



An Axiometrix Solutions Brand

# imc STUDIO Monitor 2024

What is new

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## 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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## Open Source Software Licenses

Some components of imc products use software which is licensed under the GNU General Public License (GPL). Details are available in the About dialog.

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 Monitor (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 Monitor (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 DEVICES as a driver package for imc STUDIO Monitor

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

- imc DEVICES: For devices belonging to the [firmware group A](#)<sup>34</sup> - e.g. CRONOS family, C-SERIES, SPARTAN, BUSDAQ

Configuration of the devices, as well as starting of the measurement are accomplished by means of the separate device software program imc STUDIO or imc WAVE. The driver and firmware component in imc STUDIO Monitor is exclusively for configuring the monitoring of the devices.

# Introduction

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



Please do not use any experiments which had been created in Version 5.2.

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Due to the new developments implemented in imc STUDIO Monitor, it is not possible to transfer old experiments into it. Please select a different device. However, it is possible to reuse Panel pages from older experiments.

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

# imc STUDIO Monitor 2024 R1

## 1 Firmware

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

- Firmware imc DEVICES 2.17 R1

## 2 Miscellaneous optimization

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

Area	Description
Device control	<ul style="list-style-type: none"> <li>• Improvements in the 4K display The combined columns in the device configuration tables (Setup) are now displayed correctly. Previously, the columns overlapped.</li> </ul>
Data Browser	<p>The expansion behavior in the Data Browser has been improved so that access to the variables is possible in most cases without many actions.</p> <ul style="list-style-type: none"> <li>• "Analog channels" in "Current Measurement" is expanded from the start.</li> <li>• When searching by name, everything that contains the search result is automatically expanded.</li> </ul>
Metadata	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Drop-down list in Data Browser for metadata columns offers new channel metadata directly. Previously, a restart was required.</li> </ul>
Transfer to imc FAMOS	During the transfer to imc FAMOS of time-stamped data, there was a crash of imc STUDIO Monitor.
Python command	<p>The error behavior has been improved.</p> <ul style="list-style-type: none"> <li>• If "<i>imcVariables</i>" is specified as an input or output variable, the command returns an error and aborts.</li> <li>• 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.</li> <li>• If a variable cannot be transferred to Python or from Python to imc STUDIO Monitor, the variable name is also displayed in the error message.</li> </ul>
Project management	The export of experiments and projects larger than 2 GB was not working properly.
Licensing	imc STUDIO Monitor occupied a imc API network license in some cases.
Installation medium	<p>The installation medium now contains imc FAMOS 2024 R1* and the corresponding curve manager (imc Shared Components).</p> <p>*must be purchased and licensed separately for the PC</p>

## Additional missing components and functions belonging to Version 5.2



### 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.
- Panel: Navigation Bar

# Archive

## 1 imc STUDIO Monitor 2023

### 1.1 Introduction

The imc STUDIO Monitor 2023 you now possess is a version which is updated to the newest level of PC technology. This version of imc STUDIO Monitor is designed for 64-bit computer architecture. For this purpose, many key components have been updated, revised or even redesigned from scratch. The outcome is a modernized system architecture which provides substantial improvement of performance. To mention a few points up front:

- imc STUDIO Monitor is now a multi-threading capable 64-bit version,
- the display in the curve window is substantially more powerful and smooth.



#### Note

Please do not use any experiments which had been created in Version 5.2.

Due to the new developments implemented in imc STUDIO Monitor, it is not possible to transfer old experiments into it. Please select a different device. However, it is possible to reuse Panel pages from older experiments.

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 Monitor.

### 1.2 imc STUDIO Monitor 2023 R6

#### 1.2.1 Firmware

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

- Firmware imc DEVICES 2.16 R6

#### 1.2.2 Metadata



##### 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.



### 1.2.3 Exporting variables



#### Uniform export templates (\*.aet) with imc FAMOS

The export templates of imc FAMOS and imc STUDIO (imc STUDIO Monitor) 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 Monitor	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) 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 Monitor. 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.

## 1.2.4 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.
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.

## 1.3 imc STUDIO Monitor 2023 R5

### 1.3.1 Firmware

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

- Firmware imc DEVICES 2.16 R5

### 1.3.2 Monitor



#### Transfer channels selectively

Transfer of the channels to imc STUDIO Monitor can be activated on a per-channel basis. Thus it is possible to view individual channels without overburdening the network with all the channels.

For this purpose, imc STUDIO Monitor uses the channel-parameter: "Transfer to PC".

Name	Current value	Transfer to PC	Save (PC)
▼ Channel type: Analog inputs (Count=8)			
Channel_001	1014.2 mV	<input type="checkbox"/>	
▶ Channel_002	-26.552 mV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Channel_003	1.3734 mV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Channel_004	10.834 mV	<input type="checkbox"/>	
Channel_005	4.8831 mV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Channel_006	3.9675 mV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Channel_007	9.1558 mV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Channel_008	-2.8993 mV	<input type="checkbox"/>	

Transfer to PC

In the example, channel\_001 is not transferred while channel\_002 records measurement data.

Note: Single value variables are always transferred.

### 1.3.3 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.

### 1.3.4 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*".

### 1.3.5 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.

### 1.3.6 Miscellaneous optimization

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

Area	Description
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 Inline FAMOS	<p>Function "<i>StDev</i>"</p> <ul style="list-style-type: none"> <li>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.</li> </ul>
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.
Widgets	<p>Graphical switch</p> <ul style="list-style-type: none"> <li>The graphical switch caused permanent burdening of the CPU.</li> <li>The option "<i>Zoom factor</i>" in the Widget "Graphical switch" was interpreted incorrectly in some regional formats. "0.7" was interpreted as "7".</li> </ul> <p>Table</p> <ul style="list-style-type: none"> <li>Any table on a page which is not open was not displayed upon export of a multi-page PDF-file.</li> </ul> <p>Standard &gt; Switch (Checkbox)</p> <ul style="list-style-type: none"> <li>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.</li> </ul>
Ribbon	The buttons " <i>Connect</i> " and " <i>Disconnect</i> " have been removed from the menu ribbon since they had no useful function in the context of monitoring.
Starter-exe	<p>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.</p> <p>Info on compatibility: Start the imc STUDIO Monitor by a shortcut or via the command line, correct the path to the exe-file if appropriate.</p> <ul style="list-style-type: none"> <li>old: "C:\ProgramData\imc\imc STUDIO\Applications\_1\imc STUDIO Monitor.exe" "imcDB://DB_Monitor\StandardProject\MyExperiment"</li> <li>new: "C:\Program Files\imc\imc STUDIO 2023\imc.Monitor.exe" "imcDB://DB_Monitor\StandardProject\MyExperiment"</li> </ul>
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.

Area	Description
Installation	<p>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.</p> <p>As of 2023 R5, any older versions are once again recognized and uninstalled correctly.</p> <p>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".</p> <p>This will not cause any loss of functionality.</p> <p>Please contact our Technical Support team if you wish to completely remove the version. Attach the following number: IT041604 to your service request.</p>

## 1.4 imc STUDIO Monitor 2023 R4

### 1.4.1 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.

#### Speedup of first imc FAMOS-command call

Previously, the first run of an imc FAMOS-command after having started imc STUDIO Monitor 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 Monitor as a consequence. Thus the start occurs at a point in time at which no imc FAMOS analysis is running.

### 1.4.2 Firmware

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

- Firmware imc DEVICES 2.16 R4

## 1.4.3 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.

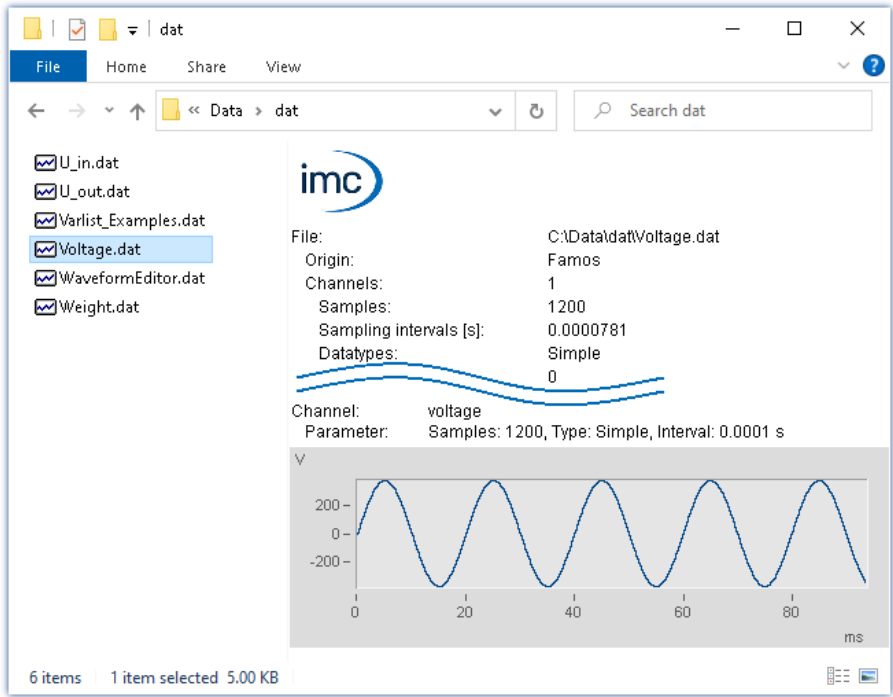
### 1.4.4 Explorer-Preview



#### 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 Monitor also enables this function.



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

### 1.4.5 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.
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.
Curve window	The color map setting for "Interpolation, cubic polynomial" caused a crash when a vector was displayed.



Area	Description
Logbook	<p>Copying entries, including supplemental information</p> <p>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.</p> <p>Additionally, the text resulting from normal copying has been slightly adapted.</p>
Translation	Numerous texts have been translated into Japanese.

## 1.5 imc STUDIO Monitor 2023 R3

### 1.5.1 General Changes in imc STUDIO Monitor



#### Separate database with unique views

The relevant menu items and configuration columns differ strongly from imc STUDIO. For this reason, the default database path for imc STUDIO Monitor has been modified:

C:\Users\Public\Documents\DB\_Monitor

By this means, views and projects can be created which don't affect any parallel installed versions of imc STUDIO.

Due to the separate database, the views can be changed in a way which makes only the relevant menu items in the menu ribbon visible. Additionally, the channel tables on the Setup pages have been revised.

**Notes on compatibility:** If you have already used imc STUDIO Monitor 2023 R2, the database is not relocated automatically. We recommend manually modifying the database path via the Options.



#### Saving measured data

The channels' measured data can now be saved.

Data saving can be performed either continually during running measurement, or after the measurement by means of the corresponding menu item, as already familiar from imc STUDIO.

### 1.5.2 Firmware

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

- Firmware imc DEVICES 2.16 R3

### 1.5.3 Miscellaneous optimization

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

Area	Description
Setup	<ul style="list-style-type: none"> <li>• The channel types: DOut_Bit and DIn_Bit were not transferred correctly and always contained the value "0".</li> <li>• Any changes to the parameter "<i>Circular buffer duration</i>" did not take effect. The channel's default setting was always applied, no matter what duration the user set.</li> </ul>
Setup - Default values	It had not been not possible to set the parameter for a default value. Instead, an error was reported.
Inline Analysis	<ul style="list-style-type: none"> <li>• Monitor channels can now be used as the input channels of calculations.</li> </ul>

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Area	Description
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.
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.

## 1.6 imc STUDIO Monitor 2023

This is the first version of imc STUDIO Monitor 2023. 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.

## Stand-alone imc STUDIO Monitor installation and license

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.

Below is an overview of the installation variants and the respective licenses required:

Installation variety	Required licenses	Description
imc STUDIO	One imc STUDIO Edition	imc STUDIO allows <b>configuring of measurement devices, performance of measurements</b> , and monitoring of instantaneous readings. Data can be viewed and edited live at one work station.
imc STUDIO Monitor	imc STUDIO Monitor	imc STUDIO Monitor makes it possible to <b>connect with one or more measurement devices during a running measurement</b> , particularly for the purpose of monitoring the instantaneous readings. Data can be viewed and edited live on multiple workstations.
imc WAVE	imc WAVE Analyzer license	imc WAVE is a software package for <b>NVH analysis</b> (Noise Vibration and Harshness). It can be equipped with multiple, separately licensed analyzers. The software enables the user to perform measurements, evaluations, data visualization, and to compose reports specifically for acoustic tests.

## Available plug-ins/components

Due to the conversion to a separate product, the composition of the components has been modified. In Version 5.2, the Monitor-component could be combined with all editions of imc STUDIO. This is now no longer possible, so that some functions such as Scripting or Sequencer are not available. Conversely, there are now additional components available, which had not been available in combination with imc STUDIO Standard, such as the advanced Widgets.

Below is a table correlating plug-ins and their functions.

Available plug-ins/components	Description	
	● : included      ○ : optional	
imc STUDIO Monitor	Framework of the multi-client monitoring	●
	User administration: Access control, roles and rights management	●
Setup	Device driver and interface for monitoring of imc devices	●
Panel	Display of measurement data	●
Widgets: Standard	Gauges and control elements (basic selection)	●
Widgets: Automotive, Industrial, Designer, Aviation	Extended selection and styles	●
Project Management	Projects and Experiment templates	●
Data Processing	User interface for configuring mathematics functions Interface for processing of data streams	●
imc Inline FAMOS	Real-time analysis on data streams (PC based platform and license)	○
Inline Analysis	imc WAVE: NVH analysis on data streams (PC based platform and license)	○
Bus Decoder	Extension package for decoding of fieldbus log channels	●
Powertrain Monitoring	Extension package for monitoring powertrains	○

For more information on the individual components, see the technical data sheet for imc STUDIO Monitor.

## 1.6.1 General Changes in imc STUDIO Monitor



### 64 Bit

imc STUDIO Monitor 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 Monitor 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 10/11 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.

### Project management

imc STUDIO Monitor organizes the experiments in a database and in projects, as is familiar from imc STUDIO. It is possible to create multiple projects into which the individual experiments can be sorted.



### Accessible introduction via the homepage

It is now possible to obtain the manuals for the system directly from the homepage. As well, the manuals for the hardware and other imc-products are available directly on the homepage.



### 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. 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.

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

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 Monitor applies this setting. We continue to recommend saving the measured data in the imc3 format.

## 1.6.2 Firmware and new hardware

### imc DEVICES as a driver package for imc STUDIO Monitor

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

- imc DEVICES: For devices belonging to the [firmware group A](#)<sup>34</sup> - e.g. CRONOS family, C-SERIES, SPARTAN, BUSDAQ

Configuration of the devices, as well as starting of the measurement are accomplished by means of the separate device software program imc STUDIO or imc WAVE. The driver and firmware component in imc STUDIO Monitor is exclusively for configuring the monitoring of the devices.

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

- Firmware imc DEVICES 2.16 R2



#### 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.

### 1.6.3 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: " <i>Automat...</i> "	1.2131 mV	1.2 mV
For the factor: " <i>micro</i> "	1213.1 $\mu$ V	1200 $\mu$ V

- 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.



### "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



### 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 - Miscellaneous

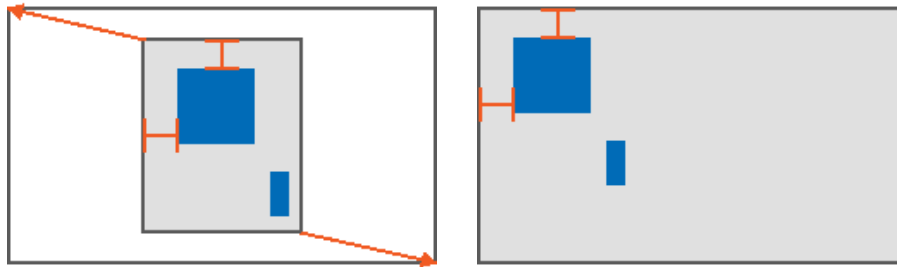
The following functions are no longer supported:

- "*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.



The sizes of the individual Widgets thus remain intact.

Result



### Discontinued: "Audio-Widget"

The following Widget is no longer supported: "Audio-Widget". It was only needed for the channel type "[Audio-Report channel](#)<sup>28</sup>" 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.



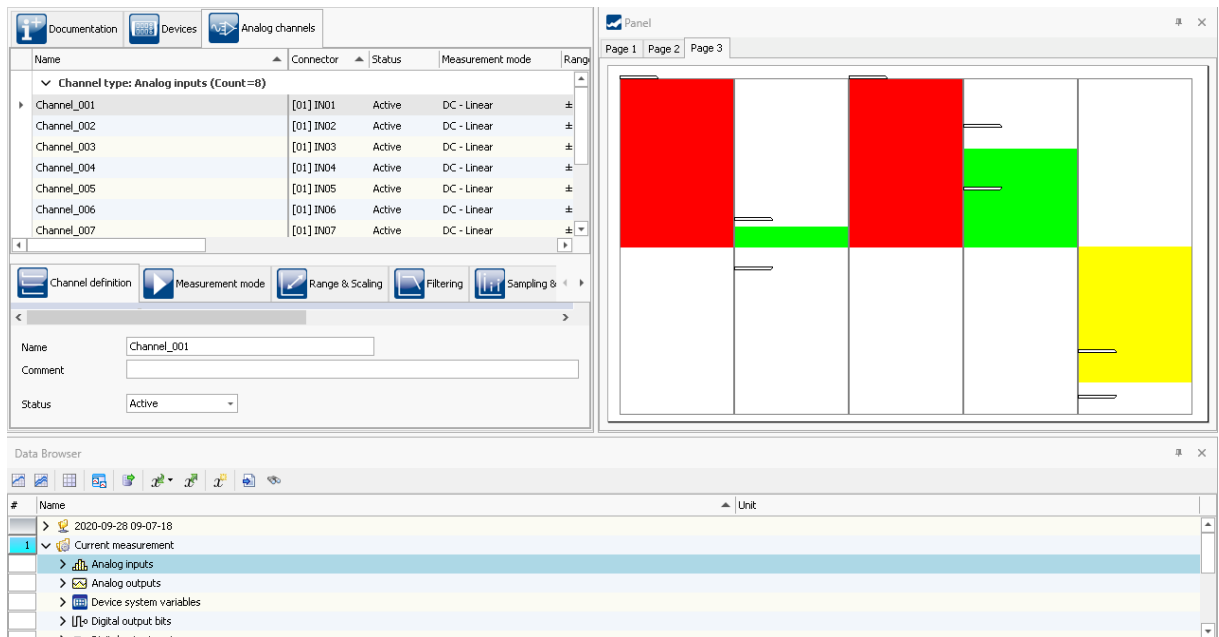
## 1.6.4 Style

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 show the Panel in the Setup.

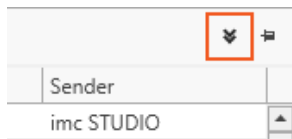


Example: Panel and Data Browser are displayed together in the main window "Setup".



### 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.

## 1.6.5 imc Inline FAMOS



### Cross-device calculations

imc Inline FAMOS under imc STUDIO Monitor now provides the ability to apply calculation operations to channels belonging to different devices, if the channels are assigned to "BaseTrigger" (measurement Start/Stop).

## 1.6.6 Inline Analysis - imc WAVE

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

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.

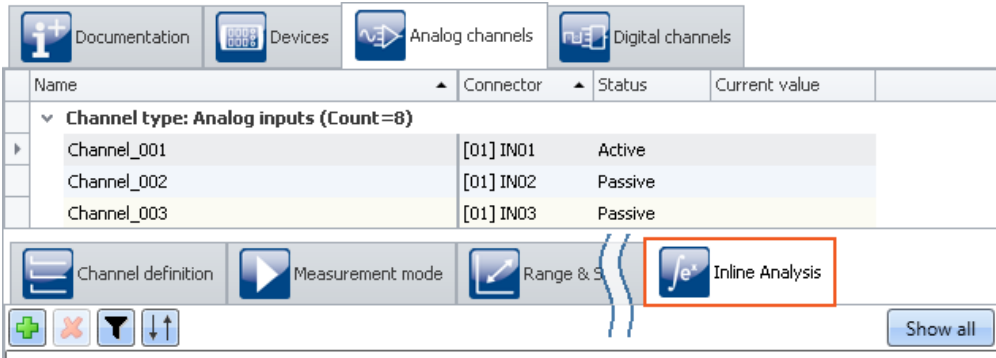
With the corresponding license, you are able to activate the following analyzers:

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. <ul style="list-style-type: none"> <li>• Sound level meter Standard IEC 61672-1</li> <li>• 1/3- and 1/1-octave analysis as 3D or averaged Standard IEC 61260-1</li> <li>• FFT analysis as 3D or averaged</li> <li>• Determining the sound intensity (time plot, narrow band spectrum and 1/3-octave spectrum) for measurements with an intensity probe</li> </ul>
imc WAVE Rotation	Functions for analysis of rotating machinery <ul style="list-style-type: none"> <li>• Resampling of time-domain channels</li> <li>• Order-tracking analysis as a 3D or averaged</li> <li>• FFT analysis as a 3D or averaged</li> <li>• Calculation of an input signal over time to a channel over RPMs (RPM-presentation)</li> <li>• Calculation of spectrum over time or revolutions, to a 3D-channel over RPMs (RPM-vector-presentation)</li> <li>• Calculation of 3D cross sections</li> </ul>
imc WAVE Vibration	Functions for vibration analysis of human vibration and machine diagnostics <ul style="list-style-type: none"> <li>• Filters (LP, HP, BP, BS, simple/double integration, simple/double differentiation, envelope curve)</li> <li>• Machine diagnostics standard ISO 10816 and ISO 20816</li> <li>• Human vibration filters standard ISO 2631-1, ISO 8041, DIN EN 12299</li> <li>• 1/3- and 1/1-octave analysis of vibration as 3D or averaged Standard IEC 61260-1</li> <li>• FFT analysis as 3D or averaged</li> </ul>
imc WAVE Structure	Functions for 2-channel analysis in the frequency domain <ul style="list-style-type: none"> <li>• Generation of output signals for the purpose of subsequent modal analysis</li> <li>• Calculation of transfer functions with noisy input- and/or output signals</li> <li>• Calculation of the coherence as a quality indicator</li> <li>• Power rating by means of the cross-power-spectrum and spectral power density</li> <li>• FFT analysis as 3D or averaged</li> </ul>

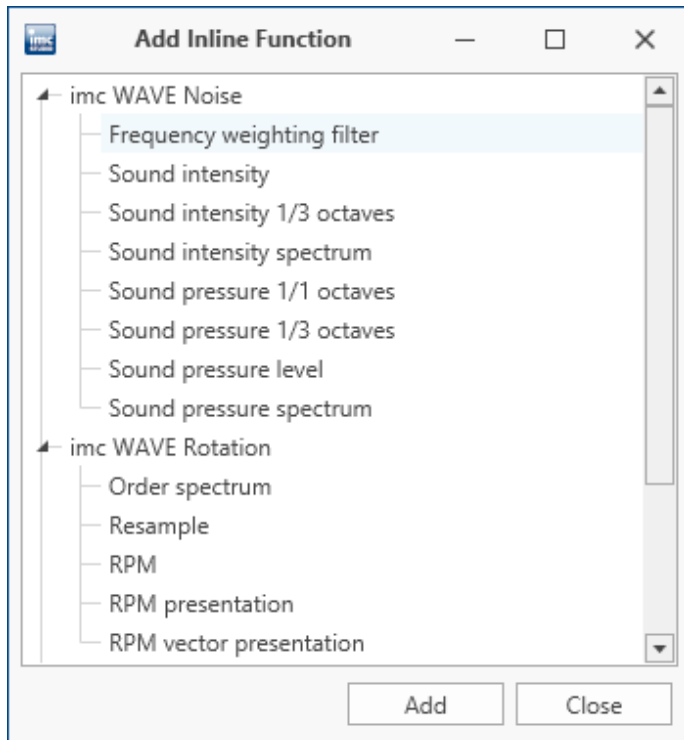
Using the "Inline Analysis"-dialog, you can calculate/derive additional channels from a measured channel.

**Setup page:** Analog channels

**Dialog:** Inline Analysis



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



*Adding a new Inline Functions*

### 1.6.7 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.



## 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](#)<sup>[32]</sup>.

## 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](#)<sup>[24]</sup> and the [Audio-commands](#)<sup>[32]</sup> 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.

## 1.6.8 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.



### 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*".

## 1.6.9 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 Monitor, 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.

To imc FAMOS			From imc FAMOS			Options		
Transfer variable from imc FAMOS								
Storage location (only for saved results):								
Last completed measurement ( LastMeasurement )								
	imc STUDIO variable		imc FAMOS variable		Save			
	Res1	▼	Res1		<input checked="" type="checkbox"/>			
	Res2	▼	Res2		<input type="checkbox"/>			

*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 Monitor, 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.



## 1.7 Update-notes and compatibility from 5.2 to 2023

If you plan to update from Version 5.2 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
Discontinued devices	<ul style="list-style-type: none"> <li>• <a href="#">Devices</a><sup>[21]</sup> belonging to groups 2 and 3</li> <li>• imc HiL</li> </ul>
Variables	<ul style="list-style-type: none"> <li>• Category processing - "<a href="#">No category</a><sup>[28]</sup>" no longer exists</li> <li>• User-defined variables: The types "<a href="#">Channel</a><sup>[28]</sup>", "<a href="#">Audio-Report channel</a><sup>[28]</sup>" and "<a href="#">Data table</a><sup>[28]</sup>" are no longer supported.</li> <li>• <a href="#">Export Variable</a><sup>[30]</sup>: The csv-format is no longer supported for variables.</li> <li>• <a href="#">Export parameter set</a><sup>[30]</sup>: The XML format is no longer supported.</li> <li>• <a href="#">Export parameter set</a><sup>[30]</sup>: User-defined text-variables can not be exported as a parameter set.</li> </ul>
Data Browser	<ul style="list-style-type: none"> <li>• "<a href="#">Filter list</a><sup>[23]</sup>" has been eliminated</li> <li>• "<a href="#">Navigation mode</a><sup>[23]</sup>" has been eliminated</li> <li>• "<a href="#">Shows comparison measurement</a><sup>[23]</sup>" has been eliminated</li> </ul>
Widget	<ul style="list-style-type: none"> <li>• The "<a href="#">Audio-Widget</a><sup>[24]</sup>" are no longer supported</li> </ul>
<a href="#">Widget - Table</a> <sup>[22]</sup>	<ul style="list-style-type: none"> <li>• Interplay between settings for "<a href="#">Factor</a>" and "<a href="#">Decimal places</a>" has been changed.</li> <li>• Decimal place count: "<a href="#">auto</a>" no longer equates to "1".</li> </ul>
Commands	<ul style="list-style-type: none"> <li>• It is no longer possible to delete a variable using the <a href="#">Kommando "Variable setzen"</a><sup>[31]</sup>.</li> <li>• Discontinued: "<a href="#">SQL-command</a><sup>[32]</sup>"</li> <li>• The commands: "<a href="#">Playback audio channel</a><sup>[32]</sup>" and "<a href="#">Record audio channel</a><sup>[32]</sup>" are no longer supported</li> <li>• The command "<a href="#">Run imc FAMOS sequence</a><sup>[31]</sup>" - Channel return values can no longer be transferred back to a "<a href="#">User-defined variable</a>" of the type "<a href="#">Numeric</a>" (Single value).</li> <li>• The command "<a href="#">Run imc FAMOS sequence</a><sup>[31]</sup>" - This command only saves data in dat-format now.</li> </ul>
imc STUDIO PowerQuality	imc STUDIO PowerQuality is no longer supported

# 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 Monitor.

— 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	CI-N C-SERIE-N	CI-FD C-SERIE-FD	CRFX-400	CRFX-2000	CRC-2000G	CRC-400GP	CRFX-2000G	CRFX-2000GP	CRXT
Driver package	imc DEVICES														
Firmware group	A														
Device group	A4				A5				A6	A7					
SN <sup>1</sup>	13				14				16	19					
TCP/IP Interface [MBit/s]	100				100				100	1000					
Sampl.Rate <sup>2</sup> [kHz]	400				400				2000 / 400 <sup>3</sup>	2000 / 400 <sup>3</sup>	2000 / 400 <sup>3</sup>	2000	2000	2000	
STUDIO Monitor supported	●				●				●	●					
Connections <sup>4</sup>	4				4				4	4					
<b>Signal processing in the device</b>															
Online FAMOS	○	○	—	○	○	●	●	●	●	●				●	
Preprocessing original channel	●	—	—	—	●	●	●	●	—	●	●	●	—	—	—
Preprocessing monitor channel	●	—	—	—	●	●	●	●	—	●	●	●	—	—	—
<b>Data Storage</b>															
CF	●				●				—	—					
Express Card	—				—				●	—					
CFast	—				—				—	●					
USB	—				—				●	●	●	●	●	●	—
microSD	—				—				—	—					
Storage on network drive	●				●				●	●					
Internal hard disk	○	(○) <sup>5</sup>	—	—	○	○	—	—	○	○				○	
<b>Synchronization</b>															
DCF	●				●				●	●					
IRIG-B	—	—	●	●	●				●	●					
GPS	●	●	—	(●) <sup>6</sup>	●				●	●					
NTP	—	—	●	●	●				●	●					
PTP	—				—				—	—	—	●	—	●	●
Phase offset correction	—	—	●	●	●				●	●					

1 Extend serial number range by four digits (three for imc EOS)  
 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



An Axiometrix Solutions Brand

## Contact imc

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If you have problems or questions, please contact our tech support:

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E-Mail: [hotline@imc-tm.de](mailto:hotline@imc-tm.de)

Internet: <https://www.imc-tm.com/service-training/>

### 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.

E-Mail: [schulung@imc-tm.de](mailto:schulung@imc-tm.de)

Internet: <https://www.imc-tm.com/service-training/imc-academy>

### International partners

You will find the contact person responsible for you in our overview list of imc partners:

Internet: <https://www.imc-tm.com/imc-worldwide/>

### imc @ Social Media

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