imc STUDIO 5.0

What is new

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Foreword

Thank you for deciding to purchase our product. We wish you total success in accomplishing your measurement assignments with the help of your hardware and software. If you have any open questions about our products, please contact our Hotline (hotline@imc-berlin.de).

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 gratefully accept any suggestions for improvements, please contact our Hotline (hotline@imc-berlin.de).

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

Copyright

imc Software and Microsoft® Windows

imc software runs on the Microsoft® Windows operating system.

GPL Sources

Some components of our hardware use software, that is licensed under GNU General Public License (GPL). A description can be found at the imc STUDIO setup DVD in folder "*Products\imc DEVICES\OSS*".

Update

Along with the PC software (imc STUDIO), the software comprises components such as device drivers and firmware (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 the imc Hotline or the imc website.

Download links:	
imc STUDIO	http://www.imc-berlin.com/download-center/product-downloads/imc-studio/software/
imc DEVICES	http://www.imc-berlin.com/download-center/product-downloads/imc-devices/software/

imc STUDIO Version 5.0R13

1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1 Firmware 2.9R10

In this version, certain issues have been resolved.

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.

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. "± -770000 µeps" is now omitted. Now, the readout is correctly "± 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.

imc STUDIO Version 5.0R12

1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1 Firmware 2.9R9

Field-bus

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 imc Customer Service.

Hardware

HRENC-4

Mode Angle absolute: The zero pulse is now evaluated for each revolution.

2 General Changes in imc STUDIO

In this version, certain issues have been resolved.

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.

imc STUDIO Version 5.0R11

1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1 Firmware 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)

2 General Changes in imc STUDIO

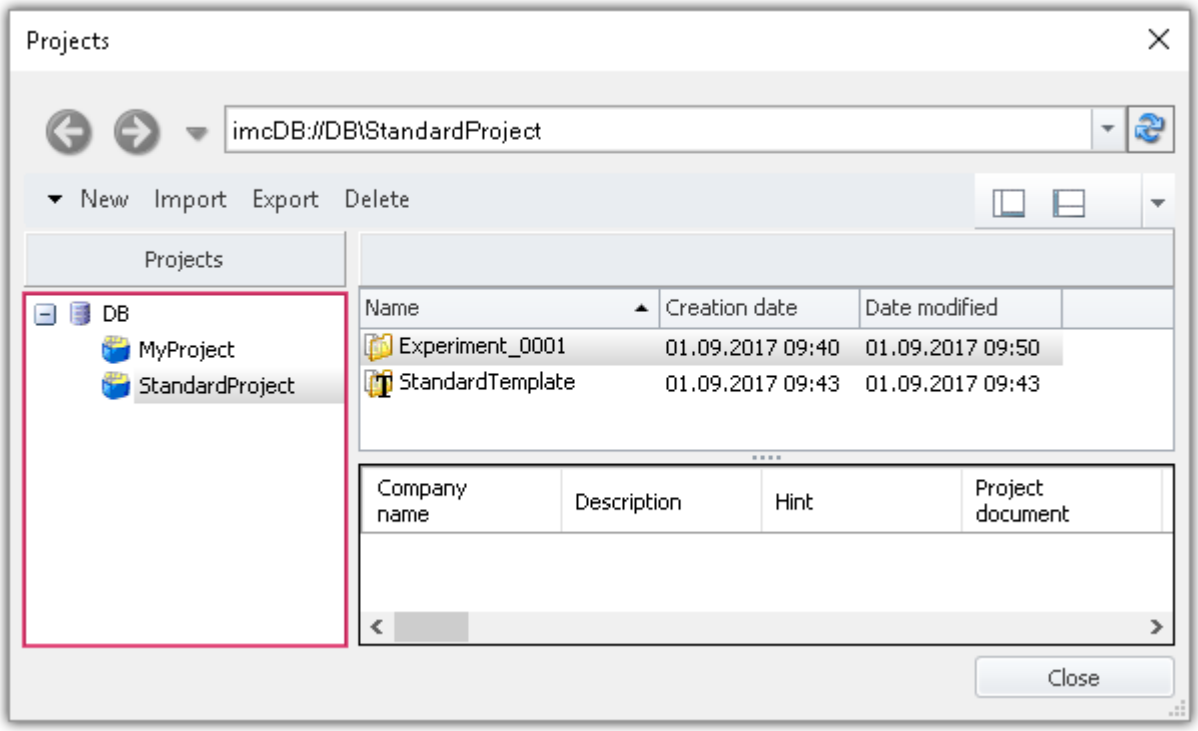
In this version of imc STUDIO, certain issues have been resolved.

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 manged 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.

imc STUDIO Version 5.0R10

1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1 Firmware 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.

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.

3 Setup and Device Control

Default Values

Pre-set "Default Values" are now also applied to imc CANSAS channels.

imc STUDIO Version 5.0R9

1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1 Firmware 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.

1.2 Firmware 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.

Field-bus

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.

1.3 Firmware 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 BUSDAQ*flex*

imc BUSDA*flex* units delivered after May 15, 2017 come with the following new software properties:

- IRIG-B synchronization
- NTP-synchronization
- Webserver support

Field-bus

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.

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.

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 Field-bus modules

Some Field-bus module error messages now include extra information on the module affected. Previously, the message usually only read: "Call the Field-bus Assistant". Now there is an additional notification of which device, which Field-bus type, and which slot are affected.

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

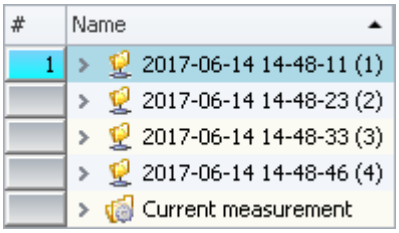
The text background can be made to depend on the zones by using the property: "Textbox color". By selecting "Zone color", the corresponding zone color is displayed as the background color. By selecting "Default color", the text background color setting is applied.

5 Data Browser

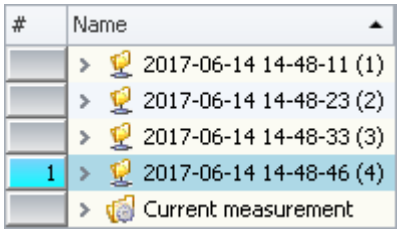
Navigation among measurements has been improved

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.

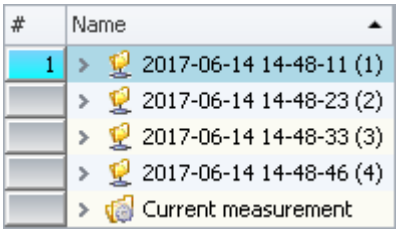
An example of navigating through the measurements with a step length of 3:



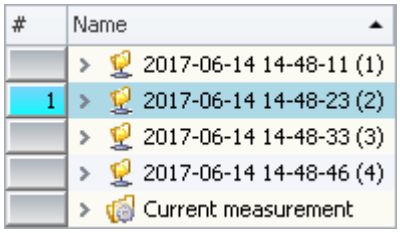
Start



First click

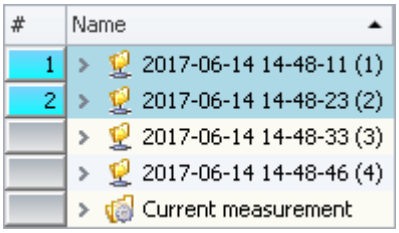


Second click
Previous behavior: After the flip-over, the first measurement was always the operative selection

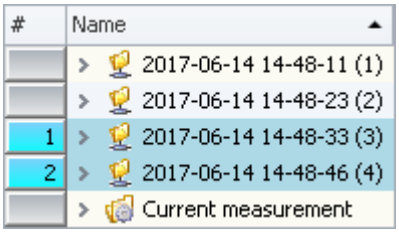


Second click
New behavior: Correct counting

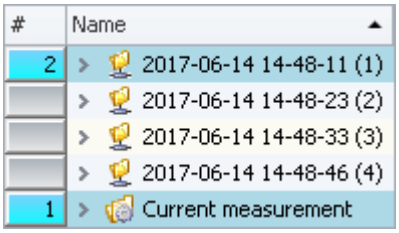
Another example: Two measurements are selected. The step length is 2. In this way, with every step you take, the next two measurements are always compared with each other. In accordance with the new behavior, the selected measurement retain their relative positions to each other.



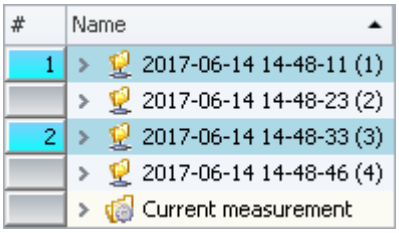
Start



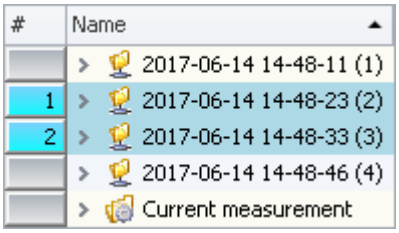
First click



Second click



Third click
Previous behavior: After the flip-over, the first measurement was always the operative selection



Third click
New behavior: Correct counting

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)

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.

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.

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.

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 the imc Hotline.
  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.

11 Powertrain Monitoring

Corrections of texts

The English texts in the software interface have been partially revised and corrected.

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 the imc Hotline. 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 the imc Hotline.

imc STUDIO Version 5.0R7

1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1 Firmware 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 23 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
```

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
```

Field-bus

Minimizing data volume requirements on the device hard drive by means of compression

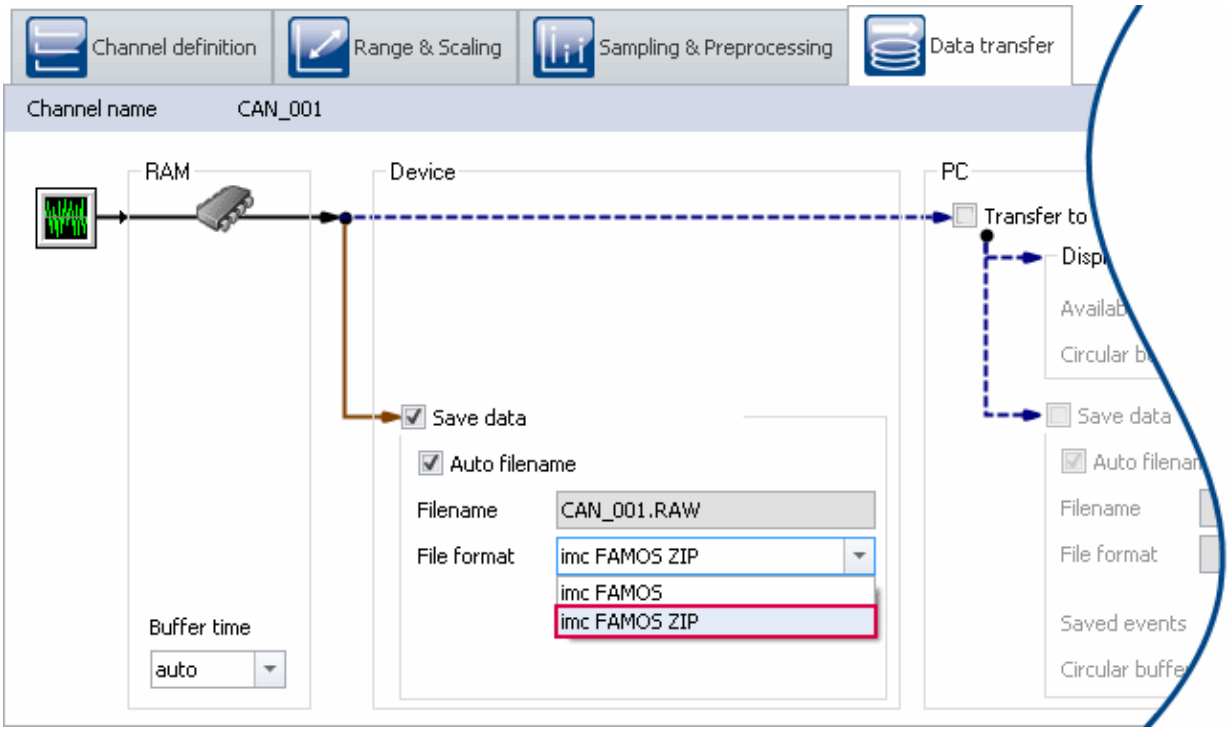
Data storage capacity consumption of Fieldbus channels on the device hard drive can be reduced by means of a new file format: imc FAMOS ZIP. In the background, the file size is minimized by means of zip-compression. The result depends accordingly on the nature of the signal.

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 hotline 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-Field-bus



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 check marked. 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.

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.

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.

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 field are now also analyzed in "Setup page as dialog"

Metadata columns can be defined as mandatory fields. Mandatory fields 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 fields 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.

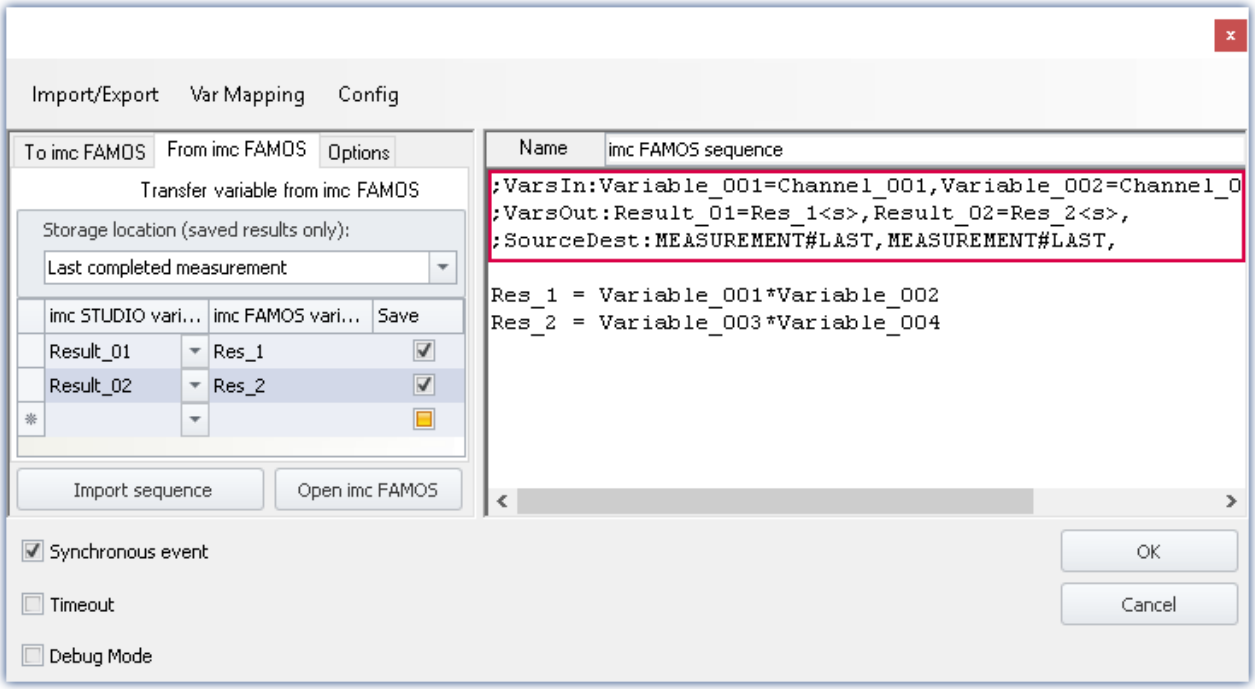
5 Commands

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 fields are now also analyzed in "Setup pages as dialog" 21

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]
```

Notes on assignment

The first element is addressed with the value "1". The second with "2", etc.

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

imc STUDIO Version 5.0R6

1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1 Firmware 2.9R2

Device groups

The firmware supports the new devices of the class: imc BUSDAQ*flex*. imc BUSDAQ*flex* 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 field-buses and vehicle buses.

imc BUSDAQflex-2-S

imc BUSDAQ*flex* (BUSFX) is compatible with the imc CANSAS*flex* 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 BUSDAQ*flex* 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).

Field-bus

As of this version, many imc devices support the Field-bus: CAN FD; details are provided in the spec sheet: Field-bus 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 all relevant varieties of the CAN FD standard (ISO and non-ISO).

Note: Hardware-Upgrade

An upgrade is available for imc CRONOS*compact* (CRC) systems as well as for imc CRONOS*flex* 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 revise 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 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	Firmware	CRC	Firmware	CRFX	Firmware
ICPU-8	●	2.7R3	---		---	
DCB-8	●	2.7R3	---		---	
LV2-8	●	2.7R3	---		---	
UNI-8	●	2.7R3	---		---	
ISO2-8	●	2.7R3	●	2.7R3	●	2.8R5
ISOF-8	---		---		●	2.9R2
UNI-4	●	2.8R7	●	2.7R3	●	2.8R5
SC2-32	●	2.7R3	●	2.7R3	---	
ICPU2-8	Ø		●	2.8R7	●	2.8R5
UNI2-8	Ø		●	2.8R7	●	2.8R5
DCB2-8	Ø		●	2.8R7	●	2.8R5
LV3-8	Ø		●	2.8R7	●	2.8R5

Device	Feature	Firmware
Cx-41xx-N	●	2.8R7
SPAR-U	●	2.8R7

●: Feature supported

Ø: Feature currently not supported

---: Amplifier not available for this device series

imc STUDIO 3.0R4	included firmware 2.7R3
imc STUDIO 4.0	included firmware 2.8R3
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.

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.

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

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".

imc STUDIO Version 5.0R5

1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1 Firmware 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 und 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.

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.

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.

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.

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:
	`path = FileName?(Channel_001)`
	`id = FileOpenDSF(path, 0)`
	`comment = FileComm?(id)`
	`FileClose(id)`
	Unterstützt wird:
	• 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-Field-bus"-configurations possible.

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.

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.

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 the imc Hotline.

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).

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.

imc STUDIO Version 5.0R3

1 imc STUDIO Version 5.0R3 build March 7, 2016

1.1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1.1 Firmware 2.8R7 SP3 dated April 22, 2016

CRFX/ISO2-8

Optional support of thermocouple type-C (2320C°/24bit).

1.1.2 Firmware 2.8R7 SP2 dated March 9, 2016

Field bus - 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().

1.2 General Changes in imc STUDIO

Localization

Display and notification texts have been partially revised.

1.3 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.

1.4 Setup and Device Control

Column: Module SN

The column "Module SN" now only returns the serial number of the housing for CRFX-modules.

1.5 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.

1.6 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.

2 imc STUDIO Version 5.0R3 build December 15, 2015

2.1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

2.1.1 Firmware 2.8R7 SP1 dated December 14, 2015

Field bus - 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.

2.2 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.

2.3 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.

2.4 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.

2.5 Update Notes

Revisions of the menu ribbon regarding user guidance:

- The names of some buttons have been elaborated (z.B: *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.

3 imc STUDIO Version 5.0R3

3.1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

3.1.1 Firmware 2.8R7 dated August 26, 2015

3.1.1.1 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.
- CRONOS*compact*/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	Firmware	CRC	Firmware	CRFX	Firmware
ICPU-8	●	2.7R3	---		---	
DCB-8	●	2.7R3	---		---	
LV2-8	●	2.7R3	---		---	
UNI-8	●	2.7R3	---		---	
ISO2-8	●	2.7R3	●	2.7R3	●	2.8R5
ISOF-8	---		---		●	2.9R2
UNI-4	●	2.8R7	●	2.7R3	●	2.8R5
SC2-32	●	2.7R3	●	2.7R3	---	
ICPU2-8	Ø		●	2.8R7	●	2.8R5
UNI2-8	Ø		●	2.8R7	●	2.8R5
DCB2-8	Ø		●	2.8R7	●	2.8R5
LV3-8	Ø		●	2.8R7	●	2.8R5

Device	Feature	Firmware
Cx-41xx-N	●	2.8R7
SPAR-U	●	2.8R7

●: Feature supported

Ø: Feature currently not supported

---: Amplifier not available for this device series

imc STUDIO 3.0R4	included firmware 2.7R3
imc STUDIO 4.0	included firmware 2.8R3
imc STUDIO 5.0R1	included firmware 2.8R5
imc STUDIO 5.0R3	included firmware 2.8R7
imc STUDIO 5.0R6	included firmware 2.9R2

UPS

The device preforms a check the UPS and reports any defects upon connection.

3.1.1.2 Field bus

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 adressing 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.

3.1.1.3 imc WebServer

WebServer-configurations can now be exported and imported with the WebDesigner.

3.1.1.4 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.

3.1.1.5 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 mens of the UserModel/Enable-block. This block must be set to the parameter value "reset states when enabled".

3.2 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 measuremet 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* 58.
- 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 und 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.

3.3 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

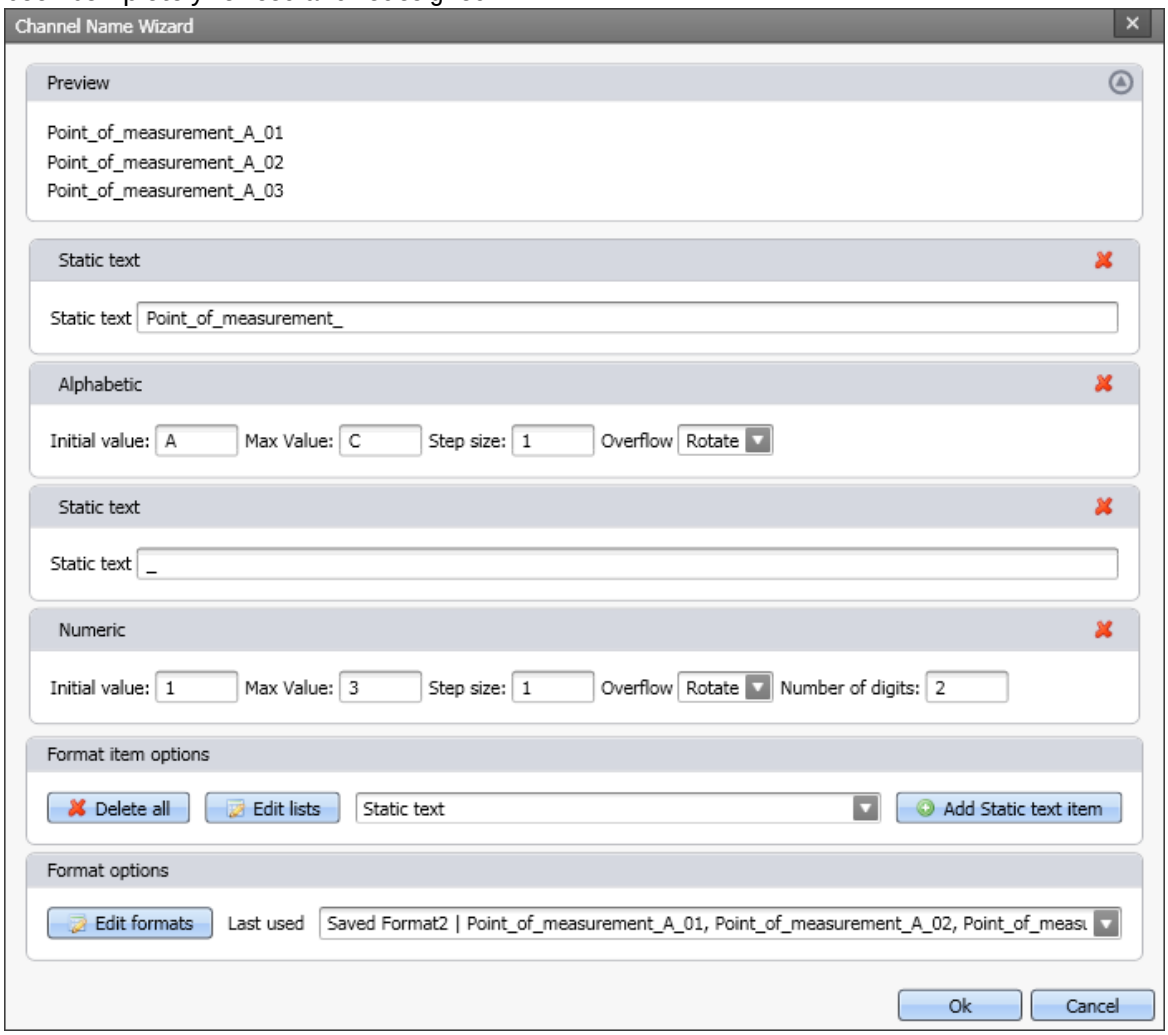
The pretrigger is defined for channels which are assigned to a defined trigger. Channels without such a trigger assignment, in other words, which are started directly when the measurement is started, are assigned to the symbolic special trigger "Trigger_48". If one deleted a trigger assignment for a 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.

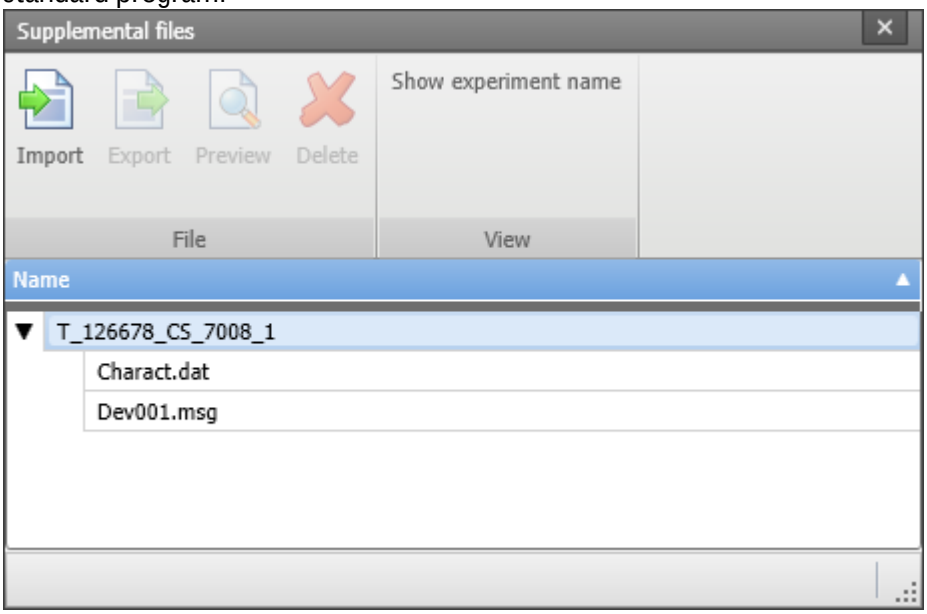
Channel Name Assistant

For the purpose of changing multiple channel names, the "Channel Name Assistant" is provided. It has been completely revised and redesigned.



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 field-bus 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".

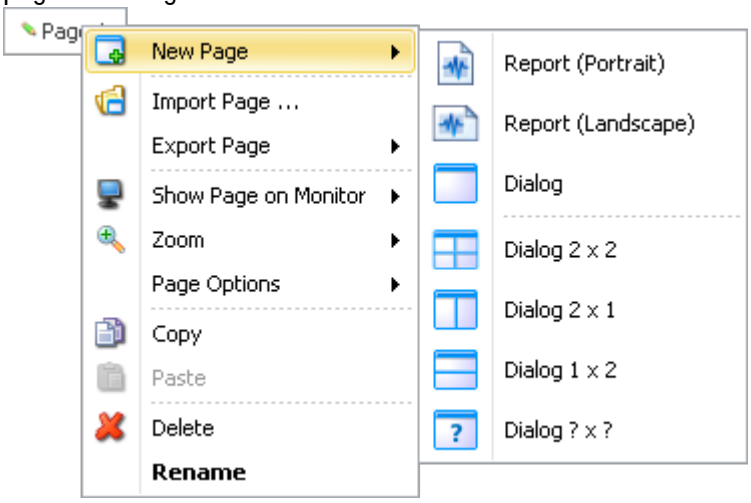
3.4 Panel

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.



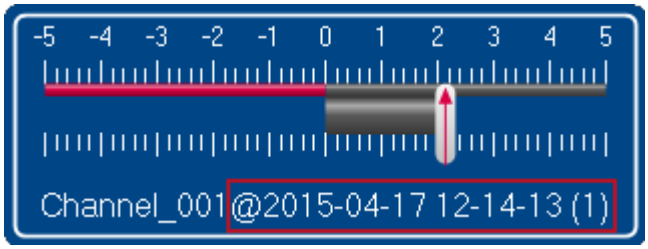
- By means of the context menu for variables in the Data Browser, it is possible to display the selected variables in free-floating curve windows or in the "Current Values"window.

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.

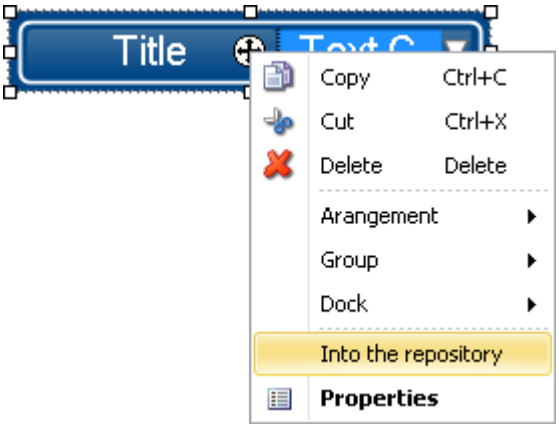
Measurement name in the title

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.

3.4.1 Widgets

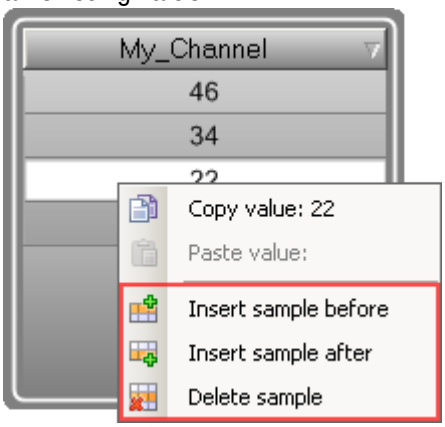
Curve window

- 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).

Input, Output > Numeric with slider

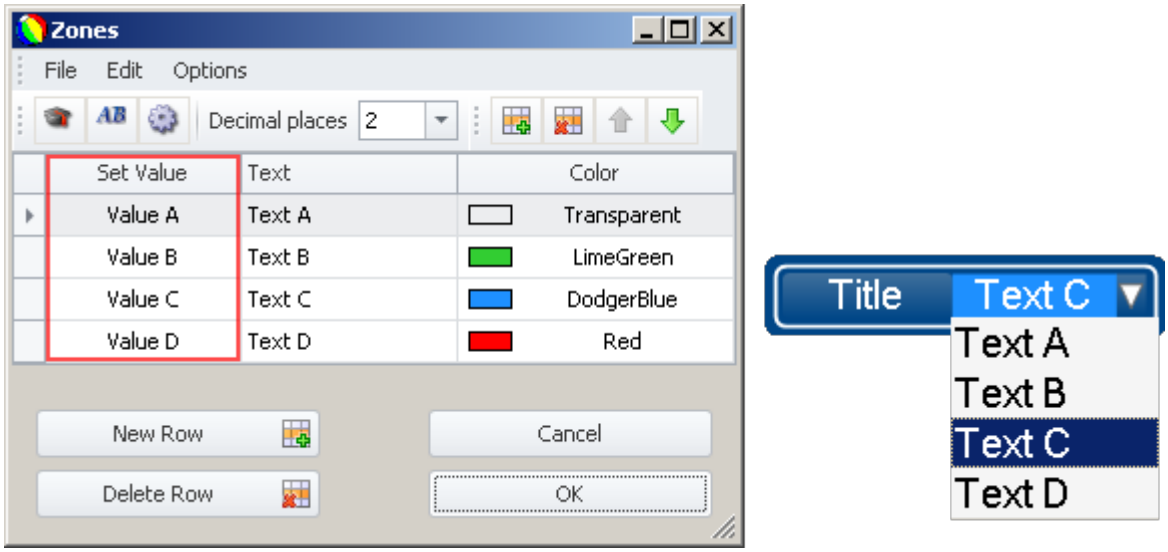
The midpoint has been implemented as for the Bar graph. The slider starts at 0 and from there deflects in the respective direction appropriate. Here, too, the midpoint can be arbitrarily defined as desired.

Input, Output > DIO

For binary-, octal- or hex-representation, the maximum bit count has been increased. Doubles are represented with up to 50 bits, Floats with up to 22 bits (7 decimal places).

Input, Output > List

Using the List, text-variables can be assigned user-defined texts. The selection list can now also be filed with texts as well as with numbers.



Graphical switch

The control can be rotated. The angle can be set either to a fixed value or to depend on a variable.

Clock

By default, clocks display the PC time. But they can also display different times, subject to the variables connected.

Variable: Analog channel

Property: Representation	Time displayed
Standard	the channel's current measurement duration (matches "duration")
Start time	the channel's starting time
Duration	the channel's current measurement duration
Current measurement time	the channel's current time (matches the device's time while measurement is running)

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.

3.4.2 Navigation bar

Datacut - 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.

3.4.3 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.

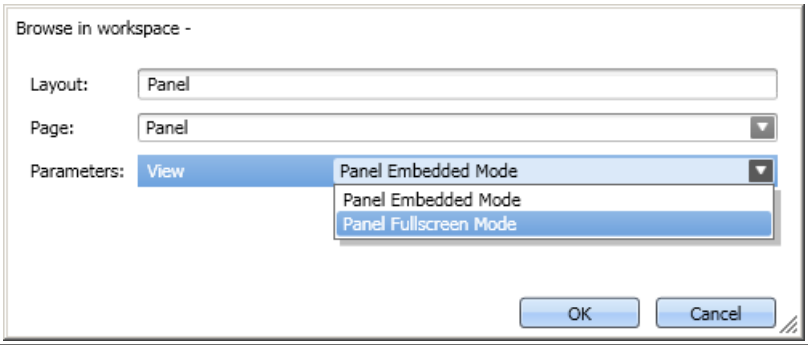
Drag&Drop for variables has been improved

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

3.5 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. 
Email	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").

3.6 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" 56.

User-defined events

It is now possible to open the event configuration by double-clicking.

3.7 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.

3.7.1 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 runnning. 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	

3.7.2 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 Meßsysteme GmbH. It can be combined and operated with various basic editions of imc STUDIO.

3.7.3 Bus Decoder

Expansion package for decoding Field-bus 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 Field-bus communication ("Logfile").

The decoding information which is usually located in separate configuration files (e.g. with CAN in *.dcb) is instead in 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)

3.8 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" geändert.
- 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.

3.9 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.
AgilentInfniiVision 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".

3.10 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*.

3.11 Video

Video codec "H.264"

The video codec H.264 from Leadtools is now supported.

3.12 Update Notes

3.12.1 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:

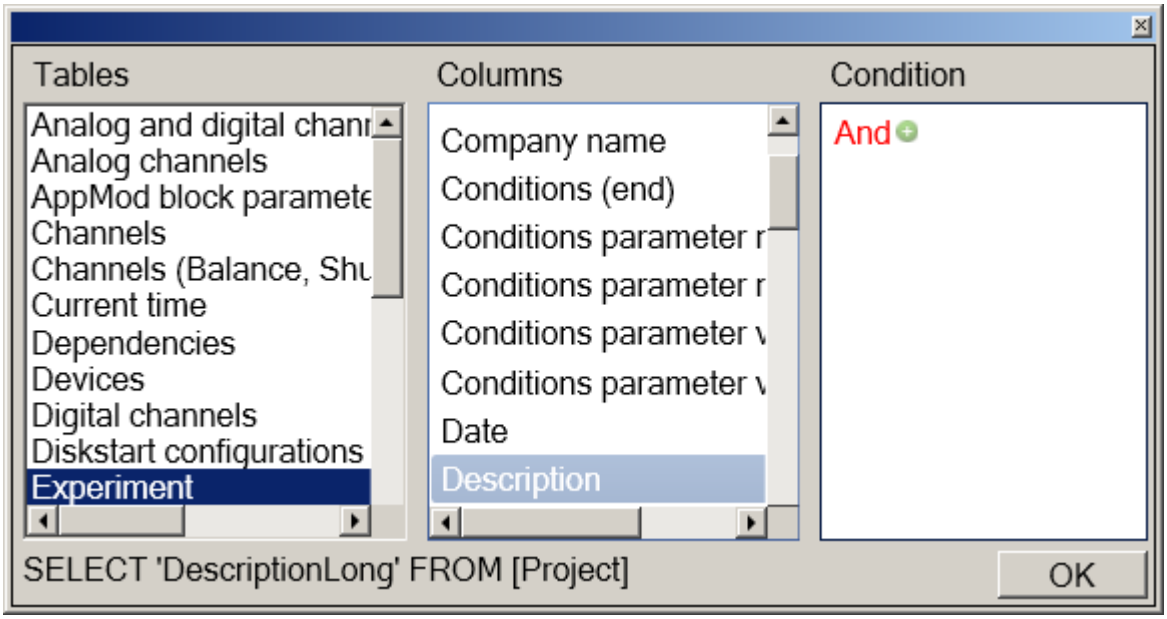
Column identifier with spaces in the name could not be resolved. In order to make this possible, the syntax needed to be revised. Column identifier are now always expected in apostrophes (' '). Old, saved placeholders (without the appropriate brackets) may in some cases fail to be resolved.

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:

3.12.2 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;
    }
}
```

imc STUDIO Version 5.0R1

1 imc STUDIO Version 5.0R1 build February 08, 2015

Minor bug fixes.

1.1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

1.1.1 Firmware 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

2 imc STUDIO Version 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.

2.1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

2.1.1 Firmware 2.8R5 SP10 dated January 30, 2015

No changes.

2.1.2 Firmware 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 mit OSC-16

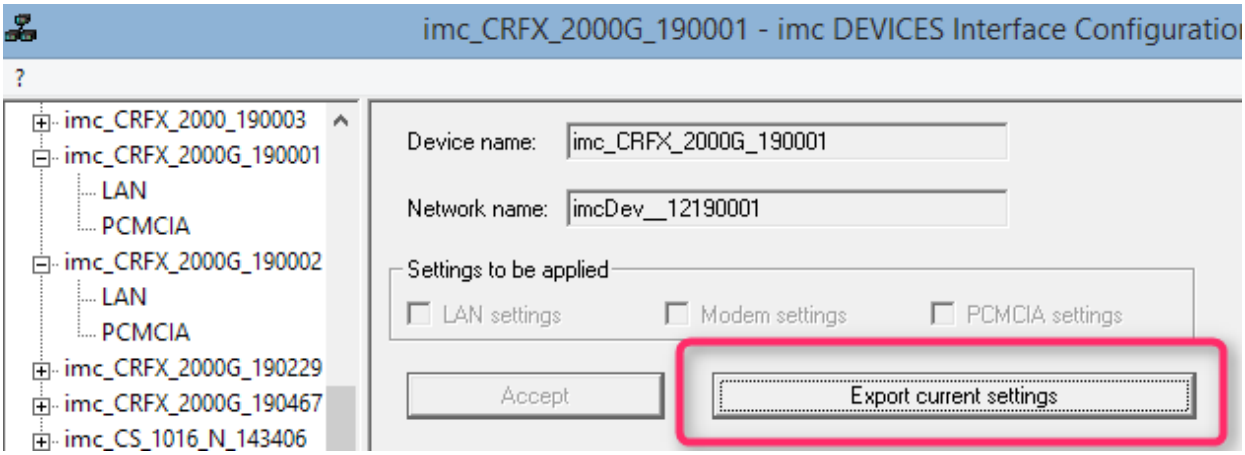
  Supported low pass filters are 16.6 Hz, 50 Hz, 60 Hz, 200 Hz and 400 Hz.

- CRFX/ISOF-16-D37-SUPPLY

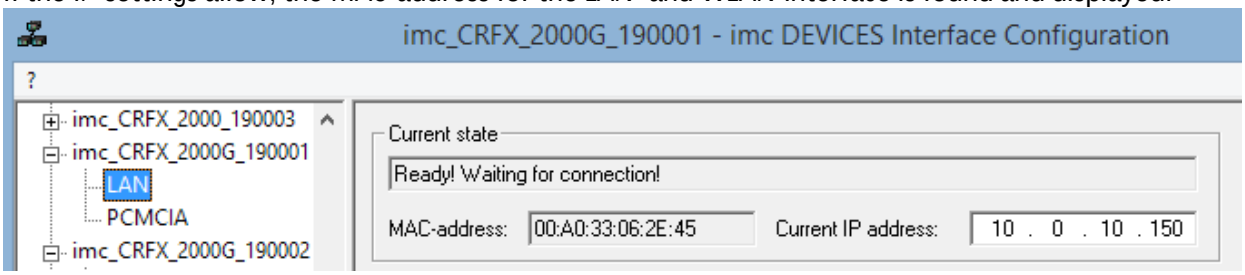
  Bipolar supply has been added.

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).

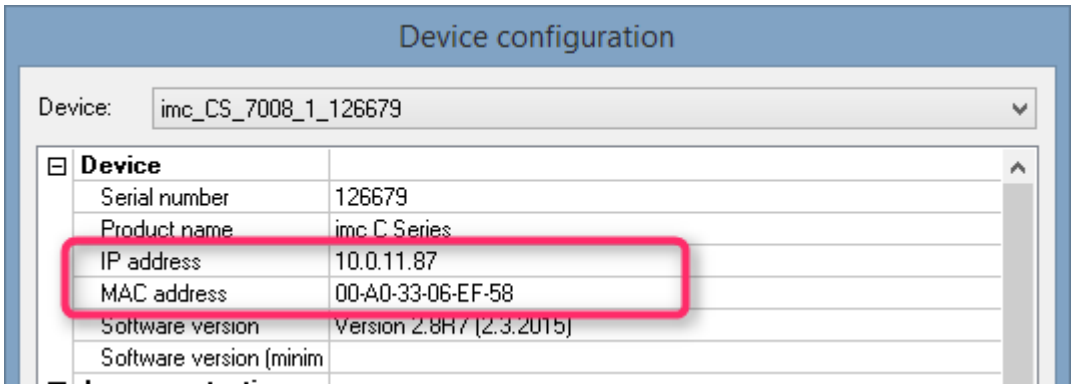
2.1.3 Firmware 2.8R5 SP8 dated September 18, 2014

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.



CRFX- ICPU2-8

0.07 Hz high-pass filter implemented.

ITPCom-Assistant

Signal selection screening for IPTcom has been added.

3 imc STUDIO Version 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.

3.1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

3.1.1 Firmware 2.8R5 SP7 dated August 05, 2014

LIN-Bus Power Management

LIN *PowerManagement commands* (Wakeup, Sleep) can now be triggered by a DisplayVariable.

3.1.2 Firmware 2.8R5 SP6 dated June 24, 2014

imc BUSDAQ-Autostart

Improved error handling for devices having Autostart.

3.1.3 Firmware 2.8R5 SP5 dated April 24, 2014

LIN

Import of LIN configurations via COM interface has been implemented.

4 imc STUDIO Version 5.0R1 build March 05, 2014

4.1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

4.1.1 Firmware 2.8R5 SP4 dated March 27, 2014

Desktop symbol for device access

"imc DEVICES" is now called "imc Systems" and has a new desktop icon.

4.1.2 Firmware 2.8R5 SP3 dated March 5, 2014

No changes.

4.2 Documentation/Help

Document	Chapter	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

Document	Chapter	Description
	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 Field-busses 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

5 imc STUDIO Version 5.0R1 build November 14, 2013

5.1 Firmware and new hardware

This imc STUDIO version has been released along with the following versions of the firmware (imc DEVICES).

5.1.1 Firmware 2.8R5 SP2 dated December 13, 2013

TEDS: Adopting channel names

When the channel name is adopted, the device name is no longer appended of there is only one device in the experiment.

5.1.2 Firmware 2.8R5 SP1 dated November 13, 2013

CRFX/SYNTH-8

Module CRFX/SYNTH-8 is now supported.

5.1.3 Firmware 2.8R5 dated October 9, 2013

5.1.3.1 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 CRONOS*flex* (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.

5.1.3.2 Field bus

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.

5.1.3.3 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.

5.2 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.

5.2.1 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.

5.2.2 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.

5.3 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.

5.3.1 Assistants

- The assistants (e.g. CAN-Assistant) are only offered now if the 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 RoaDyn application is available.

5.3.2 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.

5.3.3 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 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.

5.3.4 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.

5.3.5 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 72.
- Access to saved measurements and their corresponding metadata is possible by means of the placeholder MEASUREMENT, see Placeholders 71.
- Under the tab "Data Transfer" for the individual channels, the device-specific data storage options are shown.

5.3.6 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.

5.4 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 .

5.5 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.

5.6 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".

5.6.1 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 selcted.
- 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.

5.6.2 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 considerd for in the calculation of the visible range.

5.7 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 72 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 us 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.

5.8 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.

5.9 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 72.
  - 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.

5.10 Project Management

When loading/saving experiments, a progress indicator is displayed.

5.10.1 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 71 can be used.

5.11 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.

5.12 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".

5.12.1 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.

5.12.2 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.

5.12.3 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".

5.13 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.

5.13.1 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.

5.14 Data Processing

Processing of single values is possible.

5.15 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.

5.15.1 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.

5.15.2 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.

5.15.3 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".

5.16 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.

5.17 Documentation/Help

Document	Chapter	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 und 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
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

Document	Chapter	Description
	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

5.18 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 es 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.