imc WAVE

Getting Started

Disclaimer of liability

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

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

Copyright

Open Source Software Licenses

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

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

Notes regarding this document

This document is an excerpt from the manual of imc WAVE.

The manual for imc WAVE is available both as an e-book and in PDF format. Click on the symbol 🔵 to open the help.

The program "*imc Help and Documentation*" provides you with access to all formats and other documents such as the **device documentation** or the **technical data sheet**.

What is the best way to read the imc WAVE documents?

Getting Started

Before installing the software, start by reading the document "*Getting Started*". This contains important tips for achieving problem-free installation, for updating the software, as well as for operation and integration of devices in measurement setups.

All information presented in the document "*Getting Started*" is also presented in the imc WAVE manual.

Manual - complete documentation

The manual serves as reference material. This document describes how to operate the software and how to configure parameters for the devices. In some case, individual device groups have special functions. The documentation for these usually appear exclusively in the device manuals.

Training programs for introduction to the systems, and advanced workshops

We recommend that before you begin working with imc WAVE you participate in an extensive training session. Such training will enable you to get started working efficiently much faster. Additionally, you will obtain valuable tips and information on how to use the software more effectively. More information is available on our homepage under "*Service & Training*" > "*imc ACADEMY*".

Special notes

> ⚠️ **Warning**
>
> Warnings contain information that must be observed to protect the user from harm or to prevent damage to property.

> ❗ **Note**
>
> Notes denote useful additional information on a particular topic.

> 🔶 **Reference**
>
> A reference in this document is a reference in the text to another text passage.

Table of contents

1 General introduction

1.1 Before you start

Dear user.

1. The software you have obtained, as well as the associated manual are directed toward competent and instructed users. If you notice any discrepancies, we request that you contact our tech support 5 .

2. Updates during software development can cause portions of the manual to become outdated. If you notice any discrepancies, we request that you contact our tech support.

3. Please contact our tech support if you find descriptions in the manual which you believe could be misunderstood and thereby lead to personal injury.

4. Read the enclosed license agreement 7 . By using the software, you agree to the terms and conditions of the license agreement.

! Note	Notes on the descriptions and the screenshots

- The help may also contain parts **shared imc software components**. These parts may differ from the rest of the help in terms of style and structure. All help files are equipped with a full text search functionality and have an index.

- The screen shots appearing in this documentation were created with a **variety of Windows versions** and their appearance may thus differ from that of your installed program.

1.2 Tech support

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

Phone: (Germany):   **+49 30 467090-26**

E-Mail: hotline@imc-tm.de

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

Tip for ensuring quick processing of your questions:

If you contact us **you would help us**, if you know the **serial number of your devices** and the **version info of the software**. This documentation should also be on hand.

- The device's serial number appears on the nameplate.
- The program version designation is available in the About-Dialog (click on the symbol 🛈 in the menu bar).

Product Improvement and change requests

Please help us to improve our documentation and products:

- Have you found any errors in the software, or would you suggest any changes?
- Would any change to the mechanical structure improve the operation of the device?
- Are there any terms or explanations in the manual or the technical data which are confusing?
- What amendments or enhancements would you suggest?

Our tech support 5 will be happy to receive your feedback.

1.3 Service and maintenance

Our service team is at your disposal for service and maintenance inquiries:

E-Mail: service@imc-tm.de

Internet: https://www.imc-tm.com/service

Service and maintenance activities include, for example calibration and adjustment, service check, repairs.

1.4 Legal notices

Quality Management

imc Test & Measurement GmbH holds DIN EN ISO 9001 certification since May 1995 and DIN EN ISO 14001 certification since November 2023. You can download the CE Certification, current certificates and information about the imc quality system on our website: https://www.imc-tm.com/quality-assurance/.

imc Warranty

Subject to the general terms and conditions of imc Test & Measurement GmbH.

Liability restrictions

All specifications and notes in this document are subject to applicable standards and regulations, and reflect the state of the art well as accumulated years of knowledge and experience. The contents of this document have been carefully checked for consistency with the hardware and the software systems described. Nevertheless, it is impossible to completely rule out inconsistencies, so that we decline to offer any guarantee of total conformity. We reserve the right to make technical modifications of the systems.

The manufacturer declines any liability for damage arising from:
- failure to comply with the provided documentation,
- inappropriate use of the equipment.

1.5 imc Software License Agreement

imc Test & Measurement GmbH
Voltastr. 5
13355 Berlin, Germany
Trade register: Berlin-Charlottenburg HRB 28778
Managing directors: Michael John Flaherty, Frank Mayer

imc Test & Measurement GmbH
Terms and Conditions
Governing the Use of imc Test & Measurement GmbH Software
As of: January 18, 2024

§ 1 Objects of the Agreement

(1) In addition to the "General Terms and Conditions Governing imc Test & Measurement GmbH Deliveries and Services to Customers", these terms and conditions apply to all contracts concluded with imc Test & Measurement GmbH (hereinafter referred to as "imc") which involve the transfer of rights of use to any software developed by imc (standard software, software created or adjusted specifically for the Customer, which is recorded on the machine-decodable data carriers such as data files, databases and database material, updates, upgrades, releases, etc., including corresponding documentation, information and materials, hereinafter referred to as "Software").

(2) The Software is provided to the Customer as an executable object program on machine-decodable data carriers specified in the "Objects of the Agreement". The Software's product documentation is also supplied to the Customer either in print or on a machine-decodable data carrier. Unless otherwise expressly agreed in writing, the Customer is not issued the source code of the Software.

§ 2 Rights of Use, Scope

With regard to any transfer of rights of use to Software created by imc, the following provisions apply:

(1) Basic provisions

   a) The Customer is granted a non-exclusive and – subject to the terms and conditions governing the use of Software by third parties, resale and leasing – non-transferrable right of use to the Software for its own purposes. "Use" signifies running the programs and editing the data records.

   b) Until each due fee is paid in full, the Customer is entitled to use the Software solely on a revocable basis. If the Customer is in default with regard to the payment of fees, imc is entitled to revoke the use of the respective services for the duration of the default. The Customer is granted the permanent right to use copyright protected services, in particular the Software, only upon full payment of the agreed fee.

   c) The Customer agrees to undertake appropriate precautionary measures to prevent unauthorized access by third parties to the Software. The original data carriers and the data carries used to make copies as per the agreement, as well as the documentation, are to be stored in a secure location. Employees are to be notified that the production of copies beyond the scope of the agreement is not permitted.

   d) If the right of use is revoked or expires due to another reason, the Customer is obligated to return to imc the Software, the copies made by the Customer and the documentation. Provided that a physical return of the Software and the copies is not possible due to technical reasons, the Customer is obligated to delete such and confirm deletion to imc in writing.

(2) Reproduction

   a) The Customer is entitled to make copies of the Software only if copies are necessary to use the Software in accordance with the contract. The following are considered cases in which reproduction is necessary: installation of the Software from the original data carrier onto the hard disk drive of the hardware used, as well as loading the Software into the computer memory.

   b) The Customer is entitled to create a backup copy if such is necessary to safeguard future use. Copies may only be made for other purposes after prior written consent has been issued by imc.

   c) The Customer is not allowed to make any reproductions other than those expressly permitted under the provisions of this agreement.

(3) Use of the Software by Third Parties, Resale and Leasing

    a) The Software may be used for the purposes stipulated in this contract, in particular for the Customer's business operations. Access to the Software may also be provided to parties which rely on using the Software as instructed by the Customer. In particular, the Customer is entitled to operate the Software or allow the Software to be operated on data processing devices, which are located on the premises of and are directly owned by a third party company (outsourcing). The prohibition against multiple use remains unaffected.

    b) The Customer may permanently sell or give the Software to third parties provided that the Customer is granted permanent use of the Software. In the context of its period of use, the Customer may temporarily transfer the Software to third parties for a fee or free of charge. The prohibition against multiple use remains unaffected. The Customer is expressly notified that transfer to third parties is not permitted and use by third parties is technically not possible if an individual license must be acquired or an individual activation is required for third party usage, such as in the case of runtime licenses.

    c) With regard to the valid use of Software by a third party, the Customer is obliged to ensure that the third party acknowledges the provisions of this agreement governing the rights of use as binding for such third party. The Customer may not transfer Software and documentation to third parties if there are grounds to suspect that the third party may infringe upon the provisions of this agreement governing the rights of use, in particular with regard to the unauthorized production of copies.

    d) Subject to the provisions stipulated in § 4 Paragraphs 1 and 2 or a deviating express agreement in writing, the Customer may not use the Software while the Software is being used by a third party (prohibition against multiple use); in the event that the Software is transferred to the third party, the customer is obliged to surrender to imc all Software copies including, if applicable, all existing backup copies, or to destroy copies not surrendered.

(4) Decompilation

The reverse translation of the provided program code into other code forms (decompilation), disassembling and other forms of reverse engineering of the various production phases of the Software is not permitted. If interface information is required to achieve the interoperability of a separately created computer program, such may be requested from imc, or a third party to be named by imc, for a minor fee. Section 69 e of the German Copyright Act ("UrhG") remains unaffected by this provision.

(5) Changes by imc

If imc conducts adjustments, changes or enhances the Software on behalf and on account of the Customer, the Customer thus acquires the corresponding rights of use to the changes or enhancements of the Software to which he is entitled according to the stipulations of this agreement.

(6) Exceptional Usage Requests by the Customer

If the Customer requests to use the Software according to terms which deviate from the requirements stipulated in Paragraphs 2 through 5, this exceptional use of the Software must be agreed in writing by imc. In such an instance, the Customer agrees to provide imc with information about the desired scope of use, the pertinent field of application, etc. If imc subsequently grants a license covering the Customer's special intended use, the parties agree that a new license fee is owed by the Customer, which is independent of payments made by the Customer for the previously existing license.

§ 3 Copyright, Protection of the Software

(1) The intellectual property, in particular the copyright as well as all industrial property rights and trade secrets, are retained by imc and are not transferred to the Customer. The Customer's ownership of the machine-decodable data carries and data processing units remains unaffected.

(2) Copyright notices, serial numbers as well as designations and reservations of rights which serve as program identification or a protective right may not be removed or changed. The Customer is obliged to transfer the existing protective right notices to all copies. In particular, backup copies of the Software must be expressly designated as such.

§ 4 License Types, Multiple Use

(1) In the case of a Single-User License, the Software may be activated and run on only one data processing unit. "Activation" refers to the process of transferring the license to the data processing unit.

If the technical specifications for the Software permit a second activation, then the Customer may additionally activate the Software on a second data processing unit. However, the Software may only run on one data processing unit at any one time, not on both simultaneously.

(2) With a Network License, the Software may be run on as many data processing units as the amount of licenses obtained. In this case a central data processing unit acts as the license server for which the activation process is performed.

If the technical specifications for the Software permit a second activation, then the Customer may additionally activate and run the Software on as many data processing units as the amount of licenses obtained. However, these additional data processing units must be used by the same users who operate the Software via the license server.

(3) Subject to the provisions in Paragraphs 1 and 2 or a deviating express agreement in writing regarding network use, multiple use of the Software is not permitted.

(4) If the data processing unit is changed, the Customer is obliged to delete the Software from the hard disk drive of the previously used hardware.

§ 5 Software-Subscription

If the Software used is a software-subscription, the following additional restrictions apply:

(1) The right of use is valid for a limited time period. The start and end of the time period are specified. After the end of the time period, the right of use is expired.

(2) If the Customer wishes to continue using the Software after elapse of the specified time period, the subscription must be renewed.

§ 6 Trial Version

If the Software used is a free trial version, then the following additional limitations apply:

(1) The trial version only entitles the user to test the Software. In particular, commercially productive utilization is not permitted.

(2) The rights of use granted expire after the elapse of a period stated in the product description.

§ 7 License Key

(1) Upon delivery of the Software the Customer receives a License Key. Using this License Key, the Customer is able to activate the Software purchased. By means of this License Key the Customer can also view his license status and order updates and upgrades.

(2) The License Key is to be protected against access by third parties in order to prevent misuse. If, however, a third party gains unlawful access to the Key, the Customer is obliged to notify imc immediately via telephone, as well as in writing, so that the previous License Key may be suspended and a new one issued.

§ 8 Conclusion

(1) The law of the Federal Republic of Germany shall apply under exclusion of private international law. The provisions of the UN Convention on Contracts for the International Sale of Goods (CISG) do not apply.

(2) The place of performance for all obligations arising from this agreement is imc's registered seat. Insofar as the Customer is a merchant as defined by the German Commercial Code (HGB), a legal entity under public law, or a special asset under public law, the exclusive place of jurisdiction for all disputes directly or indirectly arising from the contractual relationship is agreed as imc's registered seat. The same applies to persons who have no general place of jurisdiction in Germany, as well as to persons who have moved their place of residence or usual whereabouts abroad since conclusion of the contract, or whose place of residence or usual whereabouts is unknown at the time the action is filed. In addition, imc is entitled to file suit at the statutory venue.

(3) Oral side-agreements are not valid. Deviating or supplementary conditions as well as modifications of this contract, including this written requirement clause, are only valid if agreed in writing and expressly marked as a modification or supplement.

(4) If certain provisions of this contract are inoperative or unfeasible, this does not prejudice other provisions of the contract. The contracting parties agree to contractually substitute an operable provision which approximates the commercial intention of the contract as closely as possible for any inoperable one.

2 Overview

This document describes the **first steps in operating imc WAVE** and the installation of additional imc products. This document uses textual references to the product documentation.

imc WAVE is an application which is constructed upon imc STUDIO. Many components of imc STUDIO are used. For this reason, some of the descriptions may make reference to imc STUDIO.

imc WAVE (**W**orkstation for **A**coustic and **V**ibration **E**ngineering) is a software package for NVH (Noise Vibration and Harshness) analysis. It is based on imc STUDIO and is installed as a separate instance of imc STUDIO. It can be equipped with multiple, separately licensed analyzers.

The software enables the user to perform measurements, evaluations, data visualization, and to compose reports specifically for acoustic tests. The device families imc CRONOS und imc C-SERIES in particular are used for this purpose.

One distinctive feature of the imc WAVE analyzers is their capability to process not only the primary acoustics signals from microphones and accelerometers, but also additional measurement data channels that an imc device can provide. Such as temperature, mechanical strain (strain gauges) etc., or signals and other information from CAN-busses on board vehicles. This means that operating conditions of the test object and its environment can be measured synchronously along with the acoustic variables, and that the results can be correlated and analyzed accordingly.

imc WAVE comprises comfortable user guidance along the typical workflow, including menus for configuration of the applied measurement systems and calibration routines for the sensors.

The captured measurement data are processed according to comprehensive analysis procedures that are fully compliant with all relevant standards. All data are saved and administered and the results are visually displayed in a selection of pre-defined pages on the PC and as printable reports.

Chapter overview

Synopsis	Section
Startup operations for imc WAVE - **installation** and **product configuration** prior to first use	- System requirements 11 - Installation / Uninstall 13 **Product Configuration / Licensing** 25 **The first start** 25 - Device connection / Network / Firewall 27
The first steps in **connecting with the device**	**Setting Up - Connect the device** 36 - Firmware Version 41
Overview of the software	"What is..." - Terminology 48 - The User Interface 55

Tech support

If you have any open questions about our products, please contact our tech support.

Questions or problems? Contact our Tech support 5.

3 Setting Up - Software

3.1 System requirements

Supported operating systems
Windows 10*/11* (64 bit)
*released in conformance with the version of Windows 10/11 applicable at build date of imc software

Minimum requirements for the PC
4-core CPU 2 GHz [1]
8 GB RAM (recommended: 16 GB RAM) [1]
10 GB free hard disk space (recommended: SSD) [2]
Display resolution: 1280 x 1024 (recommended: 1920x1080)

1   Requirements and recommended minimum configurations for the applied PC will rise with increasing number of connected devices and the resulting overall system data rate. Another crucial factor will be the extend of used live analysis and visualization functions on the PC.
A smooth operation will also heavily rely on sufficient RAM memory resources on the PC: It must ensure to satisfy all vital functions without any outsourcing to slow external swap file (HDD/SSD) in order to guarantee sustainable performance.

2   The hard drive memory requirement increases if measured data are saved to the PC.

Other operating system components

The following components are installed with the imc WAVE setup if they are not already present:

Component	Version	Folder in "System" directory
Microsoft .NET Framework	4.8	DotNetFx4.8
Microsoft VC 2015-2019	14.28.29910	Microsoft Visual C++ Redistributable\2019
Microsoft VC 2010	10.0.402219.1	Microsoft Visual C++ Redistributable\2010
Microsoft VC 2005	6.0.3790.0	Microsoft Visual C++ Redistributable\2005
Microsoft Build Tools 2015	14.0.23107.10	MSBuildTools2015

Supported measurement devices

Which devices you can use in imc WAVE is described in the documentation on the "*Setup*" > "*Device Overview*", as well as in the "*Technical Data Sheet*".

The imc WAVE analyzers can be used with any measurement systems belonging to the imc CRONOS device families or imc C-SERIES. In particular, the devices must be equipped with appropriate measurement amplifier modules for microphones/accelerometers (e.g. IEPE/ICP). Suitable module types: ICPU2-8, AUDIO2-4, QI-4 etc.

The device series imc CRONOS*flex* (CRFX) and imc CRONOS-XT (CRXT) are especially suitable and recommended. These device series digitize the captured signals at a resolution of 24 bits and are therefore a perfect fit for the high dynamic requirements in NVH testing.

Device groups

Firmware imc DEVICES - **firmware group A** (A4-A7)

- imc CRONOS*compact*
- imc CRONOS*flex*
- imc CRONOS-SL-N
- imc C-SERIES with sn. 14xxxx and higher

- imc CRONOS-XT
- imc BUSDAQ*flex* [1]
- imc BUSDAQ [1] with sn. 13xxxx and higher
- imc SPARTAN [1] with sn. 13xxxx and higher
- other customized devices with sn. 13xxxx and higher

Firmware imc DEVICEcore - **firmware group B** (B10-B11)

- imc EOS
- imc ARGUS*fit*

1 : For additional measurement signals such as Fieldbusses (CAN), temperatures, strain gauges, etc.. Not suitable as audio inputs to the analysers.

3.2 Installation - Preparation

Software requires a license

This means that the program may only be started **upon obtaining a license** (see [Product Configuration / Licensing](#) 25).

Administrator rights required

For the purposes of installation and uninstallation, a user account with **administrator privileges for the PC is required**.

If you are logged on to the PC **without administrator rights**, **log yourself out** and log back on with an administration-level user account. If you don't possess the appropriate account type, you will need the support of your system administrator or IT department.

See also [Notes on Windows User Account Control](#) 16 .

Restarting the computer in the process of installation

During the installation process, the installation program will prompt you to restart the PC.

⚠ Note	Restarting
After the restart, login to **the same user account** with which you had previously begun the installation.	

Coexisting applications: imc STUDIO, imc STUDIO Monitor, imc WAVE, ...

Some imc programs are installed as an independent and specially adapted instance of imc STUDIO. They are based on imc STUDIO.

Unless otherwise stated, these programs are installed and used in parallel. As long as these instances are based on the same version of imc STUDIO (e.g. 2022 R1), they are all subordinated to the same program installation, which means they share resources.

For this reason, installation of the instances in this case must be performed in one single shared Setup procedure. Any attempt to perform installation in succession or subsequently will cause the already existing instances to be deleted.

This applies particularly to the joint and parallel installation of imc STUDIO Monitor, imc WAVE and imc STUDIO, which must be performed in a single step.

> Do not install imc STUDIO, imc WAVE and imc STUDIO Monitor in succession, but always at the same time.

Update or parallel installation

The Setup utility checks whether any version of imc STUDIO (imc WAVE) is currently installed on the computer. If so, it can be uninstalled by means of the Setup. An associated confirmation prompt is posted in that case. All user data such as the database remain intact.

The **two versions** can be **installed in parallel** provided that they have differing version numbers (e.g. 5.2 and 2023). The new version can be installed in the same folder (default case: "C:\Program Files\imc"). In this folder, a new subfolder with the new version number is created for imc STUDIO.

In both cases, you are able to **adopt** a variety of **settings** from the old versions. These include the project settings. By contrast, other settings such as the product configuration and the database path need to be set up from the beginning.

Adopting the settings with the help of the existing database (recommended)

When an existing database continues in use, any settings which can be retained will be retained. For a parallel installation, two data bases are needed. Create a copy so that the old imc WAVE version can continue to work with the existing database. A confirmation prompt about making a copy is posted.
See: Update with the help of the existing database 15 .

🔷 Reference	Update imc STUDIO

When using imc STUDIO, please observe the relevant notes about updating:
- Update with the help of the existing database,
- Update without using the existing database.

The subsequent procedure - an overview

Follow the installation program instructions (see: "*Installation step by step* 17 ").
- The installation process first checks whether the **required system software** is installed. If ones is missing, it will be installed automatically.
- After restarting the system, the selected products are installed.
- After the installation is concluded, it is possible to start imc LICENSE Manager directly to activate your license.
- Once the license has been activated, imc WAVE is ready for use.

Uninstalling

Un-installation is performed via the menu item "*Windows-Settings*" > "*Apps & features*".

🔷 Reference	See also

- Recommended Virus Scanner Settings 32
- Changing Languages and Installing Additional Languages 31

3.2.1 Update with the help of the existing database

When an existing database continues in use, any settings which can be retained will be retained. This includes all experiments.

If you wish to run multiple versions of imc WAVE or maybe restore an older version at a later time, create a copy of the database.

> ⓘ **Note**   **The database**

It is impossible to use the imc WAVE database by both versions in parallel.

- If the same path is selected in the new imc WAVE version, the database is used automatically. When loading old experiments, a note is posted in the logbook that the **experiments belong to an older version. Once saved, they can no longer be loaded** with the old version.
- If the database structure has been altered, you will be notified of this. A **dialog for performing conversion** appears. This dialog can be used to convert the database and, if desired, copy it first. After the conversion, the entire **database can no longer be used with the old version**.

> ⓘ **Note**   **Using new pages**

- Be aware that the new version provides new functions, such as new or enhanced pages and new menu items.
- **Use of the new pages is recommended, in order for these new functions to be accessible! Please look under "What's new" whether there have been any changes in this regard.**
- User-made columns such as meta data columns are not automatically inserted into the pages. The configurations of these columns, however, is adopted. You can re-insert these columns at the desired position (by means of the Column Chooser).

3.2.2 Notes and troubleshooting

Notes on Windows User Account Control

Do not change the user account
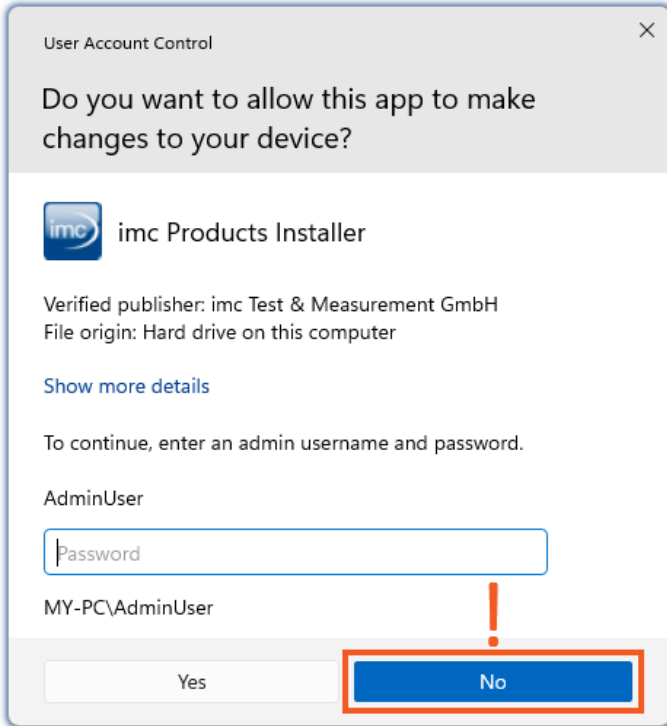
Example of a password request.
Select "No".

With Windows, installation can be started without administrator rights. In this case, the operating system requires selection of a user account and associated password, as shown in the example.

> ⚠ **Do NOT continue with the installation** in this way, otherwise it will be incorrect. **Select "No"**.

Confirm the prompt by the user account control
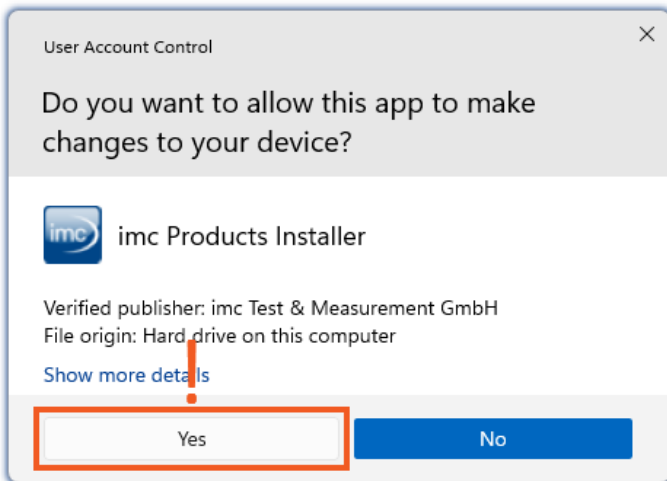
Select "Yes", to start the installation.

When you are logged in to a user account possessing administrator rights, you may receive a prompt by the Windows User Account Control (UAC) to allow changes. Select **"Yes"**.

Notes on the security software

Some virus scanners **prevent correct installation** of imc programs. We are currently aware of this affecting products from the companies McAfee and ESET. In principle, almost any virus scanner can have settings possibilities which prohibit necessary functions during installation.

For installation purposes, certain steps are necessary, such as:

- registration of programs for Autorun
- registration of programs as a service
- running of scripts from the TEMP-folder
- ...

The error profile may include various messages during installation. Or installed programs failing to launch.

In such cases, please contact your administrator to find out whether certain rules can be suspended for the duration of the installation. For any further questions, please contact our tech support 5 .

🔷 Reference	See also

Recommended Virus Scanner Settings 32

3.3 Installation - Step by step

Actual texts appearing in the user interface may differ from those shown in the screen shots, depending on the product configuration (path/version name).

❗ Note

The following installation descriptions deal with several products and components. Not everything which you can activate can actually be used in imc WAVE. For an exact listing of all of imc WAVE's functions, see the Technical Specs sheet.

If you activate components which are not available in imc WAVE, there won't be any negative effects on your program. They may even have some purpose if you use multiple products in parallel.

Download and Installation

The most up-to-date version can be downloaded from the imc website under "*Downloads*" > "*imc WAVE*". Both a complete and a reduced installation package are offered. The reduced installation package is sufficient if you have only purchased imc WAVE. Which products are included is indicated next to the Download button.

Start the download first, and next the file (e.g. "*Installer_imc_STUDIO_2023_R4.exe*").

The Installer unpacks the installation files. Subsequently, it independently starts the actual installation. Select an appropriate folder into which to unpack the files. The system's default suggestion is the Desktop.

❗ Hinweis	Installation files

The unpacked files can be deleted or saved once installation is completed. You can also use the unpacked files for installation at a later time. You do not necessarily need the Installations-exe file.

Installation language settings
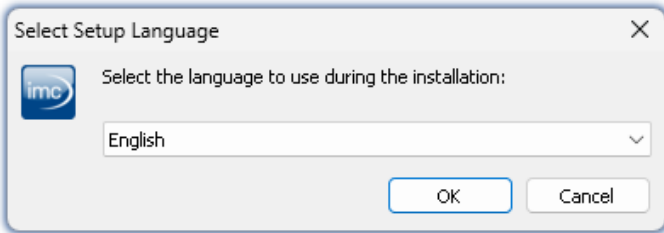
Selecting the language during installation

After starting installation, a window appears in which to select the installation language.

Performing installation
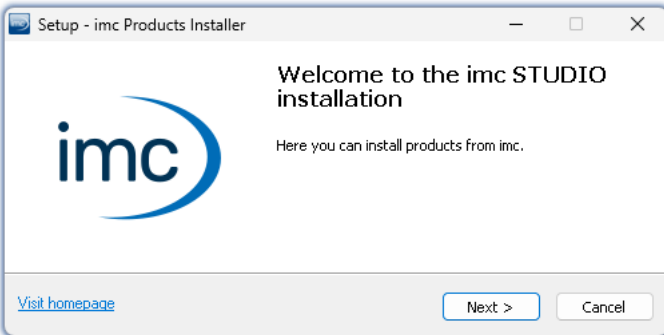
Installation setup welcome page

The installation setup then starts in the language selected.
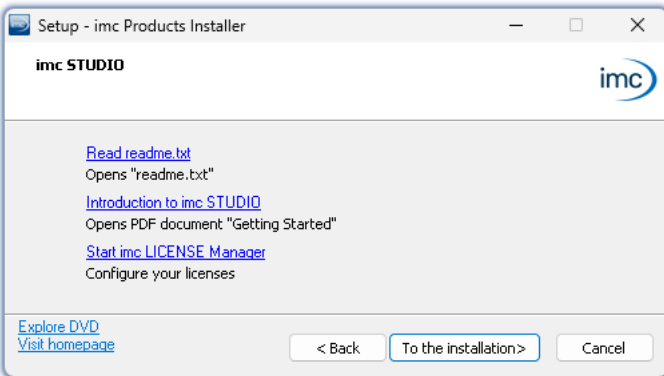
Before starting installation

On the installation setup's next page, you are offered the following choices:

- open the "*Readme*"-file,
- open the "*Getting Started*"-document,
- separate installation of imc LICENSE Manager and
- display of the installation medium contents.
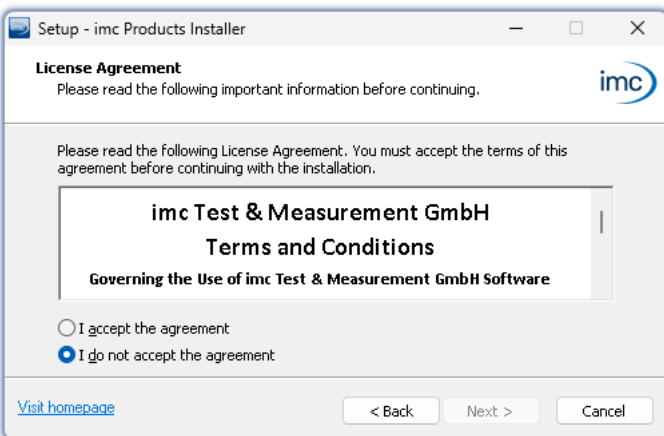
License agreement

You must accept the license agreement to continue the installation.

imc WAVE - Getting Started, Doc. Rev.: 7.0 - 2024-04-15
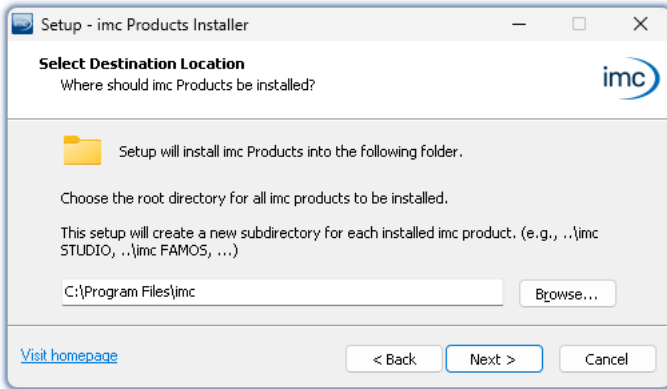
Entering the installation path

The next step is to select the installation folder. Under this folder, a separate subfolder will be created for each imc product (e.g. imc STUDIO 2023). It is recommended to end the associated pathname with "*\imc*".

3.3.1 Select the products / Installation type

Now you can select which components should be installed. There are three types available:

- "*Full functionality for 30-day demo*" : hereafter called "*Demo*"
- "*Typical functionality incl. imc STUDIO Professional*" : hereafter called "*Typical*"
- "*User-defined* 21 "

For the "*Demo*" and "*Typical*" installation types the installation settings are already configured. If you need further settings choose the "*user-defined* 21 " installation type.

> "*User-defined*" gives you the ability to affect all installation settings.

Installation type	Beschreibung
Demo	Use the installation type "*Demo*" in order to test the full scope of **imc STUDIO** and/or **imc WAVE** for 30 days. No other products which require a password will be installed.
Typical	Use the installation type "*Typical*" in order to install the **Professional edition** of **imc STUDIO** including all necessary components. No other products which require a password will be installed. imc WAVE and imc STUDIO Monitor **are not** installed.
User-defined	Use the installation type "*User-defined*" if you wish to **configure the individual products**. With this type, it is possible to install **password-protected components**. Further, you can install and configure additional imc products such as **imc FAMOS**. Note that some components can require a separate license.

> ⚠ Note
>
> In order to install imc WAVE, you must choose the installation type: "*User-defined* 21 " or "*Demo*"!

> ⚠ Note   imc WAVE reconfigure afterwards
>
> Regardless of which variant of the installation is selected, when imc WAVE is installed, all components are included. This way, after successful installation it is possible to adapt the imc WAVE configuration at any time by means of the "*product configuration* 25 ".

Products	Demo	Typical	User-defined	Description
				● : included ○ : optional
imc LICENSE Manager	●	●	●	Managing the licensing (internal functions, does not appear in the list)
imc Shared Components	●	●	●	Proving common components of the imc products, such as the curve window (internal functions, does not appear in the list)
Required system components	●	●	●	System components require using of imc products.
imc SENSORS (1)			○	imc SENSORS is a database application for administering and editing sensor information. Applicable with devices of the firmware group A (imc DEVICES).
imc STUDIO Developer (Demo) (2)	●		○	imc STUDIO is modular software platform handling all aspects of modern measurement technology from simple data acquisition to sophisticated test configurations.
imc STUDIO Professional (3)		●	○	
imc STUDIO any edition (3)			○	
imc STUDIO Monitor (3)			○	imc STUDIO Monitor makes it possible to connect with one or more measurement devices, particularly for the purpose of monitoring the instantaneous readings. Data can be viewed and edited live on multiple workstations. It is based on imc STUDIO and is installed as a separate instance of imc STUDIO.
imc WAVE (Demo) (2)	●		○	imc WAVE is a software package for NVH (Noise Vibration and Harshness) analysis. It is based on imc STUDIO and is installed as a separate instance of imc STUDIO. It can be equipped with multiple, separately licensed analyzers.
imc WAVE (3)			○	
Firmware and driver package imc DEVICES	●	●	○	Package of device drivers and firmware required by imc STUDIO and imc WAVE for devices of the firmware group A (imc DEVICES - e.g. CRONOS family, C-SERIES, SPARTAN, BUSDAQ).
Firmware and driver package imc DEVICEcore	●	●	○	Package of device drivers and firmware required by imc STUDIO and imc WAVE for devices of the firmware group B (imc DEVICEcore - e.g. ARGUS*fit*, EOS).
imc FAMOS Enterprise (Demo) (2)	●		○	imc FAMOS is a program for analyzing, evaluating and documenting measurement results.
imc FAMOS Reader (3)	●	●	○	
imc FAMOS any edition (3)			○	
imc Format Converter	●	●	○	Converts imc measurement data to other formats such as EXCEL and ASCII.
imc Documentation	●	●	○	Installs the documentation on the selected products. If the checkmark is removed, it is not possible to open the documentation via the software.

1: imc SENSORS requires a password for installation.

2: The associated Demo license must be activated after concluding installation by means of imc LICENSE Manager, otherwise it is not possible to start the product. Once the demo trial period has elapsed, use the product configuration |25 to covert the product to the license you have purchased.

3: The associated license must be activated after concluding installation by means of imc LICENSE Manager, otherwise it is not possible to start the product.

When you select "*Demo*" or "*Typical*", the start of the installation follows immediately (see: "*Starting the installation* |24 "). By contrast, if you select "*User-defined*", the installation is first configured |21 .

3.3.2 User-defined

The installation variant can be configured in detail. Based on your selection of components desired, different installation steps are displayed.

Selecting components
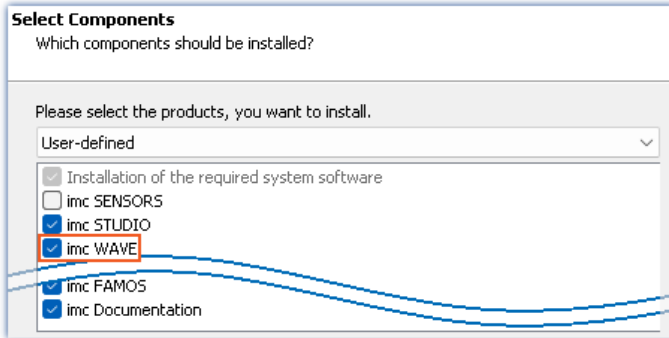
Selecting User-defined installation

Once you have selected the installation type "*User-defined*", it is possible to select/de-select the desired products in the box at the bottom.

Activate imc WAVE here!

imc STUDIO and imc STUDIO Monitor, as well as imc SENSORS are not required for the purpose of operating imc WAVE.

Required system components
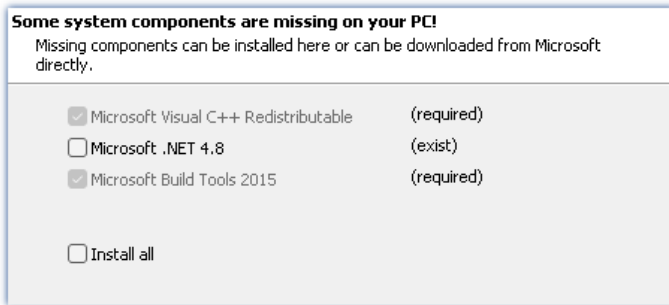
Required system components (example)

In the next step, the system components which the products selected require are displayed, along with a note about which are already installed on your system. It is also possible to re-install any already installed components. Which components are missing/present depends on the system and it update status, so that the illustrations are intended as an example only.

Configuring imc Shared Components
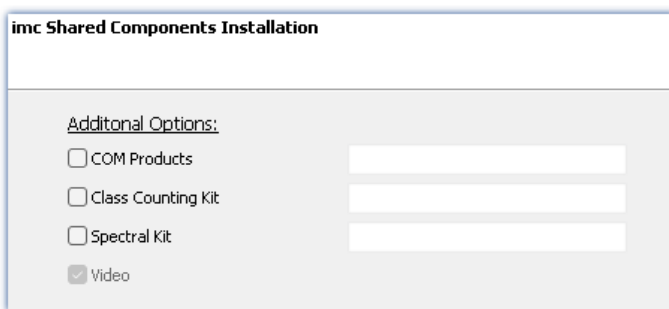
Configuring imc Shared Components

In this installation step, it is possible to install password-protected components of imc Shared Components.

Option/Component	Description
COM Products	The imc COM programming interface is a system integration tool
Class Counting Kit	Function library for imc COM products
Spectral Kit	Function library for imc COM products

Password for imc SENSORS
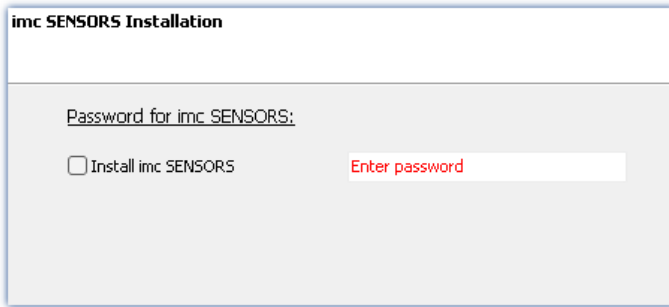
Password prompt for imc SENSORS

If you have selected imc SENSORS, you are prompted to enter the password prior to installation. But if you do not wish to install imc SENSORS, de-select it here.

Configuring imc STUDIO
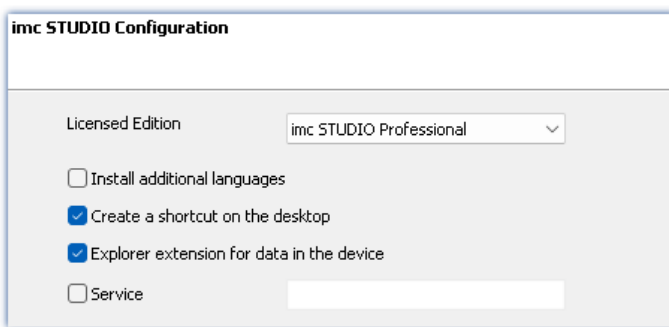
Configuring imc STUDIO

It is possible to make settings for your licensed product edition here. In consequence, later product configuration 25 can be omitted.

Option/Component	Description
Licensed edition	**Information on the editions** is provided in the "*Technical data sheet*" for imc STUDIO.
Install additional languages	With this option, imc WAVE is installed in all available languages. (This will substantially prolong the installation procedure).
	Please be aware that some functions may require the other languages. For instance, foreign-language parameter sets can only be imported if the associated language is installed.
	If this option is deactivated, English language is installed plus the language of the operating system, if available. If needed, all other available languages can be installed at a later time (see the section "*Installing additional languages* 32 ").
Create a shortcut on the desktop	Program starting links can be created on the Desktop.
Explorer extension for data in the device	Access to the device hard drive via the Windows-Explorer.
	for devices of the firmware group A (imc DEVICES)
Service	Service support. Install this component only if requested by our tech support.
	for devices of the firmware group A (imc DEVICES) and group B (imc DEVICEcore)

Configuring imc FAMOS

Configuration of the imc FAMOS installation

In this step, you configure the imc FAMOS installation. Select the editions you wish to install. Note that all editions except the *Reader*-edition require a license.

Follow the Assistant's instructions and select your preferred language for the help files and example files like projects, sequences and dialogs. Select any optional components which you wish to install along with imc FAMOS. Additionally, a folder for sample files is needed.

Reference		**imc FAMOS editions**

More detailed information on the imc FAMOS editions is provided in the imc FAMOS manual.

Once all products have been configured, the installation can start.

3.3.3 Starting the installation
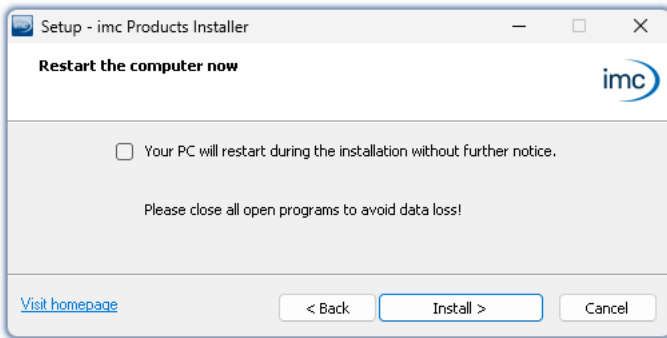
Concluding the installation setup and starting installation

Before the installation, a **system reboot** is performed. For this reason, first **close any running programs** before continuing!

Confirm the reboot by means of the checkbox and then continue (button: "*Install*"). Initially, the required system components are installed. Subsequently, the PC reboots automatically.

⚠️ **Warning**   **Windows user account**

After restarting, **be certain to log in with the same user account** with which you started the installation process. Using a different user account can cause failure of correct installation of the components.
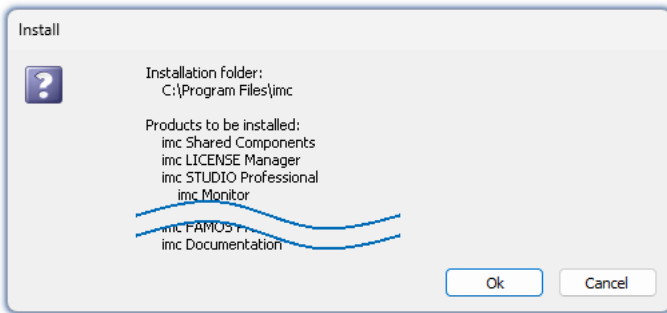
List of components to install, following restart (example)

After logging in, the actual installation of the products begins. You are presented with a list of which components are to be installed, which you can confirm by clicking on "*OK*".

The figure shows an example; the actual dialog may appear differently depending on your respective previous selections.

Next, installation of the individual imc products begins.

ℹ️ **Note**   **Disabling the system start**

While installation is running, the operating system is disabled from starting again, meaning that no other programs can be started.
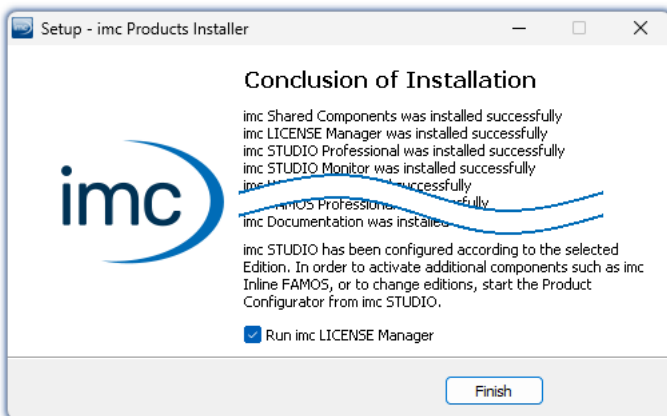
Concluding installation

When installation is finished, the following message is posted.

Next, you can start imc LICENSE Manager in order to activate your license. It is also possible to start the imc LICENSE Manager later via the Start menu.

3.4 Product configuration / Licensing

Licensing (imc LICENSE Manager)

The software licenses are managed with "*imc LICENSE Manager*". After concluding installation, you can start imc LICENSE Manager directly in order to configure your license (e.g. by means of the Windows Start menu: group "*imc*" > "*imc LICENSE Manager*"). If imc WAVE is started without an appropriate license having been configured, the product configuration program opens, from where it is also possible to start imc LICENSE Manager.

Follow the instructions of the imc LICENSE Manager. imc LICENSE Manager offers a separate documentation. Start imc LICENSE Manager and click on "*Help*".

Changing the product configuration

imc WAVE is a preconfigured product. The product configuration is set permanently to ensure optimum functioning. In **accordance with your respective license**, you may be able to **activate the analyzers**. Upon first starting, you are automatically guided to the product configurator by a dialog.

In order to **modify the configuration** at a later time, expand the title bar ▼ , open the context menu and click in the menu on the symbol 📦 .

The product configuration assistant now opens. You are now able to change the configuration. Follow the instructions and close the assistant.

After completing the configuration, you must close and restart imc WAVE to apply the new settings.

3.5 Start

Start the software by means of the associated desktop icon or via the Start menu.

Further, as part of installation an **icon is set up on your desktop** - depending on your choice during installation ⌐17⌐.

If no icon was set up, then open the Windows Start menu. There you find the group "*imc*" and in it a link to start the product.

If product configuration / licensing ⌐25⌐ is missing, the Product configuration starts automatic.

Before you can use imc WAVE, you need to perform a one-time configuration of the software. The various license-based analyzers must be activated via the product configurator. Only after this step, imc WAVE can be started correctly.

Splash screen

Next, a splash screen appears, indicating that software components are being loaded. Depending on the installation and the PC capacity, this could take some time.

*Loading the software
components after start*

Homepage - Start page

By default the Homepage is shown when the software is started. The Homepage shows certain functions, depending on the particular product, as buttons. After the first installation, the "**Homepage**" may appear as shown in the example below:
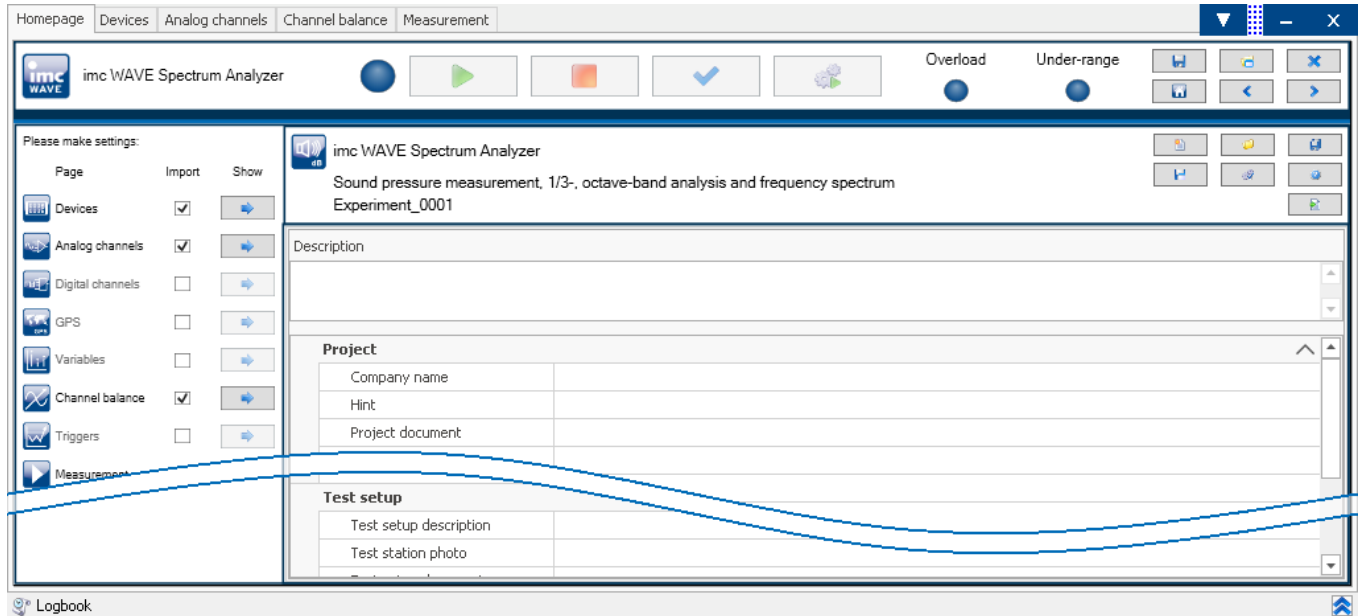
Start page (example Spectrum analyzer)

Changing analyzers

imc WAVE always starts in one of the available analyzers. The Homepage displays which analyzer is in effect. If you do not have a license for the started analyzer you will be notified via dialog.

To change analyzers, create an experiment in a different analyzer ( ), or open an existing experiment ( ).

3.5.1 Device Connection / Network / Firewall

To use an imc measurement device, imc WAVE must set up a **connection via a network** (mostly LAN). Details on the network settings are presented in the chapter "*Setting Up - Connect the device* 36".

Firewall

The firewall used might **prevent** establishment of a **connection** between the operating software and the measurement device. If the software is unfamiliar to the firewall, then a corresponding prompt usually appears upon **accessing the network**. This happens, for example, after starting the software and upon first accessing the device (e.g. in a device search). Some firewall programs can also block access to system and hardware-components.

In all cases, **correct operation** is only possible if the **connection is not blocked**. The following programs are usually affected:

Program	Default path
imc STUDIO: imc.Studio.exe	C:\Program Files\imc\imc STUDIO...
imc DEVICES: imcDevices.exe	C:\Program Files (x86)\imc\imc DEVICES...
imc DEVICES Service: imcDevicesService.exe	C:\Program Files (x86)\imc\Shared

For operation on LAN, it is sufficient to **enable "*Private networks*"**. Enable this access type. You may wish to read the operating instructions for your firewall, and / or ask your administrator / IT-department.

Windows Defender Firewall: Unblocking is performed automatically upon installation.

3.5.2 Important settings

Options

Before beginning to work with imc WAVE, you can change essential settings, such as the **folder path where the experiments are saved**.

You can change the folder path in the options (under "*Project Management*" > "*HDD settings*"):

Action	Page
Options ( )	Homepage

> ⓘ **Note**   Reading and writing access rights are required
>
> Please note that this setting will apply for every user of imc WAVE. Each user must possess reading and writing access rights for the specified folder path.

Checking and modifying the time zone

Applicable to devices belonging to the firmware group A (imc DEVICES): In order to assign a definitive point in time for all measured data, a specific time zone is set for all imc devices used. The factory setting is "***UTC+01:00***". If applicable, modify the time zone setting. For this purpose, the "*Devices properties*" dialog contains an entry "*Device time and synchronization*" > "*Time zone*".

Action	Page
Dialog: Device options > Device Properties	Devices

3.5.3 Command line parameters

Opening an Experiment file

An [experiment file](#) 51 (e.g. MyExperiment.imcstudio) can be opened directly in the Windows Explorer by double-clicking. This starts a new instance of imc WAVE and opens the experiment file. The same procedure also applies for linkages to experiment files, for example files on the Desktop.

Experiments can be started with command line parameters. To do this, create a link to an experiment file and enter the desired parameter.

```
["imc STUDIO-Installation"] "Experiment-File" [/fullscreen] [/do[StartMeasurement]]
[/do[StartSequencer]]
```

["imc STUDIO-Installation"]	Open Experiment with a specific imc STUDIO installation (optional)

In order to open an experiment file with a particular installation of imc STUDIO (imc WAVE), extend the link with the respective installation's name. For example:
```
"C:\Program Files\imc\imc STUDIO 2023\imc.WAVE.exe"
"imcDB://DB_WAVE\SpectrumAnalyzer\MyExperiment"
```
The experiment file `MyExperiment.imcstudio` is started in the imc STUDIO installation (imc WAVE).

"Experiment file"	Experiment to be loaded

Mandatory entry. Opens the experiment entered with the imc STUDIO installation (imc WAVE) which is set up as the default program under MS Windows. Mostly this is the last imc STUDIO version installed, or imc STUDIO Monitor/imc WAVE, if this component was installed along with it.

One possibility is to specify the path in absolute terms:
```
"C:
\Users\Public\Documents\DB_WAVE\SpectrumAnalyzer\MyExperiment\config\MyExperiment.imcSt
udio"
```

Another way is to specify it in reference to the name of the database and of the project (the appropriate database folder must be selected):
```
"imcDB://DB_WAVE\SpectrumAnalyzer\MyExperiment"
```

/do[StartMeasurement]	Starting the measurement (optional)

In order to start the measurement automatically upon opening an experiment file, The experiment file is opened with the parameter `/do[StartMeasurement]`.
```
"imcDB://DB_WAVE\SpectrumAnalyzer\MyExperiment" /do[StartMeasurement]
```

3.5.4 Error causes upon starting

Corrective actions for when the logbook opens with error messages directly upon starting imc WAVE.

Message	Corrective action
No matching DEVICEcore found.	In the product configuration, the **firmware imc DEVICEcore** is activated. However, no appropriate firmware has been found or installed. By default all firmware products are activated. You can take the following corrective actions: • install the appropriate imc DEVICEcore-firmware. This is only necessary if you wish to use a device belonging to this firmware group. • deactivate the component "*imc DEVICEcore device adapter*" in the [product configurator] 25.
Error while initializing the plug-in "imcDevices V2.x Adapter" ...	In the product configuration, the **firmware imc DEVICES** is activated. However, no appropriate firmware has been found or installed. By default all firmware products are activated. You can take the following corrective actions: • install the appropriate imc DEVICES-firmware. This is only necessary if you wish to use a device belonging to this firmware group. • deactivate the component "*imc DEVICES V2.x Adapter*" in the [product configurator] 25.
Could not load file or assembly 'imc.Studio.Plugins.DevSetup.Sensors.Stubs.dll' ...	In the product configuration, the component **imc STUDIO Sensors** is activated. However, no appropriate **imc DEVICES firmware** was found or installed. You can take the following corrective actions: • install the appropriate imc DEVICES-firmware. This is only necessary if you wish to use a device belonging to this firmware group. • deactivate the component "*imc STUDIO Sensors*" in the [product configurator] 25.
The loaded Project-settings are from an older imc STUDIO version. If you save these settings, an older imc STUDIO version would not be able to read them correctly.	With every Version/Revision, new enhancements and other changes are introduced. In consequence of these changes, some saved projects may become no longer compatible with older versions. Make sure that no older version of imc WAVE needs to access the database.
More than one DEVICEcore installation found in STUDIO installation directory.	Solution: Uninstall the older imc DEVICEcore version.
Could not connect to the Guardian process. Some functions (e.g. delete measurements) will not work.	The Guardian process is not running. Please start either the Guardian- or WatchDog-service. ⚑ For more info, see the section "*Guardian*"

3.6 Info / Version information

imc WAVE is an application for imc STUDIO. imc STUDIO is used as a base and consist of multiple components. In order to see which components are included in your package, expand the toolbar ▼ and open a context menu out of the toolbar. Click in the menu on the symbol 🛈 Then a pop-up window appears displaying the product names and details on the components:
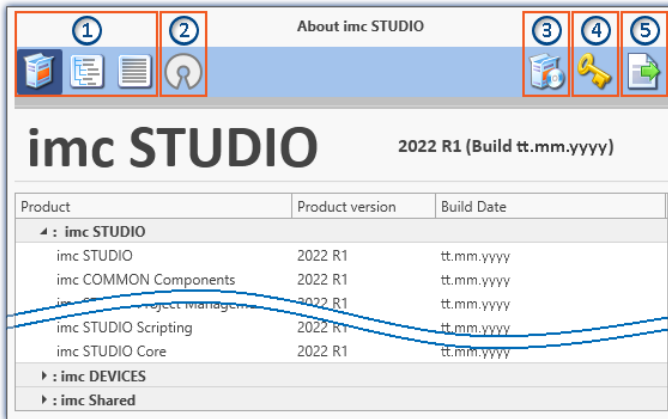
Version information (example)

With the buttons on the left side ①, you can change the list's depth of detail and how it is sorted. Additionally, you will receive all copyright notes regarding "*Open source software*" (🔘) ②.

With the buttons on the right side, you can start the assistant for the [product configuration] 25 ③, start the [imc LICENSE Manager] 25 ④ or export the product selection ⑤.

While performing the export, you can save the contents as a file in XML format. For inquiries to our tech support, it may be necessary to send it as an e-mail (see also chapter "[*Tech support*] 5 ").

3.7 Information and tips

3.7.1 Changing languages and installing additional languages

Following installation, imc WAVE is available in **English** and, if applicable, in the **language of the operating system**. Additional languages can be installed by selecting the option "*Install additional languages*" in the installation variant "User-defined 21 ".

ⓘ Note	**Observe operation system settings**

- Please ensure that your operating system is set correctly to the display language. Some languages require modifications to be made accordingly. In particular, the "**System locale**" must be set correctly to correspond with the display language.
  Otherwise, with some languages there can be problems with the characters. Languages affected include Japanese, Chinese, Russian, ...

Changing the language

By default, the imc software will start in the same language as the Windows version installed. If this language is not supported, then the English program version appears.

The language can be changed, irrespective of the Windows version. Use the program "*imc Language Selector*". The program is found in the Start menu under the group "*imc*".

ⓘ Note	**Constraints**

Only the imc software's texts are converted. Components which depend on the operating system's language setting are not affected.
Please only use one of the following two languages:
- Default: the operating system's language
- English

Any other selection may cause malfunctioning if the operating system and the imc programs use different languages.

Installing additional languages

If desired, all other supported languages can be installed later (no installation medium is required).

! Note	Which languages are be installed subsequently

In subsequent installation of languages, **all languages supported** are installed. There is **no selection** possibilities.

Step by step

- Administrator rights are required.
- Open the **installation folder** of imc STUDIO (e.g. "*C:\Program Files\imc\imc STUDIO...*"), e.g. with Windows Explorer or by means of the command line.
- There, open the folder "*Languages*"
- Run the file "*InstallLanguages.bat*".
- Wait until the script stops and posts the message "*Failures: 0*". This indicates that the installation has completed successfully.

! Note	Instruction notes

If installation was unsuccessful, the necessary user rights may be missing:

- If "*InstallLanguages.bat*" is called via the **command line**, run the **command line as Administrator** (context menu: "Run as Administrator")
- If "*InstallLanguages.bat*" is called via the **Windows Explorer**, run the **call as Administrator** (context menu: "Run as Administrator")

3.7.2 Recommended virus scanner settings

The presence of many channels can **burden the PC** if a virus protection program scans the data captured. This may cause a **jiggling display** and high demands on the processor.

We strongly recommend **removing imc STUDIO from the virus scan**. Most virus protection programs are able to classify individual programs as low-risk. To do this, please refer to the instructions for your virus scanner.

Low-risk	Default path
Add the programs **imc.Studio.exe**, **imc.Monitor.exe** and **imc.WAVE.exe** to the list of low-risk programs	C:\Program Files\imc\imc STUDIO...
Add the program **imcDevices.exe** to the list of low-risk programs	C:\Program Files (x86)\imc\imc DEVICES...
Add the **database** path along with all subfolders to the list of low-risk folders	C:\Users\Public\Documents\DB

Ensure that its data are not searched for viruses during reading or writing.

⬥ Reference	Installation

See also the installation note: "*Notes on the security software* 17 "

3.7.3 Enhanced installation

Installing projects

You can prepare projects which are automatically included with the installation. E.g., after the installation, special views and experiments will already be available.

- Create a project-export-file (".imcStudioExport") for the purpose. Make sure that the project is exported and not only the experiments (selection). Upon exporting, you can define what the file is to contain. E.g., only the project settings, or also the experiments.
- Save the file(s) on the installation medium in the following path: ..\Products\imc STUDIO\Projects

> Any existing projects having the same name will be overwritten.

Produce an installation medium and run the installation as usual or install from the hard drive.

After the first launch of imc STUDIO, projects are imported into the database.

FAQ

Question	Answer
What happens if the project exists already?	All project settings will be overwritten.
What happens if the project has contents which do not exist in the project to be imported?	All content besides project settings remains intact. E.g. experiments, measured data, metadata, ...
What happens if the project has contents which already exist in the project to be reported?	These will be overwritten. As well, any experiments, measured data, metadata, ... are overwritten.
What happens if there are any other projects present?	These projects remain intact.
What all is imported from the project?	All project settings and any experiments, measured data, metadata, ... the projects contain

Adding your own personal programs

On the installation medium, in the folder "*Products*", create an extra folder for your own product. Save your installation file there. The Installer will now automatically detect the product and offer it for installation.

Optional: By means of an ini-file, you can cause your product to be the default selection in the Product-Selection list.

On the installation medium (on the same level as the folder "*Products*"), create an additional folder named "*Configuration*". There, create a file named "*Setup.ini*". Fill this file with the following text:

```
[SetupX]
SetupX1=<PRODUCT>
```

For <PRODUCT>, insert the name of the folder in which your installation file is located.

3.7.4 Unattended installation - Silent installation

For unattended installation ("*Silent installation*"), certain parameter files (.ini) are required. Create these files by means of a command line call.

`Setup.exe /CREATEINIFILES="<TargetPatch>"`

To do this, proceed as follows:

- Start the installer - e.g. "*Installer_imc_STUDIO_2023_R2_2023-04-20.exe*".
- The installer begins by unpacking the content of the installation medium. Select an appropriate target folder on your hard drive: e.g under "C:\DVD\".
- As soon as the unpacking process has concluded, configuration for the installation begins. Cancel this procedure!
- Start Windows' command prompt ("cmd", "command shell").
- Navigate to the appropriate file path and call the Setup with the following command line (in the example here, the folder is: "S:\DVD\"):

`Setup.exe /CREATEINIFILES="C:\DVD\"`

The frame setup is started and may be configured as desired. When the settings are finished being made, there is no restart, as there usually would be. Instead, at the specified target location, *.ini-files are created which have the following structure:

Main file

DVD/Configuration/Setup.ini

Product files

DVD/Products/$Productname$/Configuration/$Filename$.ini

z.B.

DVD/Products/imc STUDIO/Configuration/imc STUDIO.setup.ini

DVD/Products/imc FAMOS/Configuration/Setup_imcFamos.ini

The ini-files contain the settings which have been made.

Subsequently, the DVD folder can be copied to a data carrier and used for the unattended installation.

Calling the unattended installation

The installation process is called with command line parameters, where "`/SILENT`" causes the silent setup installation to start. The following is an example of a 64-bit system:

`DVD/Setup.exe /Lang=en /DIR="C:\Program Files\imc" /SILENT`

With the additional parameter "`/UNINSTALL=ALL`" the de-installation of all previous versions is inhibited.

If the switch is set to "NECESSARY" only the necessary version are de-installed. When setting the switch to "NONE", no version is removed.

In special cases a de-installation is needed, e.g. if you install the 5.2 R23 to a 5.2 R22. The 5.2 R22 needs to be de-installed.

> ⓘ **Note**
>
> **Creating ini-files in a different folder**
>
> You can also create the ini-files in a different folder. In this case, merge the two folders afterward (not recommended because prone to errors).
>
> **Please always create new ini-files each time**
>
> With any new version, it may occur that new keys are entered in the ini-files. For this reason, create new ini-files for any new version.

4 Setting Up - Connect the device

There are multiple ways to **connect the imc measurement devices with the PC**. In most cases, the **connection via LAN** (local area network, Ethernet) is implemented. See section "*Connecting via LAN in three steps* [37]" for the **quickest way to connect** PC and measurement device.

But there are also other connection types:

- WLAN
- LTE, 4G, etc. (via appropriate routers)

These are described in a separate section: "*Special options for connecting to the device*".

The devices use the **TCP/IP protocol** exclusively. With this protocol, some settings and adaptations for your local network may be necessary. For this purpose, the support of your network administrator may be necessary.

> **🛈 Note**
>
> When **using multiple TCP/IP connections**, e.g. LAN, WLAN and modem, observe the remarks in the section "*Computers with multiple TCP/IP connections*".

Recommended network configuration

The latest and high-performance network technologies should be used to achieve the maximum transfer bandwidth. This means especially 1000BASE-T (GBit Ethernet). GBit Ethernet network devices (switches) are downward compatible, so that imc devices that only support 100 MBit Fast Ethernet can also be operated on them.

The cable length between the switch and a PC or a device should be less 100 m. Use a shielded cable. If the length of 100 m is exceeded, then you have to insert another switch.

If the system is being integrated into an existing network, you must ensure that the minimum data rate can be guaranteed. Under some circumstances, this may require using switches to subdivide the network into separate segments in order to govern the data traffic in a targeted way and thus optimize the data rate.

In very demanding applications, you might consider grouping multiple GBit Ethernet devices via even higher-performance sections lines of the network (e.g. via 5 GBit Ethernet) and to connect these groups to NAS-components, for instance, via these lines.

When such imc devices are included which use network-based PTP-synchronization (e.g. CRXT or CRFX-2000GP), then it is necessary to use network switches which fully support this protocol on the hardware side. Appropriate network components are also available as imc accessories (e.g. CRFX/NET-SWITCH-5) and are then electrically and mechanically fully compatible with the imc systems.

4.1 Connecting via LAN in three steps

The most common case is described below: the PC and the device are connected via cable or network switch. The device's IP address must be set in the PC's address range. Subsequently, the device can be connected with the PC. If a connection has ever been established previously, the software recognizes the device's hardware configuration. In that case, experiment configurations can be prepared without any connection to the device.

Step 1: Connecting the measurement device

To connect via LAN there are two options:
1. The measurement device is connected to an **existing network**, e.g. via network switch. Only with a switch is it possible to run multiple devices.
2. The measurement device is connected directly to a network adapter on the PC (**point-to-point**).

In a LAN, the first case is typically implemented. Modern PCs and network switches are usually equipped with Auto-MDI(X) automatic crossover recognition, so that it is not necessary to distinguish between crossed and uncrossed connection cables. Thus both cable types can be used.

Step 2: IP-configuration

Start imc WAVE. Click the "*Device interfaces*" button to open the dialog for configuring the IP address of the device.

Action	Page
Device options > Device interfaces	Devices

Once the dialog starts, the system automatically searches for all devices in the network. In the tree diagram, all available devices are indicated. If the device appears among the group "*Currently not reachable*" ①, it is necessary to modify the device's LAN-settings. If the device appears among the group "*Ready for measurement*" ②, you can leave the settings as they are or review them.

> If there is any IP-conflict, devices affected will not be listed.

Select the device for making modifications ③.
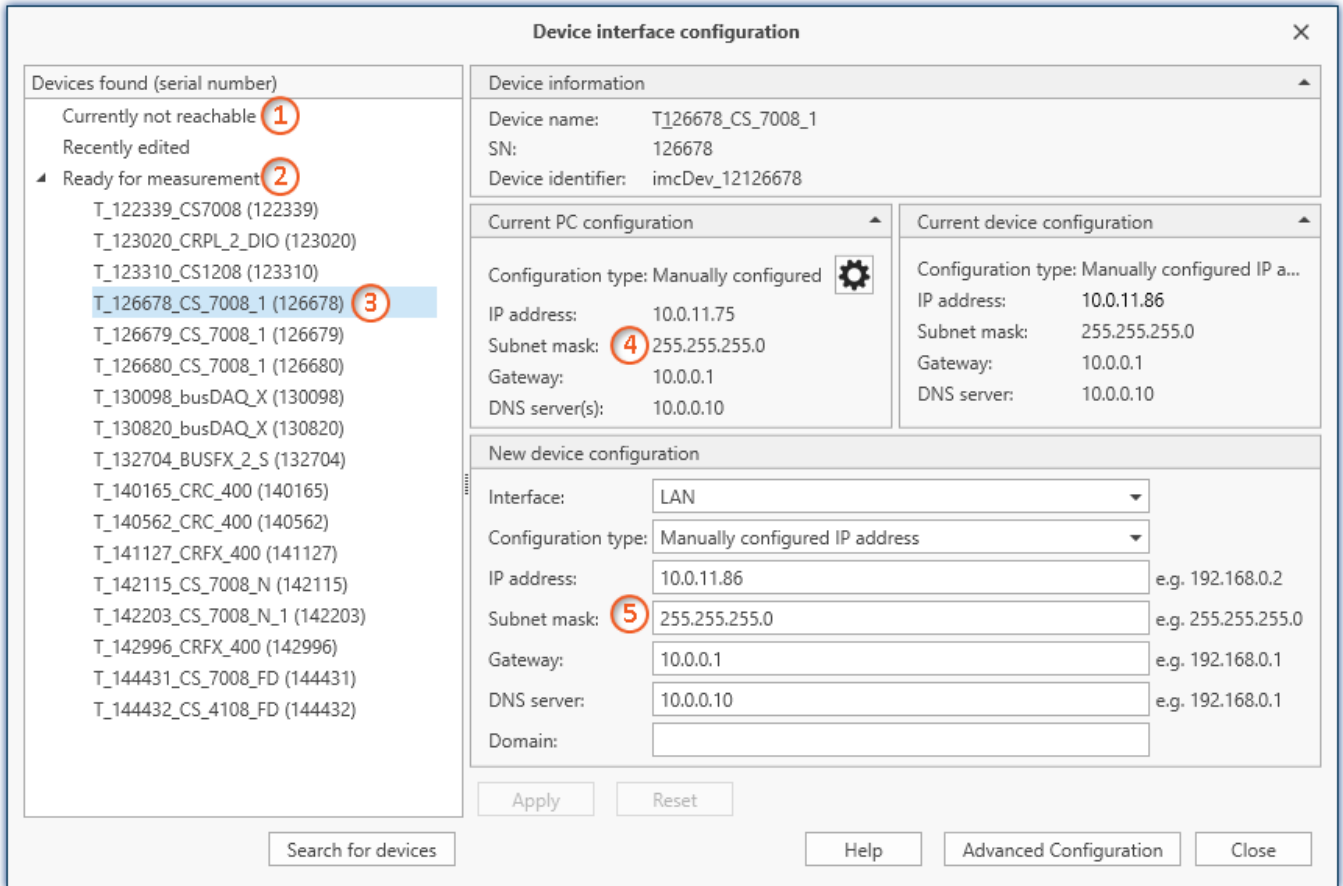
Display of measurement devices found and of the IP address

Set the **IP address manually** if you are not using DHCP. The device's IP address ⑤ must match with the PC's address ④. To conform to the network mask, only the device portion may be different (see example).

💡 Example

In the example shown, the fixed IP 10.0.11.75 with subnet mask 255.255.255.0 is selected for the PC. For measurement devices, any numbers would be suitable which begin with 10.0.11. and then do not contain 0, 75, or 255. The 0 and the 255 should not be used, if possible, due to their special significance. The 75 is the computer's number.

Example for IP settings	PC	Device
IP address	10 . 0 . 11 . 75	10 . 0 . 11 . 86
Network mask	255 . 255 . 255 . 0	255 . 255 . 255 . 0

If the configuration type: "*DHCP*" is used, **the IP address is obtained automatically** from the DHCP-server. If it is **impossible to obtain any setting values** via DHCP, the **alternative values are used**. These could lead to errors in the connection (different networks, same IP addresses, etc.).

If there is a **direct connection** between the device and the PC by a cable, then **DHCP should not be used**.

In order to apply the changes, click on the button "*Apply*". Wait for the device to restart and then close the dialog.

> **⊘ Note**   **Connection via modem or WLAN**
>
> For devices of the firmware group A (imc DEVICES):
>
> If the connection to the device is established via a modem or WLAN, start the program "*imc DEVICES Interface Configuration*" by clicking on the button: "*Advanced Configuration*" (see previous figure). An exact description is found in the software manual chapter: "*Setting Up - Connect the device*" > "*Special options for connecting to the device*".

Step 3: Integrating a device into an experiment

Now you are ready to add the device to the imc WAVE experiment. If your device is unknown to the system, first perform the "*device search*".

Action	Page
Dialog: Device options > Search for devices	Devices

Select the desired device: Once you click in the checkbox "*Selected*" for the desired device, it is ready to use in the experiment (see *Device Search - Known and Selected*).

	Selected	Device name	SN	Device specification
▶	✔	T_124835_C1_1_LEMO_ET	124835	imc C1-1 LEMO
	☐	T_130039_busDAQ_X	130039	busDAQ-X
	☐	T_130311_SPARTAN_U32_CAN	130311	imc SPARTAN

You can also select multiple devices for your experiment.

Now the device is "*known*". After the next program start it is available for selection. For further information, see the documentation on the component "*Setup*".

> **✦ Reference**   **Time zone**
>
> Now check whether the correct time zone is set for the device: see "*Important settings* 27".

4.2 The network

Optimize the network

You should observe the following notes for networks with high data rate, to reduce the risk of a data overflow.
1. The network between switches and PC should be 1GBit/s
2. The actual data rate is decreasing with the number of channels. Avoid unnecessary channels.
3. The RAM buffer should be as big as possible, not "*Auto*".
4. Save only channels you need to the internal disk.
5. Avoid curve window setting that need a lot of performance. Choose scroll mode. Avoid the rezoom function after a long measurement duration. Don't set the sample points to symbols. Try to find a curve window configuration, that shows no bucking.
6. Observe the [recommended virus scanner settings](#) 32 ! It would check every sample written to the hard drive. That takes most of the performance of a PC and the hard drive.
7. Check the processor and network load with the PC task manager

Using a second network

To avoid disturbing data transfer between devices units and PC's, a second network using a second network card per PC can be set up. This second network can be used for transferring data between the PC's.

Example of a Complex Network

Until now, we have only considered networks consisting of a PC and n imc devices units. However, any arbitrary combinations are possible.
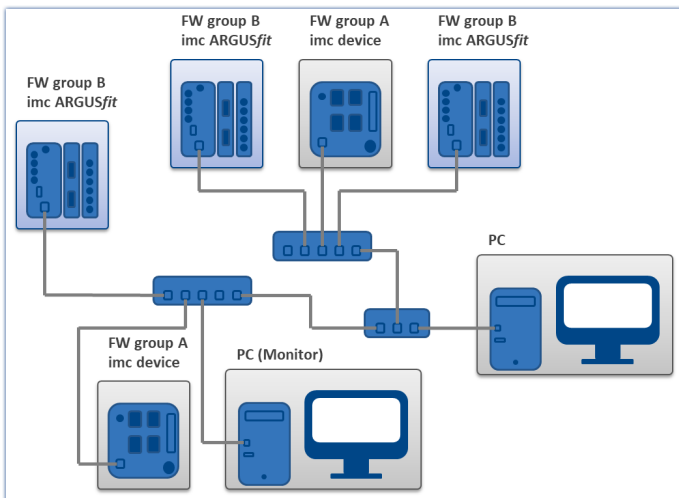
Monitoring

The PC on which imc WAVE is installed is declared as the Master-PC, which configures the measurement device.

For devices belonging to the firmware group A - e.g. CRONOS family, C-SERIES, SPARTAN, BUSDAQ:

Various other clients can access the measuring device via the network (e.g. via imc STUDIO Monitor or imc LINK or, it is set up accordingly, using a browser via imc REMOTE WebServer).

The well-known network restrictions are also valid here. In particular, it is impossible for more than one person to write to the same file. Furthermore, it is impossible for one person to open a file while another writes to it. In general, all network restrictions that apply to files also apply to the individual Devices units.

In consequence, the software con prevent multiple users from configuring the same device.

4.3 Firmware version

imc DEVICE*core* and imc DEVICES as a driver package for imc WAVE

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

- imc DEVICE*core*: For devices belonging to the firmware group B - e.g ARGUS*fit*, EOS
- imc DEVICES: For devices belonging to the firmware group A - e.g. CRONOS family, C-SERIES, SPARTAN, BUSDAQ

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

The software only works with devices having the right firmware. Upon the connection/preparation, the versions are compared. If they don't match, the <u>firmware update</u> 41 is carried out.

> **! Note**   **Parallel firmware versions**
>
> **imc DEVICE*core*:** The associated firmware- and driver package ships with the software used, and is installed in the software's installation folder. Any other installations are not recognized and thus cannot be used.
>
> **imc DEVICES:** It is possible to work with multiple groups of imc DEVICES simultaneously and in parallel. In special cases, this may be relevant or even recommendable, particularly in conjunction with the use of multiple devices. Additional notes on this subject are provided in the chapter: "*Associated Firmware (imc DEVICES)* 45 "

4.3.1 Firmware update

Every software version comes with matching firmware for the hardware. The software only works with devices having the right firmware.

Once the program connects up with the unit, the device's firmware is checked. If the software version doesn't match the device's firmware version, you are asked if you want to perform a firmware-update.

> **! Note**
>
> The firmware update is only required if the software was obtained as an update. If you obtained your hardware equipment together with the software, no firmware update is necessary.

> **⚠ Warning**   **Do not interrupt the firmware update!**

Be absolutely certain to observe the following:

1. Under no circumstances should the device or its power supply be deactivated during the firmware update!
2. The network connection may not be interrupted. Use a cable connection, not WLAN!

Firmware update - imc DEVICES

ⓘ Note	Firmware and driver package

The following description applies to devices of firmware group A (imc DEVICES) - e.g. CRONOS family, C-SERIES, SPARTAN, BUSDAQ.

Depending on the device type, the following components are loaded automatically: Interface-firmware (Ethernet, modem, ...), booting program, amplifier firmware, firmware for the signal processors.

The dialog for the firmware-update looks like this:
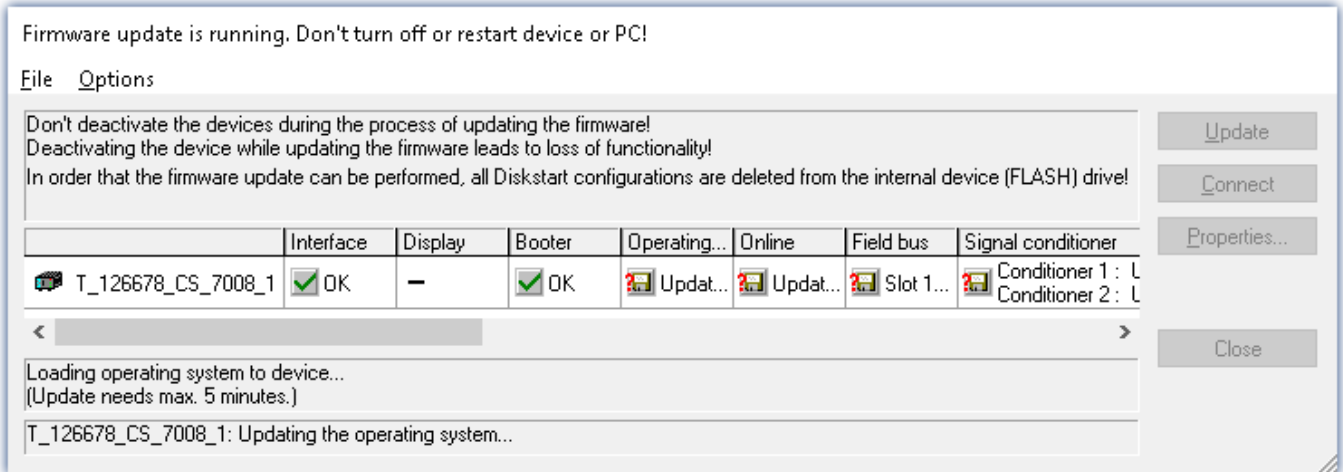
Start of the firmware update (example of a single device)
The state of the components of the firmware is diaplayed in the list.

Component	Description
Interface	Interface-Firmware (Ethernet)
Booter	Start-up program for the device upon switching-on
Operating system	Device operating system
Online	Online-functions and hard drive controller
Display	Operating system of the connected displays
Fieldbus	Fieldbus interfaces (e.g. CAN etc.)
Signal conditioners	Amplifiers

The following symbols for the individual firmware components appear in the list:

Symbols	
💾	not current
✔	firmware conforms to current standards
⚠	error occurred during update procedure
—	this option is not available on the device

If no status indicators are displayed, no connection could be made to the corresponding device.

The duration of the update depends on the number of amplifiers (can last up to several minutes). You will be informed on the progress.

You are notified when the firmware setup concludes successfully, as shown below:
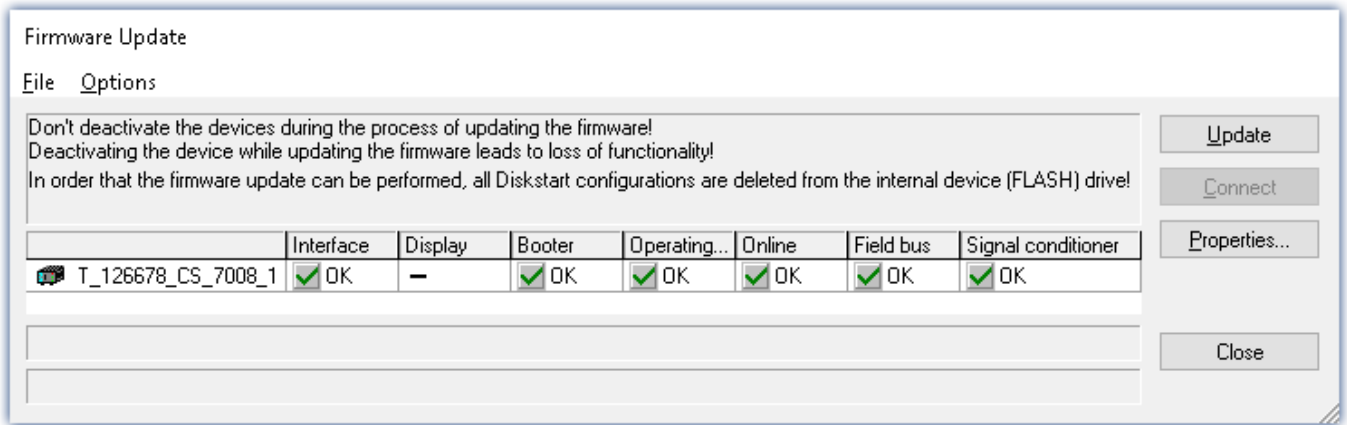
Conclusion of the firmware update (example of a single device)

Choose "*Close*". The device can now be used with the product software.

> ⚠️ **Warning**   **Be sure to observe in case of error**

- For a variety of reasons, the firmware update sometimes does not conclude properly, for example due to interruption of the power supply. For instance, the "handshake signal" at the end of the procedure may be missing. In this case, no measurement channels would be displayed initially. However, restarting the device and its software and performing the firmware update again usually restores everything to normal. It may be necessary to call the menu function "Update all components" in the Firmware update dialog's Options menu. This scenario only results in permanent damage in the most rare cases, and it is very worthwhile to repeat the procedure before sending a device in for repair.

- Behaviour under error condition, Windows cuts off the network connection without the user's knowledge; but this can be prevented using the PC's Control Panel.
  Background: During the firmware updates there is no data transfer for a few minutes and thus no network activity; Windows detects inactivity of the connection and the following mechanisms are set in motion:

  a) Windows' energy saving mode switches the LAN adapter off, consequently interrupting the network connection!

  b) Windows switches to the next LAN adapter if there is one (some PCs have multiple adapters in order to, for instance, to access services in parallel that are accessible via separate networks.)

  c) Other scenarios are feasible, e.g. if switches are activated, which can also respond to missing data traffic.

If an error message is posted during the firmware update, leave the device on and contact our tech support 5. The firmware update may be continued with guidance from the tech support.

> ℹ️ **Note**

Firmware logbook

The "*File*" menu offers a function for working with the firmware log file. Every action taken during a firmware update plus any errors which may occur are recorded in a log file. This log file can be displayed with menu "*File*" > "*Show log file*".

Firmware update - imc DEVICEcore

<table>
<tr><td>⚠ Note</td><td>Firmware and driver package</td></tr>
</table>

The following description applies to devices of firmware group B (imc DEVICEcore) - e.g. ARGUS*fit*, EOS.

Upon the connection/preparation, the versions are compared. If they do not match, the next dialog notifies you about this, and indicates both which version is being used and which version is required.
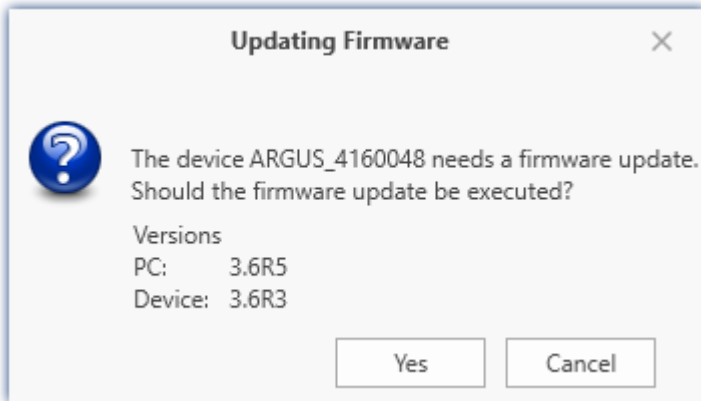
When you click "*Yes*", the firmware update starts. The duration of the update depends on the number of amplifiers (can last up to several minutes). You will be informed on the progress.

If the firmware update was successful, the dialog will close automatically after a few seconds. Subsequently the device can be used with the device software.

<table>
<tr><td>💬 FAQ</td></tr>
</table>

What to do in case of an error occurring in a firmware update?

Answer: When a firmware update fails to run correctly, the last active firmware is restored. The device remains operational by means of the previous installed firmware. Repeat the procedure, and if the repeat procedure also fails, please contact our tech support.

What is an optional update?

Answer: In some cases, a firmware update is not mandatory. In such cases, the update is available to you as "*optional*". However, we still recommend performing the update, since every update not only implements improvements, but also fixes any bugs. Nevertheless, with the new version of imc WAVE, you are able to work with the device running the old firmware edition, if you choose.

4.3.2 Associated firmware (imc DEVICES)

If multiple firmware versions are installed on the PC, then a defined version must be selected for each device.
The selection strategy is set in the Options: "*Setup*" > "*Device options*" > "*Selection of the imc DEVICES version*".

Action	Page
Options (⚙️)	Homepage

Option	Description
Selection of the imc DEVICES version	If multiple imc DEVICES versions are installed on the PC, a specific version must be selected for the operation of each device. This option controls the selection strategy.
	If only one imc DEVICES version is installed, this setting has no effect.
	• **Manual:** With "**Manual**", the system always asks which firmware version to use when device are selected or an experiment is loaded.
	• **Automatic:** "**Automatic**" avoids firmware updates. The version currently running on the device is used preferentially.
	• **Always use latest:** With this selection, the most current firmware version compatible with this imc WAVE version is always used.

> 🛈 **Note**   **Use of older firmware**
>
> Please note that a new firmware version not only contains new functions, but also reflects resolved issues. These changes only take effect if the device is also using the new firmware.

FAQ

Question: Which firmware versions support my imc WAVE version?

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

imc WAVE version	assigned firmware / version group	additionally compatible
5.2	2.10, 2.11, 2.13	
2022	2.15	2.14
2023	2.16	2.14, 2.15
2024	2.17	2.14, 2.15, 2.16
…	…	

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

As of version 2022, the applicable rule is: the assigned version group and all **predecessor groups going back to 2.14** are compatible with the imc WAVE-version used.

Question: Can devices in the same experiment use different firmware versions?

Answer: Yes. If multiple devices are used, each one may use a different firmware version. Prerequisite: The imc WAVE-version used supports the firmware versions.

Question: Can I install a new firmware version without changing the imc WAVE version?

Answer: Yes. Prerequisite: The imc WAVE version used supports the firmware version.

Question: Is there a way to determine what firmware the device is using?

Answer: Yes.
- On the Setup page: "*Devices*", a column can be added: Device firmware
- In the Device properties.

5 Demo Experiments

Getting a feel for imc WAVE

It is possible to download demo experiments from the imc-homepage (Spectrum Analyzer). The experiment contains measurement data which provide a sense of how imc WAVE can be used.

You can view the pages and play back the measured data without needing to add any additional device. And you may use the experiment for your own purposes, if desired.

Notes on the Demo-experiments are available on our webpage in the Download area for imc WAVE: https://www.imc-tm.com/imc-wave/demo-experiments/

6 "What is..." - Terminology

imc WAVE is experiment-oriented and is equipped with a simple operating interface. A experiment is begun by selecting an analyzer. The analyzers provide appropriate settings options and automated analysis capabilities. There are additional pages used by all the analyzers in common, such as channel and device settings, trigger settings, etc.

Below, an overview of the most important points is presented.

Data acquisition

A variety of imc measurement devices are available for the purpose of data acquisition. A list of all available devices appears in the technical data sheet. The devices are operated and configured by means of the user interface.

Online data-processing

The result data are computed whenever possible during a running measurement.

Offline data-processing / Further evaluation (only Spectrum Analyzer)

In order to subject the signal data to further evaluation, it is possible to perform offline-analysis. The saved measurement readings are the raw data for the re-calculations. In this way, data already recorded can be re-evaluated by changing the analyzer settings and running the function "Play back measured data" in the Data Browser.

Display on the Panel pages

Data analysis is already under way during data capture. For display and control purposes, various Panel pages are available. Each evaluation page contains various Widgets for display of measured data, such as the curve window. In addition, a variety of graphic analysis techniques is available, from comparisons all the way to 3D waterfall and color map representation.

Thus you have the ability to set up additional pages with curve windows.

Experiment: How to create a experiment?

imc WAVE saves the settings in so-called "_experiments_ 51". The first step towards performing a measurement is **to create a new experiment** (_Homepage_: Button 🖼️).

In the subsequent dialog,
- select the analyzer desired and
- enter a name under which to save the experiment.

Analyzers are available for selection in the list on the left side. You can use whichever analyzers you have enabled by obtaining a license.

Once all information has been entered and confirmed by pressing the "OK" button, the experiment is saved under the selected name. You can now proceed to configure the experiment and perform measurements.

What pages are available?

Each analyzer has its own special pages for configuration and analysis. Some pages exist in all of the analyzers, e.g. those for configuration of the devices and channels. The pages are displayed with tabs. Which tabs are present can be set on the homepage.

Page	Description
Homepage 55	Sets which pages are visible. Configuration of the meta-information.
Devices 58	Configuration of the measurement device: **device selection**, **data storage**, **synchronization**, timed start, ...
Analog Channels 59	Configuration of the **analog input-** and **output channels**, as well as of the calculated channels (**virtual channels**). The analyzer's settings (**Spectrum Analyzer**).
Digital Channels 59	Configuration of the **digital input-** and **output channels** and **incremental counters**.
GPS 59	Configuration of the **GPS channels**.
Variables 59	Configuration of various existing variables: Display variables, Ethernet bits, Virtual bits, Process vector variables, ...
Channel balance 60	The **balancing settings** for the analog input channels.
Triggers 59	Configuration of the **triggers** in order to perform targeted starting and stopping of channels.
WAVE Analyzer	The analyzer's settings (**Structural Analyzer**).
Measurement	The analysis options and display settings for the measured data.
Optional pages	Additional customized pages.

Each of the items pertains to a particular experiment. When you switch to a different experiment, the data for the new experiment are opened.

What is an analyzer?

Formally, an analyzer transforms the input signals into output signals by means of an algorithm. The output signals are then available for display and evaluation.

An analyzer is selected when creating a experiment and is permanent for the duration of the experiment. It is a fixed property of a experiment; it cannot be changed within a experiment. Depending on the analyzer selected, different settings and processing steps are available.

In the context of imc WAVE/imc STUDIO, analyzers are administered as so-called "*Projects*".

How is a new page created?

To create a new page, click on the button 🗐 on the "*Homepage*". Under "*Import Panel page*", select the checkbox for the desired page. Enter a name and click on "OK". Subsequently, a new tab will appear for the new page, having the name you entered.

On the page "*Command batches*", you can create and run your own command sequences. There are a few choices of commands available for the sequence. The sequences can be run manually or be appended to events.

Using the page "*Customized page*" you can select how many curve windows you wish to see within the page ("Number of windows"). Depending on how the page is partitioned, you now have one to four curve windows on your page. The partitioning and size of the curve windows is permanent.
Each of these curve windows can be configured individually.

By means of the dialog called by the button: 🗁, you can manage your own pages, e.g. change the name or delete pages. The pages are associated with a particular experiment; in order to be able to use the pages also in other experiments, you can export and import them.

Curve windows

A curve window is where the measured data are graphically displayed. There are numerous options for modifying the appearance and content of curve windows. All of the curve window's settings can be reached via the context menu.

The curve windows of the pre-defined pages are configured according to their associated analyzer in such a way as to display the most important data. However, you are able to customize the curve windows according to your requirements.

Displaying measured data in the curve window:
If you have not yet performed any measurement, perform "*Process configuration*" (✔). This provides empty measurement data sets which you can display.
Select the curve window's menu item "*Configuration*" > "*More Channels*". In the dialog which then appears, you can add data from the right-hand list by means of drag&drop into the left-hand list. All waveforms listed at left are displayed in the curve window.

How to start a measurement?

After creating a experiment, selecting and configuring the display, and configuring the analyzers (see below), measurement can be prepared and started.

The analyzer, which is the heart of imc WAVE, computes the desired output channel signals from the data provided by the input channels. These channels can be displayed and stored along with the input channels. To activate the output channels, select the analyzer's configuration dialog and make the appropriate settings.

Once you have made all settings, you can start the measurement by clicking on the button ▶.

7 Experiments, projects and the database

This chapter describes the interdependencies among the "*database*", "*projects*" and "*experiments*".

Experiment

The experiment includes a record of all settings needed for generating the measurement data as well as viewing and evaluating them. The actual measured data are saved with the "experiment" to which they belong.

You can create a variety of experiments to accomplish a corresponding variety of measurement tasks. imc WAVE always works with exactly one experiment and all changes are saved to it.

Among others, the following settings are saved:

- the experiment file (filename extension: "*.imcStudio"),
- measurement files and metadata,
- various backup files and administration files

Among other things, the experiment file contains all the settings configured in the main windows and in the Setup-Assistants.

Each experiment has a unique name which is set when it is <u>saved</u> 54 .

Measurement data

By default, the measured data are saved in the Experiment folder. They belong to the experiment. You specify the data structure in the Device-settings under "*Storage*" (Setup page: "*Devices*" > "*Storage*").

Project

In the context of imc WAVE/imc STUDIO, analyzers are administered as so-called "*Projects*".

A project is primarily a collection of various experiments.

Some options and configurations are not saved along with the experiment. For instance, they might be saved along with the project and apply to all experiments belonging to the project. In some cases, you can define what has to be saved where. E.g. when generating variables, you can change the validity scope and, for instance, save it not just for that experiment but for all experiments in the project.

Whatever is saved at the Project level (and thus not with the specific experiment) is correspondingly denoted at the locations affected.

Database

The database is the data repository for imc WAVE. Here, the projects and their associated experiments are saved. The database does not have its own settings and configurations.

The folder path for the **database can be freely selected** (in the Options under: "*Project Management*" > "*HDD Settings*").

Ribbon	View
Extra > Options ( )	All

Option	Description
Database folder	Here you set where the "**Database**" is to be saved.
	The database is not user-dependent. Note that every user who is set up in the system has writing and reading rights for this path.

Database conversion

If the database structure has been changed, you are subsequently notified. One way this can happen is as a result of updating to a new version.

A **conversion-dialog** appears. You can convert the database or have it copied beforehand. After the conversion, the entire **database can no longer be used with the older version**.

Databases are not downward compatible.

In the upper region, the reason why the database does not fit with the current version is noted. E.g., the database may be too new or too old. In the list below, all databases found in the folder selected are listed. The "Status"-bar contains information on the database.

The following approaches are available:

Approach	Description
Select an existing database	Select the appropriate database and click on the button "*Apply*".
	If it is necessary to **convert the database**, an additional dialog appears. Here, the user is prompted to decide whether to **use the database under a new name**. If you choose:
	• **no:** the existing database is converted. It can no longer be used with the older version.
	• **yes** (*recommended*)**:** the database is copied. Enter a name for the new database. Now you have two databases. You will have a backup copy and can continue to use the old database with the old version.
Create a new database	Click on "*Create new*". Enter an appropriate name for the database. It will be created in the folder selected (parallel to any already existing databases).
Change the database's folder	Click on the button "..." next to where the folder is indicated. Select an appropriate folder.
	Here, select a folder where the database folder is to be created later. Not the database itself. E.g. the default folder: "*C:\Users\Public\Documents*". The database will be created in this folder, e.g. "*DB*".

Creating one's own files on an experiment - in the folder "Meta"

You can **create your own files on the experiment**, such as metadata, imc FAMOS-sequences, info-files. To do this, use the **folder: "*Meta*"** in the experiment path. If you save or export the experiment under a different name, all files from the folder "*Meta*" come along with it.

The folder "*Meta*" is now ignored in all components.

- The content is not recognized as a measurement although containing measured data. This means that there is no entry in the Data Browser.
- Interval saving does not delete the folder. When the number of intervals is limited, the folders of measured data are deleted in succession once the specified count has been reached. The folder "*Meta*" is ignored, even when the folder contains measured data.

7.1 Dialogs: Project and Experiment

The Project Management dialogs are described below.

The dialogs following the functions "**New Experiment**", "**Save As**" and "**Open**" are structured similarly. The dialog is described below on the basis of "*Open experiment*" as an example. Not all dialogs feature the complete scope of functionality.
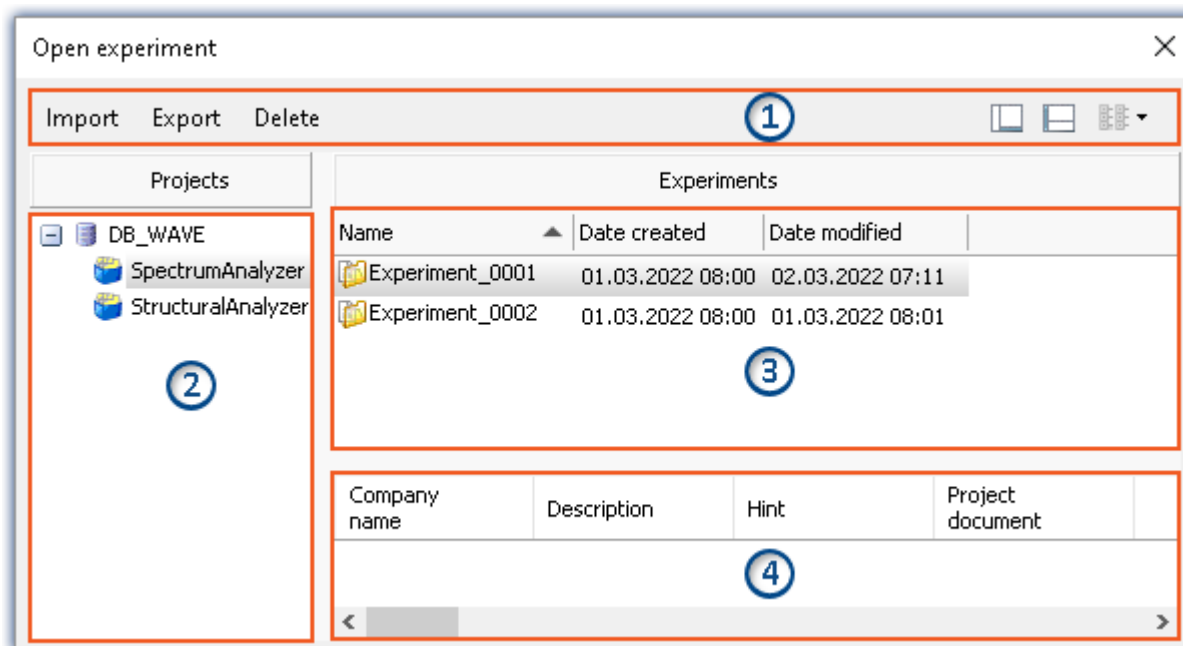
Example: Open experiment

The dialog is subdivided into four regions (from top to bottom):

1. Menu bar
2. List of all projects
3. List of all experiments in the selected project
4. Linked metadata information belonging to the selected experiment

By default, the regions 1 and 3 are displayed; the others can be activated if desired.

Region 1: Menu bar

Function	Description
Import	Imports elements from a file in the selected entry. The file can contain multiple elements. You can select either all or individual elements for import. Additionally, the target name can be changed. Be sure to first select the target correctly.
Export	Exports the selected entries to a file. Individual or multiple experiments can be exported to a file. ⊘ Manually created folders are not included with the export. The exception is a folder in the experiment path named: "_Meta_ 53⌐".
Delete	Deletes the selected entries. Individual or multiple experiments can be deleted. If you select delete an experiment with saved measurement data, a prompt appears for confirmation that you wish to delete the data.
⊟ / ⊟	Show/Hide Region 2 (list of all projects)
⊟ / ⊟	Show/Hide Region 4 (metadata information)

Regions 2 and 3: List of all projects / experiments / experiment templates

In these two regions, the projects/the experiment are listed. When you select a project, all elements of the project selected are displayed in the region at right.

Region 2 is only displayed if the region is shown (via the menu button: ⊟).

Region 4: Linked metadata information

The metadata saved with the selected experiment are displayed in this region. When an experiment is saved, the metadata can be saved automatically along with it.

Only shown if the region is shown (via the menu button: ⊟).

7.2 Creating/Saving/Copying an experiment

Each experiment has an identifying name which is specified when it is created/saved. Each name may be used only once per project.

When you create an experiment, or when you save an experiment under a new name, you are asked for a name. In this case, enter a unique name.

Action	Description
New Experiment	All changes since the last save are discarded if a new experiment is created.
Save experiment as	When you save an experiment under a new name, a new experiment having the current settings is created. • Measurement data from the existing experiment are not transferred along to the new experiment (exception: if the experiment was previously never saved; in that case a prompt appears to ask whether to include these measured data). • Files from the folder "Meta" 53⌐ are copied and are available in the new experiment.

8 The User Interface

Homepage

After a successful start of the software the homepage will appear. The following screenshot displays the homepage of the Structure Analyzer:
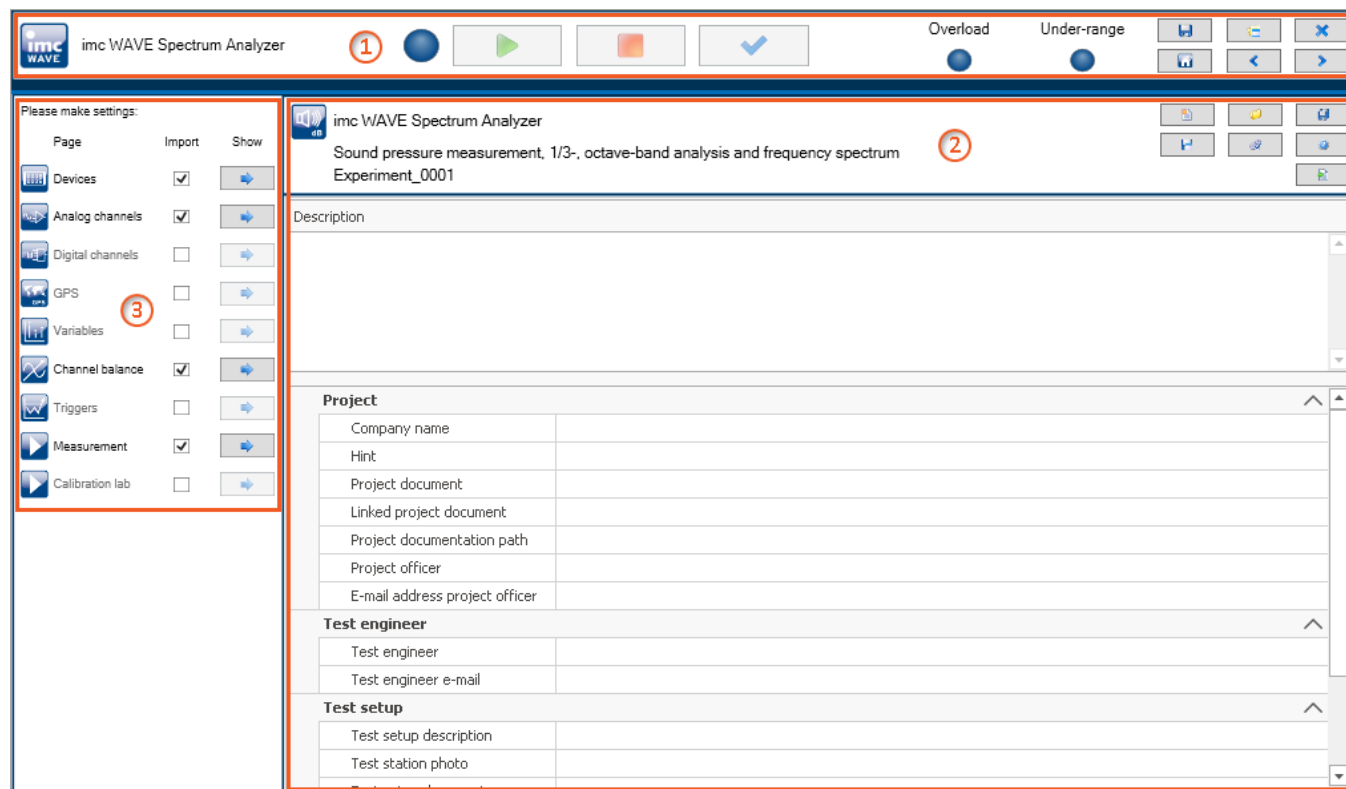
Homepage

The window is subdivided into three regions:

Region		Description
1	Header	All pages have a header. It provides information and buttons affecting the measurement process.
2	Information and experiment-control	Here you can enter meta-information for documentation purposes. By means of the buttons, you can, among other things, create new experiments, or load others, and open the online help.
3	Page display and selection	Here you can activate pages 49 and browse through them.

Region 1 is displayed by default. The others (2 and 3) are structured differently on each page. The respective structure is described separately.

Brief description of buttons in the header

Button	Description
	Navigates to the homepage.
	Saves the current experiment.
	Opens a dialog for creating and managing additional pages.
	Exits imc WAVE.
	The measurement is started for all devices.
	The measurement is stopped for all devices. Displayed while the measurement is running.
+	**Process configuration** The current configuration is inspected for errors and made available to all components. For this purpose, no connection to the device is required. There are cases where certain settings are possible to make during operation while not being actually supported by the respective device type. In such a case, a corresponding error message will be posted (see chapter Logbook). The symbol for the experiment's Configuration Download to the device appears when the CTRL-key is pressed while the focus is on the header or the mouse is positioned over the buttons. This process downloads all settings affecting the device to the measurement system. The measurement starts immediately afterwards.
	Plays back a recorded measurement.
	Navigation: Browses one activated page backward.
	Navigation: Browses one activated page forward.
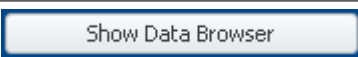
Brief description of buttons in the Homepage

Button	Description
	Browses to the respective page, e.g. Analog Channels. Displayed if the page is activated.
	Activates/deactivates a page. Pages which are not needed or not to be displayed can be hidden in this way. Thus, unintended changes can be prevented.
	Creates a new experiment 54
	Opens an existing experiment
	Saves the current experiment under 54 a new name
	Saves the current project
	General options
	Open user's manual

Button	Description
	Meta-information which has been entered is transferred. The information is saved in variables in the Data Browser.

Title bar- Function overview

The fullscreen window has its own title bar (menu). A **variety of functions** can be called from this menu.

	The menu includes various buttons. It can be **expanded and moved**.
	By means of this button, you can expand the menu to reach **additional functions**.
	Using this button, you can **move the menu**, in order to access **elements located behind** it. When you move the mouse pointer over this button, you obtain a special cursor (◀ • ▶). While holding down the mouse button, you can change the menu's position within the top edge.
	This button **minimizes the program**.
	Thus button **closes the program**.
Data Browser	This button Show Data Browser causes the free-floating Data Browser to be shown.

Additional functions can be reached via the context menu or via the button ▼ in the expanded menu.

Menu item	Description
Login	Logs in a user
Logout	Logs a user out
Info	Opens the dialog with version information
Product Configurator	Opens the dialog for product configuration

8.1 Setup panel pages for device configuration

Devices

The page "*Devices*" enables you to perform the first steps toward selecting, configuring, and making settings for your device.
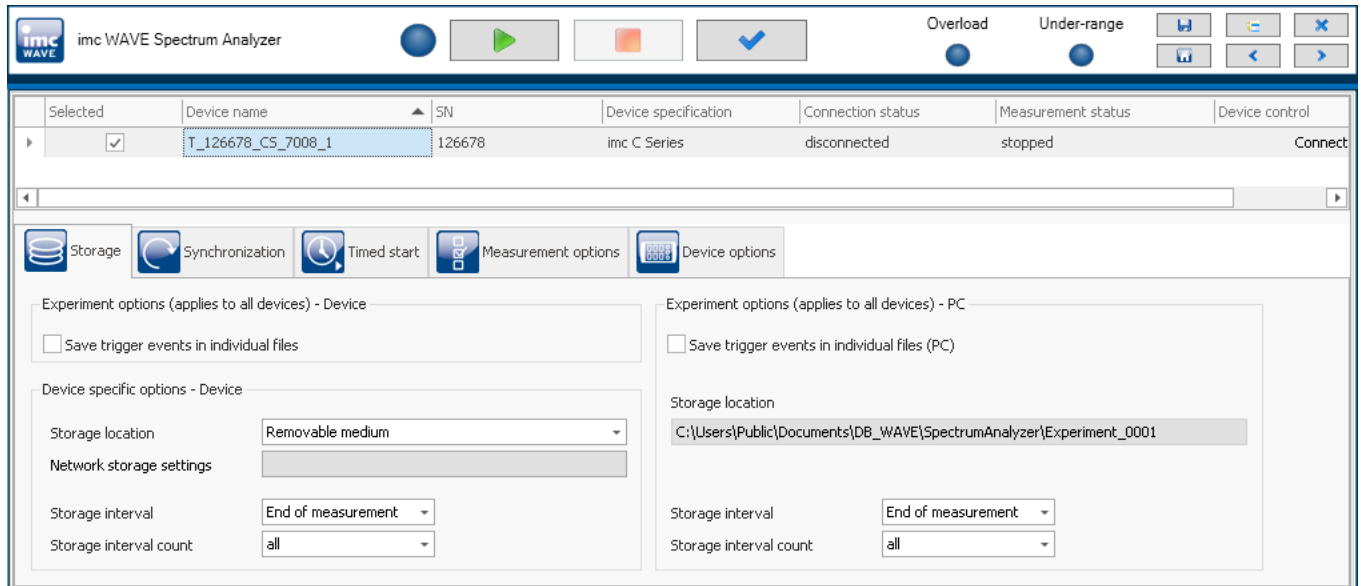
Device search

Once the software has started, all dialog pages on the Devices page, except the "*Device options*", are hidden unless a device is selected. Thus you can continue directly with the device search. An introductory notification appears.

Button: "*Search for devices*". In a device search, the system searches through the network for all appropriate devices. Subsequently, all devices found are listed.
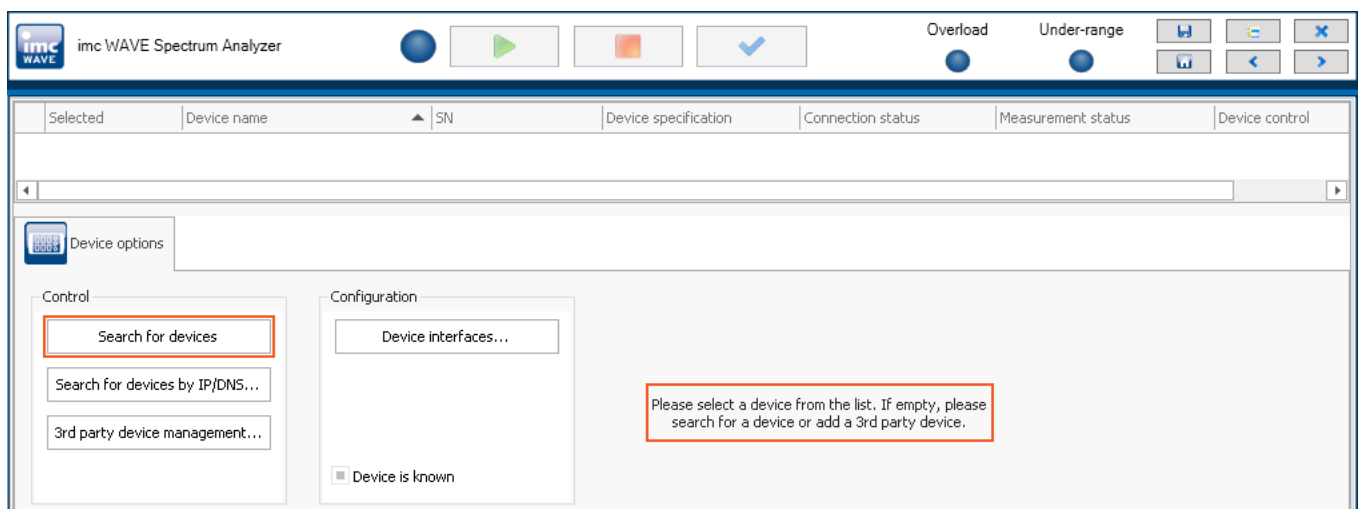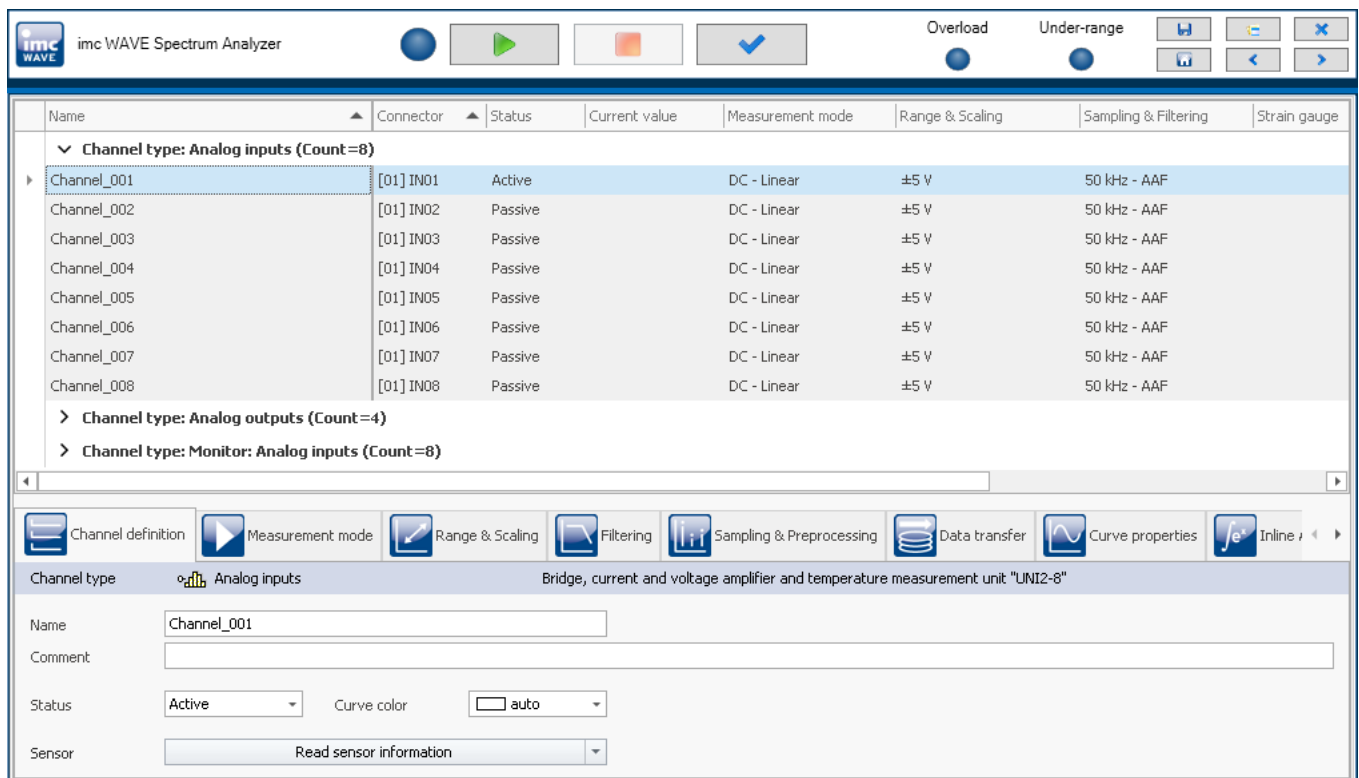
	Reference	Configuring a measurement device - Setup-pages

In the imc WAVE documentation's chapter "*Configuring Devices*", you will find a detailed description of the settings: Storage, Synchronization, Timed start, Measurement options and many more.

Analog/Digital channels, GPS, Variables, Triggers, ...

On these pages, you can make channel-specific parameter settings and configure the triggers.

Example: Analog channels

Reference

In the imc WAVE documentation's chapter "*Setup - Device configuration*", you will find the detailed description of the individual Setup pages which are displayed here.

Channel balance

On the page "*Channel balance*", channels can be balanced.

In the imc WAVE documentation's chapter "*Channel balance*", you will find the detailed description of the Balancing-pages.

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Contact imc

Address

imc Test & Measurement GmbH
Voltastr. 5
13355 Berlin

Phone: (Germany):   +49 30 467090-0
E-Mail: info@imc-tm.de
Internet: https://www.imc-tm.com

Tech support

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

Phone: (Germany):   +49 30 467090-26
E-Mail: hotline@imc-tm.de
Internet: https://www.imc-tm.com/service-training/

imc ACADEMY - Training center

The safe handling of measurement devices requires a good knowledge of the system. At our training center, experienced specialists are here to share their knowledge.

E-Mail: schulung@imc-tm.de
Internet: https://www.imc-tm.com/service-training/imc-academy

International partners

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

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