

# imc STUDIO

measurement • data analysis • visualization • automation



**Integrated software for the entire testing process**



### **imc STUDIO - at a glance**

The intuitive software for the entire test & measurement process - from data acquisition and live-monitoring to test stand automation

- Hardware configuration and administration
- Graphical user interface design
- Visualization and analysis of measured data
- Efficient trigger logic
- Real-time analysis and results
- Setup control
- Complete real-time test automation
- Project management
- Multi-monitoring
- Integration of real-time simulation
- Synchronized capture of video and measurement data

# The next leap to testing efficiency

## imc STUDIO - the software that shortens the way to your goal

You know your goal - and imc STUDIO will enable you to obtain your results by the shortest route possible. Today, you may want to test an electromechanical component on a test stand; tomorrow, you may have to subject the newly installed component to a driving test; and the day after that, you might want to carry out final measurements in the climatic chamber. With imc STUDIO, this is easy. The functionality of this modular software can be adapted to changing requirements. Intelligent control concepts ensure that you can reach different goals efficiently without detours.

### Fully equipped for manifold measurement tasks

From the configuration of your measurement devices for quick data acquisition to fully automated test stands, imc STUDIO addresses all aspects of advanced testing. Together with the imc hardware, imc STUDIO

captures, processes and visualizes analog and digital signals. Furthermore, it handles control tasks and integrates video and audio, as well as automation and simulation environments. One particular advantage of the software is its capability to be tailored to different users with their specific needs and levels of experience.

Project management and data analysis complement the workflow, which is easy and safe to operate. In addition to the optimal support of imc measurement hardware, imc STUDIO offers standardized interfaces for the integration of third party systems. The application areas range from individual measuring stations for mobile or stationary tests to networked and database driven test center. The global exchange of data among different application groups via Internet is supported.





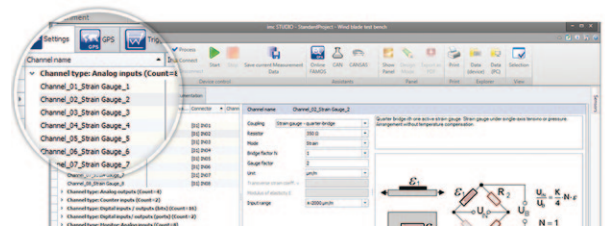
“As a modular software framework, imc STUDIO combines many separate tools in a seamless and integrated environment. Within this framework, users are able to both quickly perform basic measurements and create sophisticated test configurations. These may incorporate elements from the graphical user interface, perform manual and automated test control, utilize imc FAMOS analysis sequences and manage complete automation systems.”

Dr. Franz Hillenbrand, Head of development & founder of imc

## Obtaining results faster with imc STUDIO

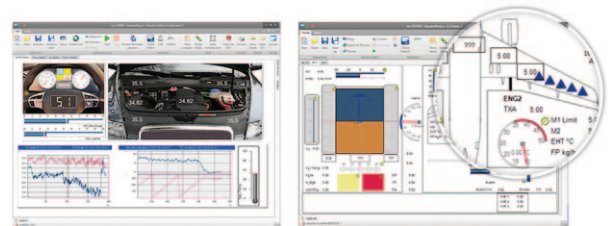
### Configure and measure

With imc STUDIO, you are ready to start your measurement in a few minutes. A clearly organized channel configuration list, extensive sorting and filtering functions, numerous assistants, built-in sensor management and support of TEDS are just some of the useful functions for achieving quick, intuitive system configuration.



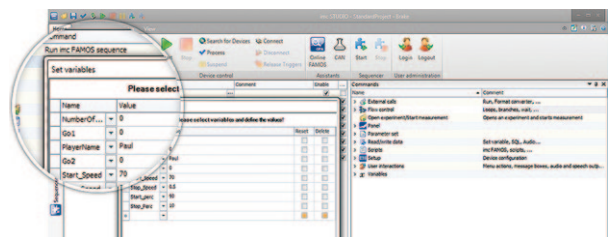
### Data display and system operation

With just a few mouse clicks, you can design tailor-made user interfaces with the imc STUDIO Panel, and link them to the system's inputs and outputs. Choose from over 100 predefined instrument templates and elements (widgets) to create your own personal test and measurement interface.



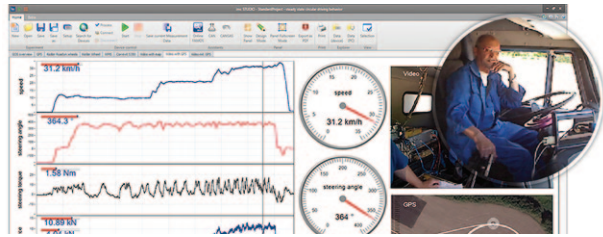
### Automating routine tasks

Save time by automating routine measurement processes using imc STUDIO. Use the drag & drop technique to create your own personal test sequence by selecting from a wide variety of functions - such as channel balancing, entering test object data, starting measurement, saving data, running analysis and printing out a report. That's it!



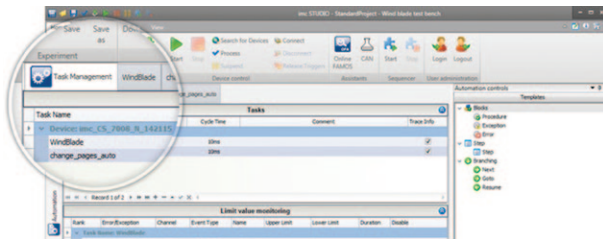
### Recording and playback of videos

imc STUDIO Video addresses the increasing demand to combine and synchronize conventional measurement data with video capture. Simply connect a video camera, and imc STUDIO will take care of the rest. Like any measurement channel, the video channel is automatically synchronized, and offers pre- and post-triggering, versatile storage options and a replay function.



### Easy test stand automation

Let control of the test environment be an integral part of your measurement application! When testing components, imc STUDIO not only measures the performance of the test object, but also allows you to integrate real-time automation and control for your test station - without programming one line of code. You simply define a state oriented test process and use drag & drop to insert ready-made functions for specifying target values, actuator profiles, control logic and even multi-variable closed loop control systems.



## Ready for upswing?



In some test and measurement projects, the bar is so high that you need a really good tool to tackle it. imc STUDIO is the proven software for the entire measurement process.

imc STUDIO menus automatically adapt to the hardware involved and to the task at hand. Three different view options allow you to choose the most appropriate representation optimized between ease of use, intuitive overview, and availability of even the more sophisticated functions.

Assistants for automated channel naming, for saving and exporting data, and for analysis tasks enhance your efficiency. In addition, hundreds of widgets and sequencer commands facilitate precisely adapted visualization and effective operation.



### Project management with leverage effect

imc STUDIO's project management enables you to fully administrate and store all relevant data belonging to a measurement or test campaign. In addition to the

measurement data, these include metadata, project-related information such as pictures and documents, and configuration and display settings. Project templates with default settings shorten the way to the goal. Once saved, they can serve as initial defaults at any time and be re-used by team members on your new projects.

### Metadata: augmenting your measurements

Metadata are additional descriptive information, such as text comments, video footage, photos or links to other documents or sources, which can be used to enhance the measured data. With imc STUDIO, metadata are systematically filed in the Data Browser, and can easily be searched and sorted. Thus, whether you are conducting experimental level measurements (such as a brake test) or performing end-of-line testing, a wide assortment of additional information can easily be used to augment the test and gain more thorough knowledge.

### Report channels facilitate post-processing

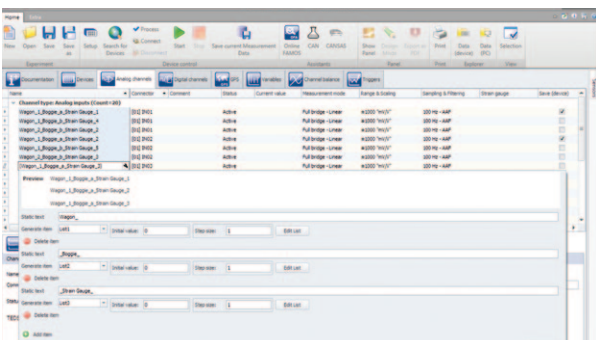
Meta information (like report channels) is essential when interpreting a measurement. But this extra information is not provided by sensors and data acquisition directly. It has to be entered by human operators. For example when conducting a test on a moving train, the engineer records the comment "tunnel" at each tunnel transit. Later, the measurement data can be crawled for this search term, and the user receives all data points that correlate with the "tunnel" event.

### Efficiency with large numbers of channels

Users who deal with a large number of channels also benefit: When conducting a measurement with multiple parallel measurement systems, configuration settings are loaded simultaneously to all devices. Even when dealing with over 5000 measurement channels, the configuration is done in a few seconds - including channel balancing. Furthermore, multiple networked devices can be controlled independently in terms of Connect/Start/Stop, etc. This allows, for example, multiple test stands to be controlled by a single imc STUDIO application.



Multichannel measurements are common in railway applications, for example. imc allows decentralized, distributed and synchronous data acquisition involving thousands of channels - both inside and outside the rail vehicle. Due to the intelligent interaction with software solutions, the user obtains real-time results and can easily create reports.



### Multi-monitoring

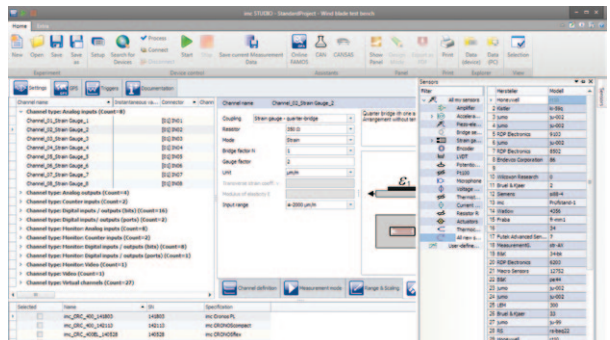
imc STUDIO Monitor allows multiple users to simultaneously view live data at multiple PCs. Each workstation can configure its own views and thus take on different monitoring tasks.

In addition to pure visualization, you can complement your data with time-related meta information, such as audio comments or text marks. Local data storage on each monitoring station is also possible.



### Configuration made easy

imc SENSORS, a sensor database, stores all relevant sensor data, which can be used for individual channel setup. Simply drag & drop a selected sensor onto the respective system channel to automatically assign setup settings like ranges, names or scaling, including the association of characteristic curves for individual sensor linearisation. imc STUDIO will do a substantial contribution to your operating efficiency.



# In Practice

## Component testing - a perfect task for imc STUDIO!

"I need the data by tomorrow at noon". Your customer's deadline is clear. But setting up a small test stand and performing a component test is usually a challenging task. However, you've already got the 16 channels of the imc measurement system in place – and the car door undergoing the window test is already mocked up on the test stand and ready to go ... so what's left? Nothing ... except:

- System and channel configuration
- Setup of CAN data interface
- Creating statistical data analysis
- Configuring the test procedure
- Creating the user interface
- Defining the automation task
- Designing a report

Relax – with the right tool this challenge is easy to handle. Use imc STUDIO! Initial configurations, as well as changes on-the-fly, are quick and intuitive.

**System und channel configuration:** Creating a new 16-channel experiment configuration in the software is not a challenge. With the help of imc STUDIO Setup, you can configure all of your measurement tasks within a few minutes. The simple spreadsheet design and built-in channel assistant allow for user-friendly operation with functions such as copy & paste, search & sort and automatic channel naming. All of this, along with the integration of the comprehensive sensor database, imc SENSORS, will provide you with an

expert overview of the project and guide you to your results.

**Setup of CAN data interface to communicate with the car controller:** Most car component tests require the integration of CAN data. With imc STUDIO the integration of CAN information is literally a mouse click away. By means of a CAN assistant, CAN data is recorded with full decoding – not just as CAN-dump files – but channel by channel. All CAN information, together with the 16 analog channels, can be recorded, viewed and evaluated in real time.

**Creating measurement statistics & configuring the test procedure:** The test is simple. A door window runs up and down. After every cycle, the individual "up-run" and "down-run" data need to be statistically processed and evaluated. However, the test has to be repeated for hours without any interruptions.

This is a task for the imc STUDIO Sequencer. It automates testing procedures: Start...Stop...Evaluate... Repeat; three steps and a loop.

Another powerful tool available for data evaluation is the signal analysis software imc FAMOS. Containing a few evaluation lines for every channel, the script sequence of imc FAMOS can quickly calculate all required statistics and immediately display all the results on the imc STUDIO Panel – after every cycle.





**Creating the user interface:** With two panels of real-time data and a result page filled with imc FAMOS evaluation results, the user interface only needs some simple modifications. Prior test panel pages deliver the template for the new test.

To create a panel use only drag and drop. Relinking the gauges and curve windows from the old experiment to the new analog channels takes only seconds and adding a few new display elements is easy to do.

**Defining the automation task:** Running and controlling a component test stand lies in the realm of imc STUDIO Automation.

As part of imc STUDIO Developer, it can take care of any control task. With extremely low latency and direct access to all imc hardware inputs and outputs, it allows for real-time open and close loop control. Moreover, the time consuming integration of a third party controller is not required, as the time critical processes execute on the dedicated real-time platform that is an integral part of the imc measurement devices.

The setup for the car door window test requires the window to be driven up and down, start and end conditions to be defined, and exception and error handling to be accounted for. By using a unique approach to configuration and setup of automation tasks, imc STUDIO Automation guarantees maximum time efficiency – without programming or complicated syntax.



**Designing a report:** In imc STUDIO, curve windows, tables, texts, pictures and all other widgets can be included in the report. Furthermore, all measurement data and results created by imc FAMOS can also be used. The direct access of imc FAMOS to panel pages and their widgets guarantees a seamless integration of all analysis data onto the result panel. A final mouse click creates a PDF.

**Shortly before the finalization:** Everything is ready to go! The next morning, when it's time to start the test, you only need to check in your sensors and tap into the vehicle's CAN bus. Using imc STUDIO Setup, a quick check of the current values of the live signals can be made to verify the correct calibration values.

From there, the test technician takes over. Pressing the "Start" button in the imc STUDIO Panel, the test technician is asked (via text to-speech support) to begin testing. Back on schedule, the testing can now proceed – as normal. The following day's noon-time surprise doesn't present any problems for your test department. Precisely because imc STUDIO is so quick to (re)configure.



## Your benefit - our goal



### Comprehensive

imc STUDIO covers the entire test and measurement process.

- From quick testing to large scale applications
- From only a few to thousands of channels
- From mobile testing to test stand and production environments
- From experienced users to well guided operators
- From setup of autonomous systems to multi monitoring of distributed systems



### Scalable

Adaptable software provides as much, or as little, capability as is needed for the test.

- imc STUDIO Standard & Runtime Edition – configures, displays, reports
- imc STUDIO Professional – automates analysis and reporting
- imc STUDIO Developer Edition – allows customizing, and offers control and integration capabilities



### Intuitive

Getting results quick requires an intuitive approach towards all configurations & components of the software.

- Assists and guides through setup and configuration processes
- Drag & drop functions dominate configuration procedures
- No programming skills needed
- Linking test results with meta information (e.g., text, pictures, etc.) for intuitive evaluation and assignment of results



### Integrated

imc STUDIO provides seamless integration of hardware and software solutions. It covers all aspects of test & measurement processes.

- Test setup, operation, visualization, analysis, reporting, test process sequencing, real-time test stand control
- Interfaces and plug-ins for third party device integration
- Supports open standards, e.g. IEC, GBIP, CAN, XCPoE, EtherCAT
- Supports different data formats, analysis tools and data bases



### Open interfaces

- imc STUDIO Script enables integration of external hardware components, or to write or use private evaluation procedures
- imc STUDIO provides pre-test integration of additional meta data, real-time I/O, interactivity and post-test storage and analysis

# imc STUDIO: editions and options

The right edition to fit your needs and your budget.

| Function                              | Description  | imc STUDIO Edition |              |           |
|---------------------------------------|--|--------------------|--------------|-----------|
|                                       |  | Standard           | Professional | Developer |
| <b>Configuration</b>                  |  |                    |              |           |
| imc STUDIO Setup                      | Device configuration   | ●                  | ●            | ●         |
| Customizing                           | Customizing & user functions for menus & setup parameters                        | ◇                  | ●            | ●         |
| Layout Designer                       | Extensive customizing, GUI design of setup menus                                 |                    |              | ●         |
| <b>Visualization</b>                  |  |                    |              |           |
| imc STUDIO Panel                      | Customized visualization of data, incl. printable PDF reports                    | ●                  | ●            | ●         |
| imc Curve Window                      | Customizable curve windows incl. color maps, 3D etc.                             | ●                  | ●            | ●         |
| imc STUDIO Widgets                    | Gauges & control elements  | ◇                  | ●            | ●         |
| Full screen view                      | Hidden menus & restricted access (via full screen panels)                        |                    | ●            | ●         |
| Data Browser                          | Management of stored data: browse, search & filter                               | ●                  | ●            | ●         |
| <b>Administration</b>                 |  |                    |              |           |
| Project management                    | Administration & grouping of configurations, templates                           | ◇                  | ●            | ●         |
| Metadata                              | Augmenting data with descriptive information                                     | ◇                  | ●            | ●         |
| User administration                   | Access control, roles and rights management                                      |                    | ●            | ●         |
| <b>Automation</b>                     |  |                    |              |           |
| Panel control elements                | Interactive launch of actions via control widgets                                | ◇                  | ●            | ●         |
| imc STUDIO Sequencer                  | Workflow automation  |                    | ●            | ●         |
| imc STUDIO Automation                 | Real-time test stand automation <sup>(1)</sup>                                   |                    |              | ●         |
| <b>Custom solutions</b>               |  |                    |              |           |
| ext. applications                     | Launch external code (DLL) & executables (exe)                                   |                    | ●            | ●         |
| Scripting                             | User code integration;<br>incl. accessing internal functions & external hardware |                    |              | ●         |
| <b>Optional extensions, see below</b> |  |                    |              |           |
| <b>Analysis</b>                       |  |                    |              |           |
| imc FAMOS                             | Automated analysis sequences, extensive post processing                          | ○                  | ○            | ○         |
| imc FAMOS Runtime                     | Execute autom. analysis sequences (instant post processing)                      |                    | ○            | ○         |
| imc Online FAMOS                      | Real-time analysis on data streams<br>(device based platform & license)          | ○                  | ○            | ○         |
| imc STUDIO PowerQuality               | Powergrid analysis (EN 50160, IEC 61000-4-30)                                    | ○                  | ○            | ○         |
| <b>Data sources</b>                   |  |                    |              |           |
| imc STUDIO Video                      | Synchronized video acquisition   | ○                  | ○            | ○         |
| <b>Operation &amp; admin.</b>         |  |                    |              |           |
| imc STUDIO Monitor                    | Multi-client monitoring & visualization  | ○                  | ○            | ○         |
| imc SENSORS                           | Sensor database integration  | ○                  | ○            | ○         |

● : Included; ○ : Optional; ◇ : Subset of full feature set.

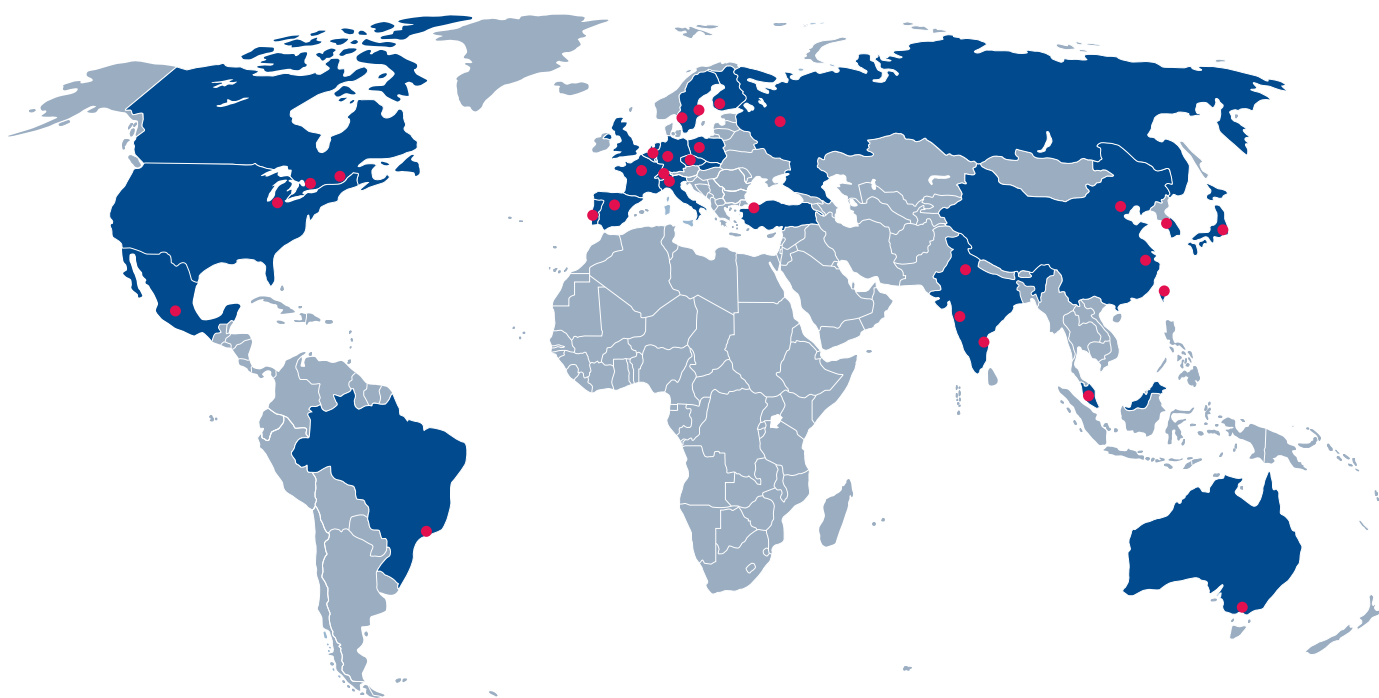
<sup>(1)</sup> requires additional device license imc Online FAMOS Professional

## Free Runtime edition:

The imc STUDIO Runtime Edition allows free execution of existing imc STUDIO applications at various workstations.

## Benefit from our international network

[www.imc-berlin.com/distributors](http://www.imc-berlin.com/distributors)



### imc Meßsysteme GmbH

Voltastraße 5  
13355 Berlin  
Germany

Tel.: +49 (0)30 - 46 70 90 26  
Fax: +49 (0)30 - 463 15 76  
[hotline@imc-berlin.de](mailto:hotline@imc-berlin.de)  
[www.imc-berlin.com](http://www.imc-berlin.com)

 **Álava Ingenieros**  
GRUPO ÁLAVA

The logo for 'Álava Ingenieros' consists of a blue triangle with a white outline, followed by the company name in a bold, sans-serif font. Below it, 'GRUPO ÁLAVA' is written in a smaller, all-caps font.

Edificio Antalia. Albasanz 16. 28037 Madrid  
+34 91 567 97 00 | [alavaingenieros.com](http://alavaingenieros.com) | [alava@alava-ing.es](mailto:alava@alava-ing.es)  
Madrid | Barcelona | Zaragoza | Lisboa | Lima | Quito | Texas