be loaded.

6.17.15.3 Dialogs

By altering *.csscript to *.cs it is now possible to create forms in the SharpDevelop-Editor. The available selections are "WPF User Control" and "WPF Window".

6.17.16 Logbook

- The logbook has been completely revised.
- In the logbook window, it is possible to filter by categories (information, warnings and errors) and by texts (Search).
- In the Options, you can set whether the logbook opens when information and warnings appear.
- Duplicated messages are grouped and the amount of duplicate messages is stated in parentheses.
- The complete messages (including sender, etc.) can be copied.
- The messages displayed can be deleted.
- The current logbook can be sent via e-mail from the Logbook tool window.
- The logbook viewer offers the ability to open and browse through old logbook files.

6.17.17 Documentation/Help

Document	Section	Description
Shared Components: Command Reference	If / Switch / Loop-While	New: Evaluating the last dialog's answer
	Stop Sequencer / Open Logbook viewer / Delete Panel page/ Export Variable / Import Variable / Load Variable / Delete Variable / Data Saving Assistant	New: Command description
Setup	Setup pages	The channel Setup pages have been splitted into channels and variables
	Setup pages > Trigger	Trigger event dialog has been removed Description was moved to Setup page Trigger
	Ribbon	Ribbon revised partly
	Setup page > Experiment/Documentation	Experiment page renamed to Documentation page
Setup - Advanced Device Functions	Controlling data storage > Targeted data saving or saving subsequent to measurement	New: Save current measurement
	Controlling data storage > Measurement storage area	New

Document	Section	Description
Panel	Ribbon	Ribbon revised partly
	Widgets > Operation > Editing	Example: It has been pointed out that the Widget consists of two standard meters
	Tool Windows	Added Tool Window group with Data Browser and Properties
imc STUDIO (general) and Getting Started in parts	System requirements	Win 8 added
	Installation - Preparation	Update description from imc STUDIO 3.x and 4.x
	Installation	Installation description updated
	Product configuration / Licensing	Updated and amplified with Edition Runtime
	Info / Version Information	Updated: New Configuration dialog
	Start	New: Start with new, simplified views described
	Command Line Parameters	Updated: Starting an experiment from the data base
	Navigation pane	Updated: Show and hide
	Tool Windows > Operation	Tool window chooser: Showing/hiding the tool window
	Tool Windows > Logbook	Revised completely
	User Administration	Removed: Login without user administration (no longer necessary)
	Extra Menu	Options amplified
	Installing additional languages	New
Scripting	All	Revised completely
Devices manuals	imc_CRONOS-series_Manual	Updated
	imc_BUSDAQ_Getting_Started	Updated
	imc_BUSDAQ_Manual	Updated

6.17.18 Update Notes

- imc STUDIO starts with a new, simplified view offering all important functions for measurement and visualization. This view does not show neither Sequencer nor Automation. For experiments, that use these plug-ins, change the view to "Complete" or open the Navigation pane via Extras > View > Toll Windows. In the new default view, also the available actions in the ribbon are reduced. If the complete menu is required, switch also to the view "Complete". Notes and descriptions can be found in "Getting Started" as well as the help.
- During the Sequencer is running, canceling dialogs no longer stop the Sequencer. If that behavior is still desired, the result of the respective dialog need to be evaluated. If the dialog response is "Cancel", the command "Stop Sequencer" must be inserted. The execution of commands connected to any events or Widgets is still stopped when a dialog is canceled.
- Scripts in experiments, that are created with version 4.0, shall be compiled after conversion. Detaillied notes on this topic can be found in section "Important notes" in the "Scripting" help.

7 imc STUDIO 4.0

7.1 imc STUDIO 4.0R1 build July 30, 2013

7.1.1 Firmware and new hardware

7.1.1.1 Firmware imc DEVICES 2.8R3 SP14 dated October 9th, 2014

SYNTH-8

Error messages now also contain the name of the device and the slot number.

7.1.1.2 Firmware imc DEVICES 2.8R3 SP12 dated August 3rd, 2014

No changes.

7.1.1.3 Firmware imc DEVICES 2.8R3 SP11 dated June 24th, 2014

CRFX/ISO-16-D37

Now, firmware is implemented in version 2.8R3SP11, too.

7.1.1.4 Firmware imc DEVICES 2.8R3 SP9 dated December 13th, 2013

Keine Änderungen

7.1.1.5 Firmware imc DEVICES 2.8R3 SP8 dated October 30th, 2013

No changes.

7.1.1.6 Firmware imc DEVICES 2.8R3 SP7 dated Juli 30th, 2013

Adopting the channel name from TEDS (imc STUDIO)

When taking over the channel name, the device name will no longer be added, if only one device in the experiment is being used. Only in imc STUDIO context. [IT 9667]

UDP Status Monitoring.exe

The tool "UDP Status Monitoring.exe" has been added on the imc DEVICES CD under Tools, or respectively in imc STUDIO under the imc DEVICES folder Tools.

CRFX\DO, CRFX\DI and CRFX\DAC

As of imc DEVICES 2.8R3SP7, the modules CRFX\DO, CRFX\DI and CRFX\DAC are supported!

DSUB-ICPI-BNC

DSUB-ICPI-BNC (isolated ICP) is now supported for CRONOScompact by imc DEVICES version 2.8R3SP7.

7.2 imc STUDIO 4.0R1 build May 07, 2013

7.2.1 Firmware and new hardware

7.2.1.1 Firmware imc DEVICES 2.8R3 SP6 dated May 3rd, 2013 (AddOn 2013-06-27)

COM

Units of fieldbus channels

Units for fieldbus channels can be changed by COM.

ARINC Assistant

A new data format *.idb2 is supported, which also records Parity-Bit and SSM information.

7.2.1.2 Firmware imc DEVICES 2.8R3 SP6 dated May 3rd, 2013 (AddOn 2013-05-16)

Bridge supply

Supply voltage options of 1V and 2.5V for the following amplifiers: UNI-8, UNI2-8, DCB-8, DBC2-8, B-8 in all device types (CRPL, CRC, SPARTAN and CRFX). The necessary prerequisite is custom commissioning or modification by imc. There is no possibility for the user to select a different "setting" in the software.

ISO2-8: Temperature measurement

Pt1000 characteristic curves are supported for ISO2-8. The necessary prerequisite is for the system have received custom commissioning or modification by imc. There is no possibility for the user to select a different "setting" in the software.

CRFX/ISOF-8

The new flex module ISOF-8 has been implemented.

Data format

The data headers for saved channels now contain additional information on

- the software version used,
- the name of the device which captured the data, and
- where the data were captured (device or PC)

imc REMOTE

Access via a imc REMOTE WebServer for devices having serial numbers of 14xxxx or higher.

ARINC Interface

The format *.idb2 has been added. Additionally this format saves Parity-Bit and SSM.

7.2.1.3 Firmware imc DEVICES 2.8R3 SP5 dated February 5th, 2013

Synchronization with NTP

New entry in device properties "*NTP: Interval [s] (min,max)*". The synchronization interval can now be limited in a min and max interval. Shorter intervals provide quicker and more precise synchronization, but they burden the network more severely!

7.2.2 Documentation/Help

The Help information has been updated and its entire design has been revised. Additionally, sections within a chapter can be expanded/collapsed as desired (not available in PDF).

Revisions of the contents include:

- imc STUDIO - General
 - User Administration
 - Installation, product configuration and licensing
 - Command line parameters
 - Navigation pane
- Placeholders
 - Description of the SETUP-placeholder (enables displaying/reading of data belonging to the Setup)
- Setup
 - Explanations of the table descriptions and the complete layout
- Scripting

7.3 imc STUDIO 4.0R1 build November 20, 2012

7.3.1 Firmware and new hardware

7.3.1.1 Firmware imc DEVICES 2.8R3 SP4 dated January 10, 2013

New imc SPARTAN module

The following imc SPARTAN module have been added:

- SPAR/BCF16

7.3.1.2 Firmware imc DEVICES 2.8R3 SP3 dated November 13, 2012

No changes.

7.3.1.3 Firmware imc DEVICES 2.8R3 SP2 dated October 31, 2012

No changes.

7.4 imc STUDIO 4.0R1 build September 20, 2012

7.4.1 Firmware and new hardware

7.4.1.1 Firmware imc DEVICES 2.8R3 SP1 dated August 31, 2012

CRFX/HISO-8

Thermocouple type-C has been added.

CAN-Assistant

DBC-Import

As part of the DBC import process, a channel selection filter has been added.

Firmware

"Minimum Version":

An entry in the device property disable a downgrade to a software version that is not supported by the device. Before delivery the setting of this "Minimum Version" is done.

Device connection

- The connection to the device can now be provided with a password protection by means of the device properties.
- The maximum amount of connections per device has been increased to 4x (serial numbers: >130000) or 3x (SN: 12xxxx) for each imc MONITOR and 3x for each Explorer. All six/seven connections can now exist at once. If the device is to be burdened with very many channels or with a high aggregate sampling rate, it is recommended to keep the amount of connections low. If the device is overloaded, data overflow may occur in consequence.
- WLAN connection with 54 MBit/s with imc CRONOS*compact* and imc CRONOS*flex*

GPS

The GPS channels are now directly available for data acquisition as Fieldbus channels.

imc REMOTE Secure Access

Access via a secured https-access for devices having serial numbers of 14xxxx or higher.

Microsoft Explorer shell extension

Access to the device hard drive is now possible under 64-bit Windows operating system via the Microsoft-Explorer.

CRFX Modules

The following imc CRONOS*flex* modules have been added:

- CRFX/UNI-4
- CRFX/AUDIO2-4

Devices

Support of devices:

- imc CRONOS*flex*-2000G (CRFX-2000G)
- imc CRONOS*compact*-2000G (CRC-2000G)

MVB

The Fieldbus interface MVB Bus is now supported.

IPT COM

The Fieldbus interface IPT COM is now supported.

7.4.2 Project Management

Experiments can be grouped in projects.

The following properties are saved in the projects:

- Experiments
- Experiment templates
- Views
- Variables with the validity range "Project"
- Project-bound events (*as of package: imc STUDIO Professional*)

7.4.3 Ribbon

The Menu Band has been revised as the current Ribbon View.

It is possible to create user-defined buttons.

- User-defined buttons can run selected commands.

7.4.4 imc STUDIO Panel

It is possible to create user-defined color schemes for widgets.

The rights to edit and display individual Panel pages can be linked to user roles. (*As of package:* imc STUDIO Professional)

7.4.4.1 Widgets (formerly: Controls)

Name change: Controls have been redesignated as Widgets

New Widgets (*as of package:* imc STUDIO Professional)

- **Audio**
 - For recording and playback of audio commentary in the [Report channel](#)  (e.g. via headset or microphone)
- **Text input for Report channels**
 - Adding textual commentary on a Report channel
 - Fixed, preset texts
 - Not previously defined texts ("free texts")
 - Composition of mixed variable and fixed portions possible
- **Special Widgets**
 - Horizon
 - Rudder
 - Elevator
 - Wing

Various channel properties can be used in the widgets' properties.

- E.g. Range (the widget's range adjusts itself to the analog channel's input range)
- E.g. Curve window colors (the colors of the channels in the curve window adapt to the colors set for the respective channels)

Changes to widgets:

- Widget: *Input, Output > Text*
 - The scrollbar can be prevented from appearing in order not to block the view of a very long single line of text.

Switch/Pushbutton-widgets can be hidden during printout/export.

7.4.4.2 Navigation Bar

The Navigation bar has been completely revised

Widget coupling

- All widgets can be coupled with the Navigation Bar

Position slider controls in the curve window

- All linked widgets indicated the measured value in accordance with the time point selected (position of the position slider control) (except single value variables)

- The position slider can be moved using the keyboard

Navigation through all tags (entries in the Report channels)

Search and filter for tags (entries in the Report channels)

- In text channels, it is possible to search for entries
- In Audio channels, it is possible to hear the entries again
- It is possible to navigate to tags found in a search

Post-processing

- Report channels can also be edited after concluding the measurement

7.4.5 imc STUDIO Setup

Channel names

- Assistant for generating parameter-dependent channel names
- Optionally, the channel names of the first selected device in the experiment can use the device name as a suffix.

Individual control of devices

- The devices can be controlled separately (Start, Stop, Disconnect, Download, ...)

Parallelization of the device control

- When multiple devices are used, they can be processed in parallel; for example, all the devices can be downloaded in parallel instead of in succession.

Storage of measured data

- The measured data currently available in the Data Browser can be saved by means of a menu action (Save current measurement)
- The storage of measured data can be interrupted or resumed by a menu action.

Connector ID for every device variable

- This enables consistent assignment by means of Import Parameter Set

All triggers can be released by a menu action (Release All Triggers)

24-bit channel resolution for analog channels of the imc CRONOS*flex* devices

Parallel use of different imc DEVICES 2.8+ version

- Thus it is possible to use multiple devices, working with different firmware versions, in parallel, as long as all versions are installed on the same computer.

IF-Config

- IF-Config can be called via the menu, in order to perform device interface settings.

Device descriptions (UMI)

- Device descriptions can be exported and imported

Import/Export parameter set

- Adjustment values can be exported and imported
- Language-independent parameter sets
 - Parameter sets created in different languages can be imported

Integration of the Application Board

Progress indicator windows have been enhanced to accommodate the use of multiple devices.

- Showing up to 10 devices

Complete layouts can easily be added by means of the tabs' context menu.

Table- and column descriptions can be imported and exported (by means of menu item "Project" > "Import/Export")

- Thus, individual columns can be imported from one table description to another one.

When importing supplemental files, it is possible to select for which device this supplemental file is to be imported.

- For this purpose, it is necessary that, for instance, for Messenger files, the files must always be named dev001.msg.
- Distinguishing devices by their number is no longer necessary.

7.4.5.1 Tool window: Sensors

The tool window Sensors has been completely revised.

User-defined characteristic curves can be imported.

Filters from imc SENSORS can be imported

7.4.6 Data Browser

Management of measurements

- Saved measurements can be post-processed (Checkin and Checkout)
- Measurements can be renamed
- Saved metadata on the measurements can be displayed in the Data Browser

System- and device variables

- For Device Resources, these variables are available
 - Device hard drive capacity and space
 - Device- and system time

7.4.6.1 User-defined variables

Variable types distinguished:

- Numeric, Text, Data Table, Channel, Report Channel

Variables storage

- User-defined variables (Channel and Report Channel) can be saved with the measurement just like measurement channels, and along with all familiar measurement channel parameters (e.g. circular buffer duration)

Validity range

- Variables can be coupled to various Validity ranges
- For example, they can be saved with the experiment and later loaded again

Other new features:

- Unit
- Comment
- Initial Value

Variable type: Report Channels

- With Report Channels, the measurement can be supplied with a comment
- Report Channels can be filled with either textual or audio commentary
- Report Channels can be edited later (deletion or addition of entries)
- Additionally, an info can be associated to a text entry, about to which variable or to what measurement channel this entry is assigned.

Variables are no longer created automatically if a command (e.g. the command: Set Variable) attempts to write to a variable which does not yet exist.

- All variables must already exist at the time the system writes to them.
- To ensure compatibility to earlier versions, the process of converting experiments from the version 3.0R4 includes creation of user-defined variables which may have been created by commands otherwise. (Please check the variable type).
- These variables are saved with the experiment.
- Variables which were created using, for instance, the command Import Parameter Set, are not automatically created in the conversion process. When updating the experiment, you should previously (still using imc STUDIO 3.0R4) run Export Parameter Set to export a set in the format *.dat, which contains all user-defined variables. Using imc STUDIO 4.0R1, load the experiment and next load the missing variables with "Load Variable". Then the experiment will operate as accustomed. Next, select all variables loaded, open the context menu and select: "Edit selected variables". Set the property Validity Range to an appropriate range, e.g. "Experiment".

In the global options, it is possible to specify a prefix to the variable name reflecting the Validity Range, in order to avoid duplicate names.

7.4.7 Metadata

Metadata on the experiment can be saved with it.

The saving of metadata on the current measurement can be automated by means of an Assistant (Metadata-Export)

- Setup pages can be displayed before and/or after the measurement.
- The pages desired are saved as metadata on the measurement.
- Channel configurations of the Setup-page can be included in the saved measurement data file.

External metadata (e.g. PDFs or graphics) can be saved in the experiment, or be accessed by means of a reference to them.

Metadata can be viewed in the Data Browser and in the project management.

7.4.8 Tracing settings

The respective settings for saved measurements (complete imc STUDIO experiment) can be saved for later recovery.

7.4.9 imc STUDIO Script

(As of package: imc STUDIO Developer)

Implementation of user-made scripts in conjunction with various imc STUDIO functions

Access is possible to the following functions via the script:

- Objects belonging to imc STUDIO
- Data pool (all variables)
- imc FAMOS - Mathematics
- imc SETUP (Device Settings/Device Control)
- Panel-pages and widgets
- Entire operating system via .NET - API

7.4.10 imc STUDIO Sequencer

(As of package: imc STUDIO Professional)

New, user-defined events:

- Timer Events which are triggered at defined intervals
- Monitoring of variable values has been enhanced with range monitoring and threshold value monitoring
- Trigger monitoring has been extended to: "Trigger released", "Trigger concluded" and "Trigger changed".

7.4.11 Commands

New commands:

- Set Measurement number
 - Symbolic measurement numbers in the Data Browser can be set automatically.
- SQL command
 - Communication with a relational database. Data can be imported and exported, for example.
- Playback [Audio Channel](#) ²⁷²
- Record [Audio Channel](#) ²⁷²
- Run Managed DLL Method
- Run Unmanaged DLL Method
- Run [Script](#) ²⁷³
- Connect and transfer settings
 - Using this command, it is possible to select an action to be run if connection with the device fails. For instance, the configuration can be transferred to a different device and the measurement can be started with that configuration.
- Execute device action
 - Performs a Setup-page action. E.g. balancing of selected bridge amplifiers
- Measure a user-defined characteristic curve
- Import of MFB configurations
 - For import of Fieldbus configurations
- Delete Panel-Page
- Variable Export
 - Exports an existing variable as a .dat-file
- Variable Import
 - Imports variables from .dat-files to an existing variable
- Variable Load
 - Creates variables out of .dat-files. These variables must not already exist.
- Variable Delete
 - Deletes an existing variable

Revised commands:

- Commands are no longer able to create variables (for details, see the description under [User-Defined Variables](#) ²⁷²) (exception: Variable Load)
- Parametersatz import and export
 - The handling of Parameterset commands has been revised. For the purpose of exporting and importing, there are now "Variables"-commands. The Parameterset commands are responsible for setting properties. In consequence, it is only possible to create and import .csv files by means of the Parameterset commands. When converting an experiment, a message in the logbook provides notification of this fact. Please use the appropriate commands:

- for variables: The Variables commands
 - for settings (e.g. channel settings): The Parameterset commands
- Format Converter
 - Selected files can be grouped into a multi-channel file (as imc FAMOS saves all channels)
 - Optionally, the source data can be deleted following successful data saving
- Run Menu Action
 - Existing actions have been enhanced

Entries in the tool window *Commands* have been restructured (Sorting/Structure)

When starting or stopping the measurement, additional commands can be run (by means of metadata-export)
(As of *package*: imc STUDIO Developer)

7.4.12 User Administration

(As of *package*: imc STUDIO Professional)

The active user is able to log out.

The User Administration can be activated or deactivated.

Three different user types are differentiated:

- Project-based users
 - Users can be set up for a specific project. These users exist only in imc STUDIO and are not Windows accounts.
- Domain account
- Computer account

It is possible to prevent logging in of anonymous users.

It is possible to specify minimum lengths for users names and passwords.

7.4.13 imc STUDIO Monitor

Device single value variables such as Display variables can be read and written.

7.4.14 Placeholders

There is a new placeholder (<SETUP.SQL>) enabling access via SQL to settings belonging to the Setup. This placeholder can be used in the Panel and in selected commands. For the purpose of using this placeholder, an Assistant is available, which automatically opens once the placeholder has been entered.

7.4.15 Runtime functionality

using imc STUDIO Standard it is possible to run experiments which use components of the Professional and Developer packages. The portions requiring licensing can only be run but not edited. The following components can not be run:

- imc STUDIO Video

7.4.16 Miscellaneous

Error windows have been integrated into the log book.

The About dialog has been revised.

The Product Configurator has been revised

A central Options dialog has been introduced.

The GUI has been upgraded to .NET4.

Product-Setup (on DVD)

- The DVD has been expanded with additional imc products.

Device overview

Some of the capabilities discussed in this document only pertain to certain device models. The associated device groups are indicated at the respective locations. The groups are shown in the following table which can be used with imc STUDIO.

— not available
CRXT imc CRONOS-XT

● standard
CRFX imc CRONOSflex

○ optional
CRC imc CRONOScompact

imc device	SPARTAN	BUSDAQ	BUSLOGflex	BUSDAQflex	SPARTAN-R SPARTAN-N	CRSL-N CRC-400	C1-N C-SERIE-N	C1-FD C-SERIE-FD	CRFX-400	CRFX-2000	CRC-2000G	CRC-400GP	CRFX-2000G	CRFX-2000GP	CRXT	EOS	ARGUSfit BASE
Driver package	imc DEVICES															imc DEVICEcore	
Firmware group	A															B	
Device group	A4				A5					A6	A7					B10	B11
Device series number range ¹	13zzzz				14zzzz					16zzzz	19zzzz					4120zzz	4160zzz
TCP/IP Interface [MBit/s]	100				100					100	1000					1000	1000
Sampl.Rate ² [kHz]	400				400					2000 / 400 ³	2000 / 400 ³	2000 / 400 ³	2000	2000	2000	4000	5000
STUDIO Monitor supported	●				●					●	●					—	—
Connections ⁴	4				4					4	4					—	—
Signal processing in the device																	
Online FAMOS	○	○	—	○	○	●	●	●	●	●	●					—	●
Preprocessing original channel	●	—	—	—	●	●	●	●	—	●	●	●	—	—	—	—	—
Preprocessing monitor channel	●	—	—	—	●	●	●	●	—	●	●	●	—	—	—	—	●
Data Storage																	
CF	●				●					—	—					—	—
Express Card	—				—					●	—					—	—
CFast	—				—					—	●					—	—
USB	—				—					●	●	●	●	●	—	—	—
microSD	—				—					—	—					—	●
Storage on network drive	●				●					●	●					—	—
Internal hard disk	○	(○) ⁵	—	—	○	○	—	—	○	○	○					●	—
Synchronization																	
DCF	●				●					●	●					—	—
IRIG-B	—	—	●	●	●					●	●					●	●
GPS	●	●	—	(●) ⁶	●					●	●					—	●
NTP	—	—	●	●	●					●	●					●	●
PTP	—				—					—	—	●	—	●	●	—	—
Phase offset correction	—	—	●	●	●					●	●					●	●

1 The digits shown indicate the device group. The variable portion of the device serial number is represented by "zzzz" or "zzz".

2 Max. aggregate sampling rate (see data sheet)

3 2000 via EtherCAT else 400

4 Number of imc STUDIO Monitor-connections or imc REMOTE (as of 14xxxx) connections

5 not available for imc BUSDAQ-2

6 not available for imc BUSDAQflex-2-S



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imc ACADEMY - Training center

The safe handling of measurement devices requires a good knowledge of the system. At our training center, experienced specialists are here to share their knowledge.

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