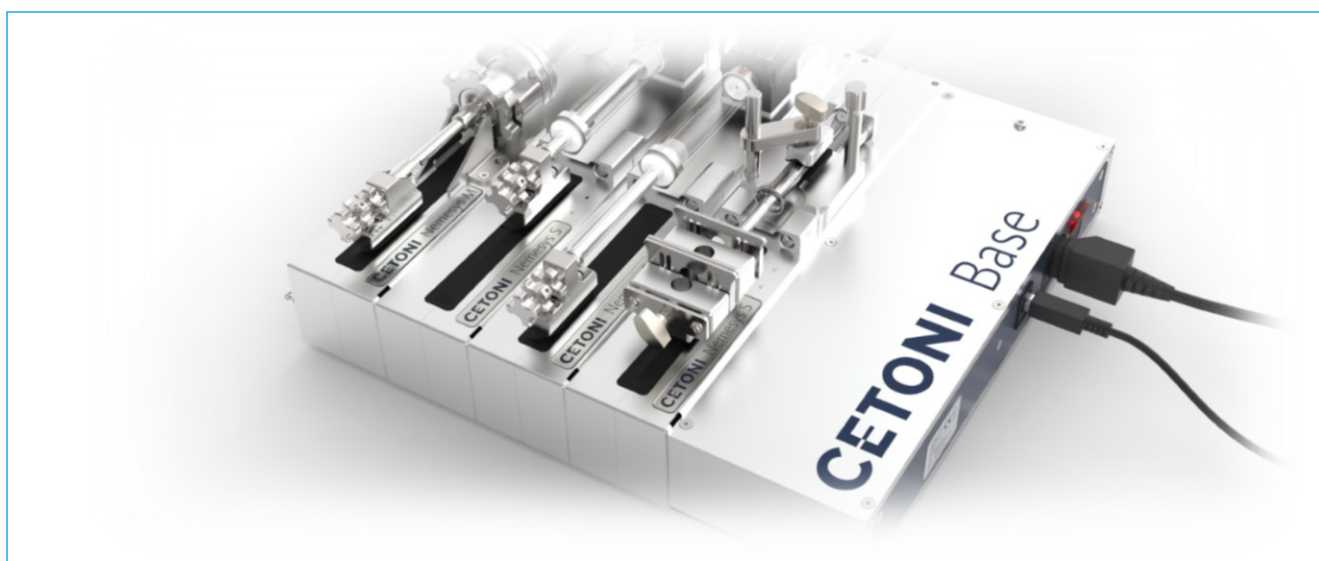




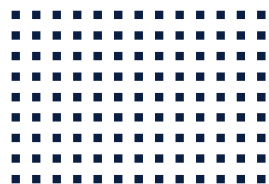
# CETONI

## CETONISYSTEM

### Hardware Manual – General Part



ORIGINAL INSTRUCTIONS 1.02 – AUGUST 2023



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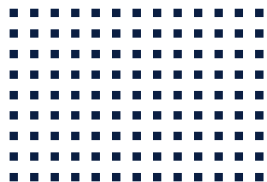
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## 1.2 Change History

REV	DATE	CHANGE
1.00	15.01.2020	Initial creation of CETONI System Manual from Qmix Hardware Manual - General Part
1.01	04.05.2020	Cover image updated
1.02	14.08.2023	Images updated, Safety information updated, complete revision of the procedure for Nemesys S and Nemesys M

# 2 Introduction

## 2.1 Foreword

Thank you for choosing a CETONI product. With this user manual we would like to support you in handling the CETONI products and devices. If you have any further questions or suggestions, please do not hesitate to contact us directly.

Both individual devices and the complete system may only be put into operation after thorough reading of this manual. We wish you much success in working with the CETONI system.

## 2.2 Symbols and Keywords Used

The following symbols are used in this manual and are designed to aid your navigation through this document:



**HINT.** Describes practical tips and useful information to facilitate the handling of the software.



**IMPORTANT.** Signifies important hints and other useful information that may not result in potentially dangerous or harmful situations.



**CAUTION.** Identifies a potentially harmful situation. Failure to avert this situation may result in damage to the product or anything in its proximity.



**ATTENTION.** Indicates a potentially dangerous situation. Failure to avert this situation may result in slight or moderate injuries or property damage.

## 2.3 Norms and Guidelines



CETONI GmbH declares under its sole responsibility, that all devices manufactured by CETONI comply with the health and safety requirements of the relevant European directives.

## 2.4 Application Purpose

### 2.4.1 General Description of the Device

The CETONI system is a modular system of different devices for performing various processes and applications in laboratories.

### 2.4.2 Intended Use

The devices of the CETONI system are intended for the use described in the corresponding device manuals.

### 2.4.3 Reasonably Foreseeable Faulty Application

A use for applications distinct from the intended purpose can lead to dangerous situations and is to be omitted.



**CAUTION.** The unit must not be used as a medical device or for medical purposes.

### 2.4.4 Safety Advice



**IMPORTANT.** Please read this manual, the corresponding module manuals and the associated software manual carefully and completely before operating your system.

The safety of the user and a failure-free operation of the devices are assured only if original parts are used. Only original accessories may be used. Warranty claims will not be accepted for damage due to the use of alien accessories or expendables.



The devices have been developed and constructed in such a way as to largely rule out hazards due to its intended use. Nevertheless, you must observe the following security measures in order to exclude any remaining hazards.

- CETONI GmbH points out the responsibilities of the operator for the operation of the devices. The laws and regulations of the place of installation must be observed while operating the devices! To ensure a safe work routine, operators and users must assume responsibility for adhering to regulations.
- The devices must not be used as a medical device or for medical purposes.
- Only operate the devices in safety cabinets.

There is a risk of crushing on moving parts of the devices! There is a risk of burns or frostbite on possibly hot or cold parts of the devices! Various hazards may be caused by the media you use.

- The CETONI system is designed to work in fluidic systems, which fall within the scope of Article 4 Para. 3 of the Pressure Equipment Directive 2014/68/EU.

This means that the system may not exceed a maximum volume of 1 liter. With the use of fluids from Group 1 according to Article 13, Para. 1 of the Pressure Equipment Directive 2014/68/EU, the maximum allowable system pressure is 200 bar. For fluids from Group 2 it is 1000 bar. If different, product-specific values for the maximum pressure are given in the section "Technical Data", these values must be complied with. Regarding the maximum operating temperature, the specification from the section "Technical Data" must be observed.

CETONI GmbH is not liable for consequences that may arise if the user expands the system by peripheral devices, such that one of the values or both values are exceeded.

It is the user's responsibility to become familiar with the mentioned Pressure Equipment Directive and to comply with the prevailing requirements.

- Before each use of the devices, the user must ensure that they are in good functional safety and in proper condition. The devices may only be operated if they are in faultless condition. Damaged devices, cables, pipes or connectors must be removed from the system immediately and sent for repair or be replaced.
- The user must be familiar with the operation of the devices and the software.
- Cables must be laid in a way that avoids any risk of stumbling.
- The operation of the devices in explosive atmospheres or with explosive substances is prohibited! The devices are not designed in such a way that the occurrence of sparks and possibly an explosion caused by them can be excluded.

- Wear suitable personal protective equipment when operating or handling the devices with corrosive, hot or otherwise hazardous substances.
- Only carry out assembly work on the devices when they are depressurized. Equip your application with safety measures, such as a release valve, to be able to relieve the pressure in the system in the event of an error or malfunction.
- Transportation, storage or operation of the devices below 0°C with water in the fluid passages may cause damage to the modules.

## 2.4.5 Measures for Safe Operation

### 2.4.5.1 ELECTROMAGNETIC EMISSIONS

The CETONI system is intended for use in any type of facility, connected directly to the public power supply network that supplies buildings used for domestic purposes.

### 2.4.5.2 ELECTROSTATIC DISCHARGE

Floors should be made of wood, concrete, or ceramic tiles. If the flooring is made of a synthetic material; the relative humidity must be at least 30%.

### 2.4.5.3 ELECTRIC DISTURBANCES

The quality of the supply voltage should be to the standard of a typical business or hospital environment.

### 2.4.5.4 MAGNETIC DISTURBANCES

Do not place power connector cables, even of other appliances, in close proximity of the devices and their cables. Mobile communication devices may not be used in closer proximity of the devices or their cables than the recommended safety distance!

## 2.4.6 Safety Devices on the System

The system can be switched off at any time in an emergency using the mains switch on the Base Module (toggle switch on the side of the housing); this will cause no damage to the unit.

## 2.4.7 Condition of the Devices

Irrespective of the faultless manufacture of the devices, damage can occur whilst the unit is in operation. With this in mind, always carry out a visual check of the components mentioned before use. Pay particular attention to crushed cables, damaged tubing, and deformed connectors. If you should

notice any damage, please do not use the devices and inform CETONI GmbH without delay. CETONI will put your devices back to an operational condition at the earliest. Do not attempt to repair the devices yourself.

## 2.5 Warranty and Liability

The devices left our company in perfect condition. Only the manufacturer is permitted to open the devices. All guarantee and liability entitlements, particularly damage entitlements due to personal injuries, are void if the devices are opened by an unauthorised person.

The duration of the warranty is 1 year from the day of delivery. It is not extended or renewed due to work carried out under warranty.

CETONI GmbH considers itself responsible for the devices with regard to safety, reliability and function only if assembly, new settings, changes, extensions and repairs are carried out by CETONI GmbH or an authorised centre, and if the devices have been used in accordance with the instruction manual.

The CETONI system conforms to the basic safety regulation standards. Industrial property rights are reserved on the circuits, methods, names, software programs, and units.

# 3 Initial Start-up

## 3.1 Unpacking and setting up the system

Set up your individual CETONI devices, initially without plugging them together or connecting them to each other, on a flat, horizontal surface, e.g. table, base cabinets or equipment trolleys. You can set up the system both horizontally and vertically.

Make sure that the ventilation slots provided on some units are not covered so as not to impair the function of the units.



The example above shows a typical configuration of CETONI devices with the corresponding scope of delivery:

- 1 Base module BASE 120
- 2 2 Nemesys S each with a Contiflow valve
- 3 Bus termination plug
- 4 glass syringe
- 5 Power supply cable
- 6 USB-cable

- 7 Interconnect cable
- 8 Windows PC (customer device - not part of the delivery scope)



**CAUTION.** Consider the reduced stability in the upright position and try to minimize the risk of overturning. Place the devices at least 40cm from the edge of the table.



**IMPORTANT.** Make sure that the ventilation slots which are present on some devices do not get covered.

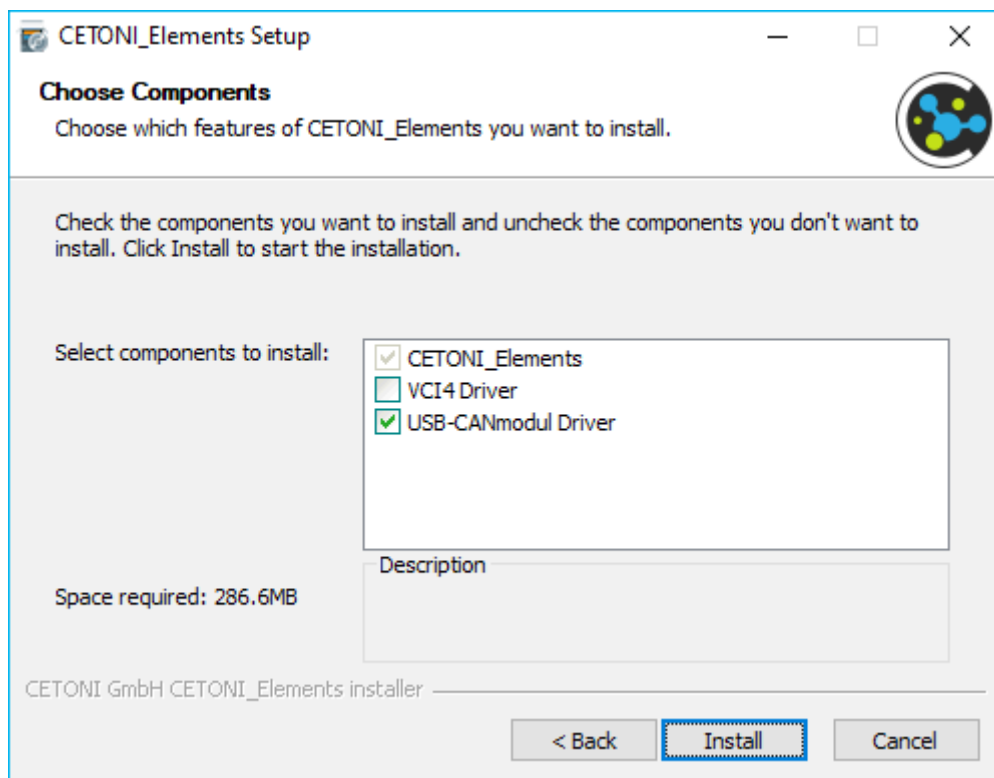
## 3.2 Installing software



**IMPORTANT.** If you operate your system using a CAN or RS232 connection cable and a PLC, please refer to the documentation available ([www.cetoni.de/connectivity-guide/](http://www.cetoni.de/connectivity-guide/)). In this case, the following steps do not apply or do not apply completely.

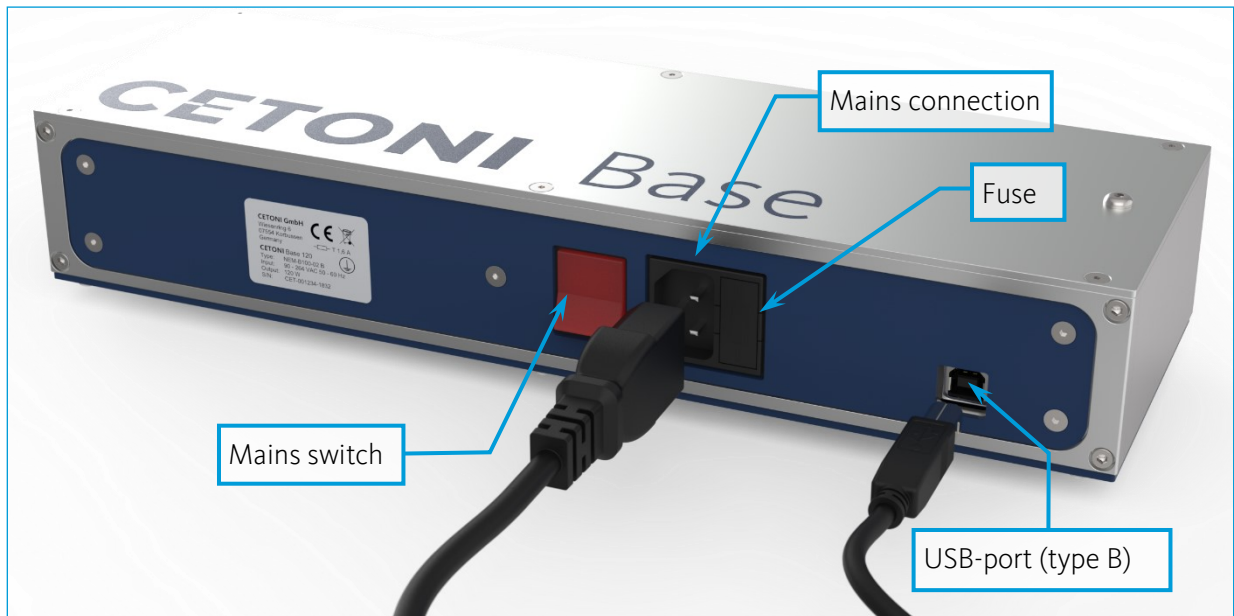
For installation, simply start the setup file of the CETONI Elements software on the enclosed CD.

The hardware device drivers are installed during the installation. This step is only required if the drivers are not already installed on your computer. If the hardware drivers are already installed, please deactivate the driver components (Figure below).



### 3.3 Connecting the base module

Connect the USB port of the base module (USB type B) to a free USB port of your PC (USB type A).  
Connect the base module to a mains socket using the supplied power cable.



**CAUTION.** Risk of injury from damaged cables and connectors. Inspect the device and cables for damage before starting the device! Never operate the device with damaged cables or connectors! Only use cables from the scope of supply.



**CAUTION.** Danger of tripping over the power and connection cable. When laying cables, ensure that any risk of stumbling is avoided!

Turn on the device with the mains switch in order to bring it into an operational condition. The power switch should illuminate when the unit is turned on. If this is not the case, check that the power connector cable is correctly plugged into both the unit and mains power supply.

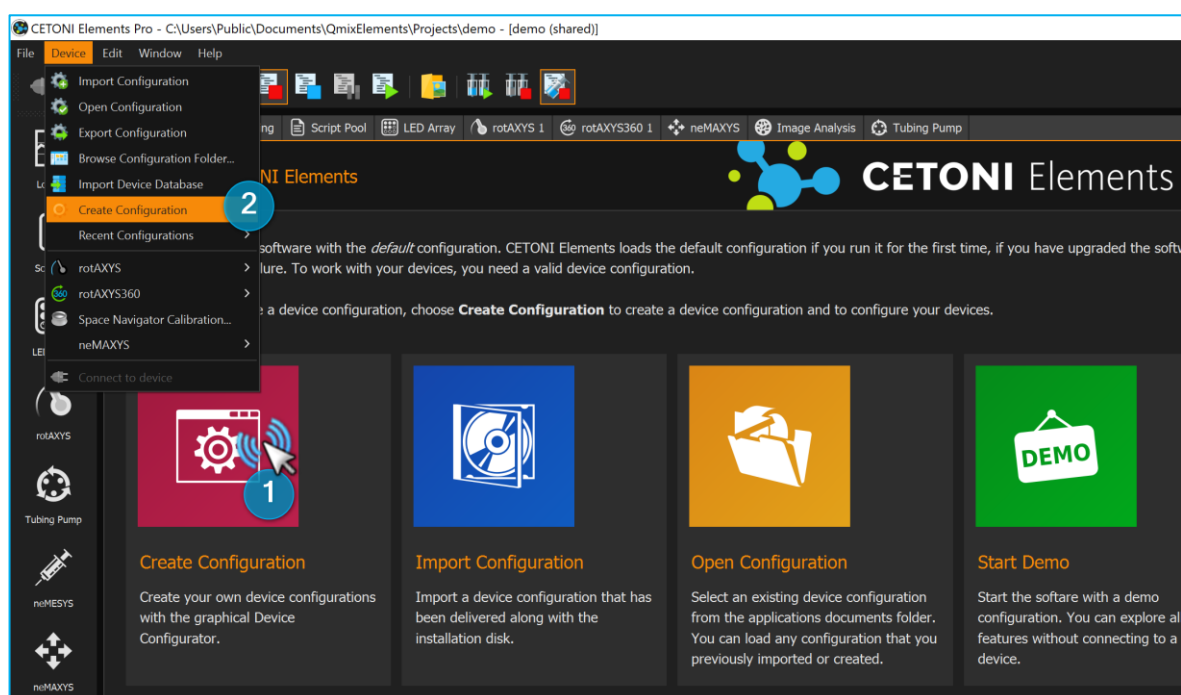
## 3.4 Creating a device configuration

Please connect the base module to your PC as described in the previous section. Use the supplied USB cable and the power cable.

Start the software and activate your licence. You will find the licence key next to the software CD supplied in the manual. Click on *Help* → *Activate License* ①



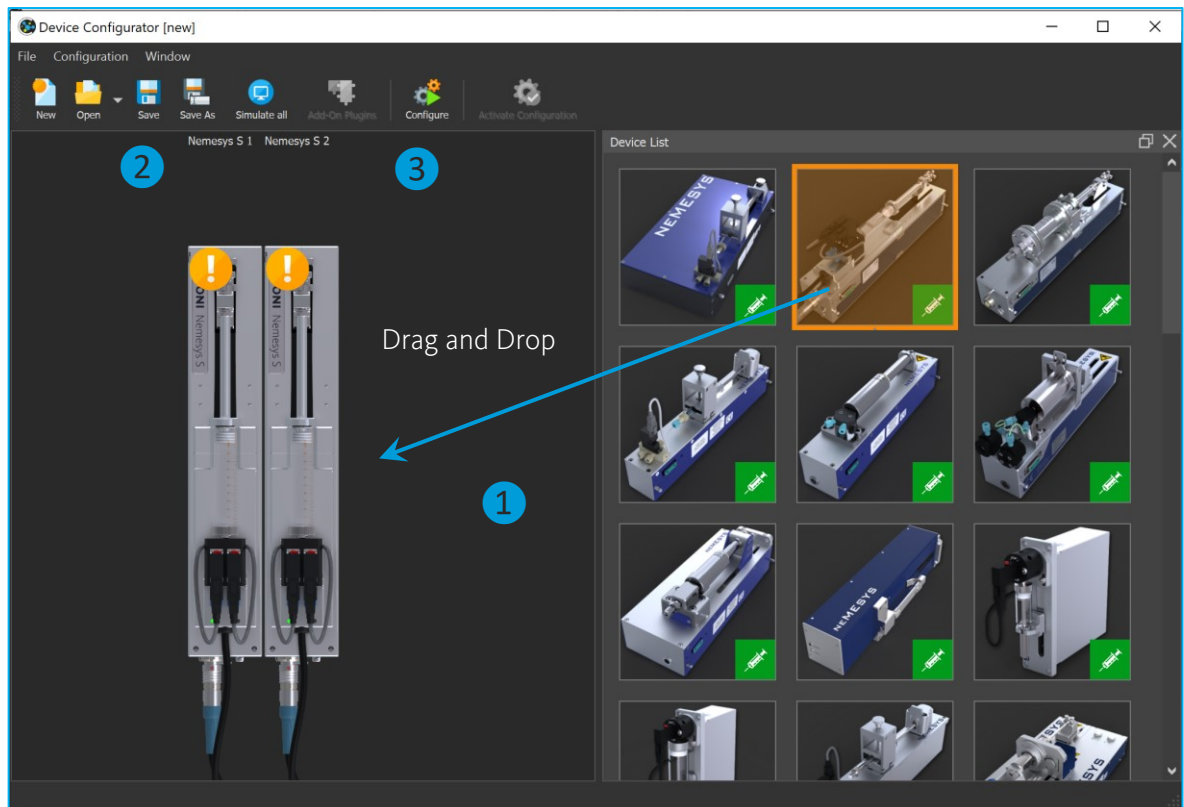
Start the software and click on *Create Configuration* ① or select *Device* → *Create Configuration* ② from the main menu.





reate a new device configuration setup like the physical device setup with the *Device Configurator* by drag & drop. Simply drag and drop the individual devices from the device list into the current configuration **1** or add the devices by double-clicking on them. Please note, adding the base module to your configuration is not necessary, that's why you won't find it within the device list (except you own a *Starter Module* with integrated pump).

Save this configuration by clicking on *Save* **2** and continue by clicking on *Configure* **3**.



**IMPORTANT.** Please do not plug all modules of your setup together from the beginning as it needs to be a step by step procedure. The software carefully guides you through the configuration process of each single module on your screen.

## 3.5 Configuring single modules

After clicking on *Configure*, the *Configuration Wizard* guides you through the configuration of all modules. Simply follow the instructions on the screen to configure each module one by one.



**HINT.** If you have received a configuration or project file (.qcf or .qpr) from us, your system is pre-configured by us accordingly. The project file contains your configuration, which you load via *File* → *import project* or *device* → *import configuration*.

### 3.5.1 Systems with Nemesis S or Nemesis M

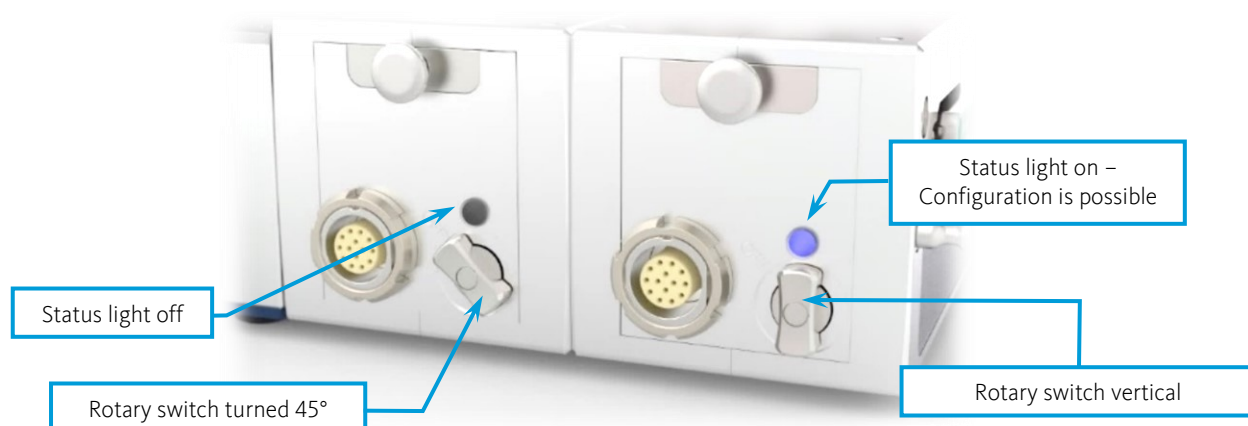


- (1) Connect the base module to your PC and the power supply. To do this, use the supplied USB cable and the cold appliance cable (mains switch).
- (2) In case of a Nemesis S, install the supplied syringe holder (I-piece, universal holder or the Contiflow valve) as described in the Nemesis S hardware manual.
- (3) Both the base module and the pumps with their own on/off switch (i.e. Nemesis S or M) must be switched off. For the pumps, the rotary switch must be turned 45° counterclockwise.

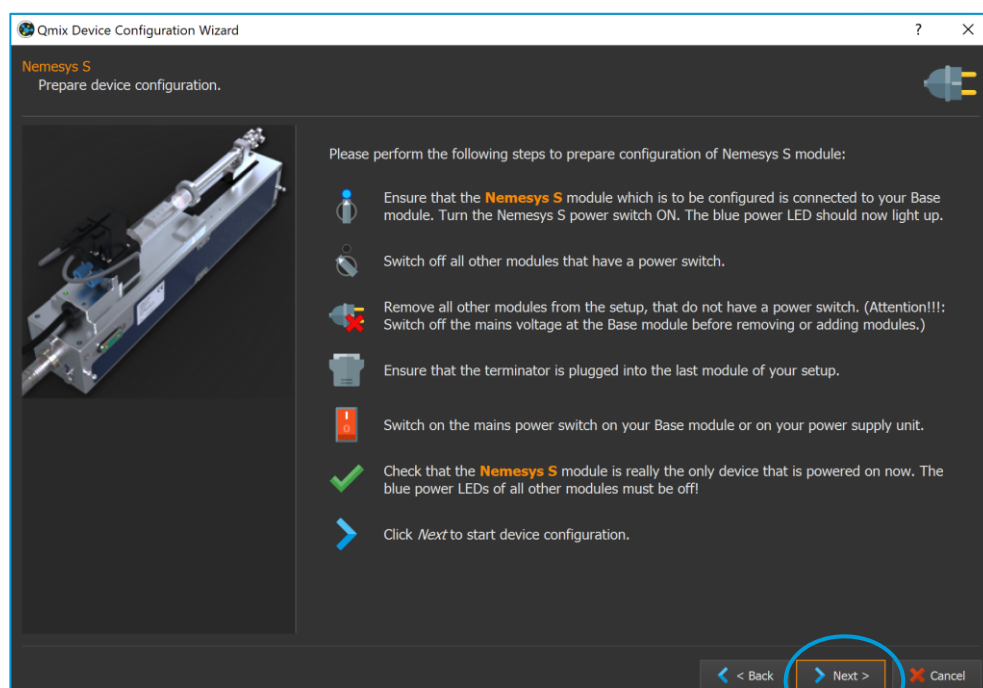


- (4) Then connect all pumps with their own on/off switch (i.e. Nemesis S or M) to the base module. If your system also consists of other units, proceed for this devices as described in 3.5.2.
- (5) Finally, plug the BUS terminator into the last pump.
- (6) After the entire system is plugged together, switch on the base module. Switch on the pump module that you want to configure 1 by turning the rotary switch clockwise to the vertical

position. The status light on the module lights up blue. All other modules **2** must still be switched off during configuration - the rotary switch is turned 45° counterclockwise to OFF and the status light is off.



**(7)** Please follow the instructions on the screen. Check all the steps displayed.



**(8)** Click *Next* to start the automatic configuration. The configuration wizard shows you the successful configuration of the Nemesys pump. Click the *Next* button with the left mouse button to continue.

**(9)** After the successful configuration, switch off the first syringe pump and switch on the next syringe pump to be configured.

**(10)** Continue to follow the on-screen instructions and repeat the same steps for each additional pump module until you have completed the configuration of all modules



**HINT.** To establish the connection between the base module and the pump modules you can also use the interconnect cable supplied.



**CAUTION.** After the configuration process is complete, the BUS terminator remains on the last unit!

### 3.5.2 Systems with other devices (except Nemesis S or Nemesis M)



- (1) Connect the first device to the base module according to the instructions in the software. Only one device at a time may be connected to the base module for configuration. Make sure that the base module is switched off when connecting and disconnecting modules.



**HINT.** For an easier mechanical handling you can use the interconnect cable ② for creating connectivity between the base module and the device to be configured.



**IMPORTANT.** Make sure that the bus terminator plug ③ is always plugged in before the system is switched on, otherwise data communication may be disturbed.

- (2) Switch on your base module and follow the instructions on the screen. Check all the steps displayed.

- (3) Click Next to start the automatic configuration.
- (4) After successful configuration, **disconnect the device you have just configured** from the base module.



**CAUTION.** Always switch off the base module before removing or connecting devices to prevent damage to the devices!

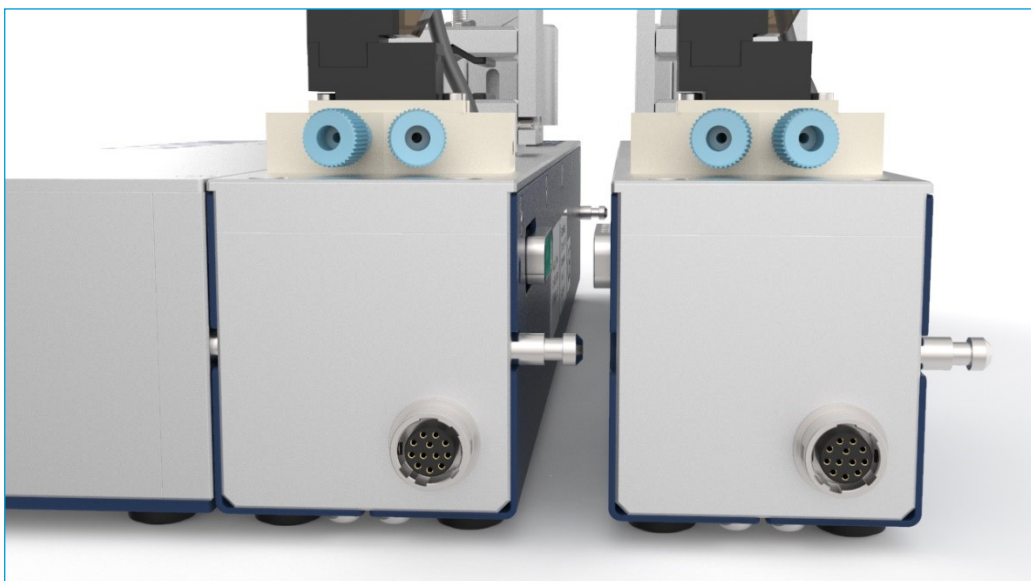
- (5) Follow the instructions displayed on the screen as before.
- (6) Repeat these steps for all other devices in this configuration.



**IMPORTANT.** During configuration, connect only **one single module** at a time to the base module to configure it in the software.

## 3.6 Assembling the complete system and connecting it to the software

- (1) After the successful software device configuration of all modules, you can switch on all Nemesis S/M modules or connect the other physical devices all together to complete the setup now. To do this, place the module that you want to connect next to your base module or your existing system so that the centering pins of the last module of the system are opposite the centering holes of the module to be connected. Plug the new module into the system. The centering pins are guided into the respective centering holes and the connectors are connected with a contact fit. Connect the D-Sub connectors together ensuring a secure contact. To ensure a proper contact between the modules, both modules must lie flat against each other. Avoid tilting the modules.



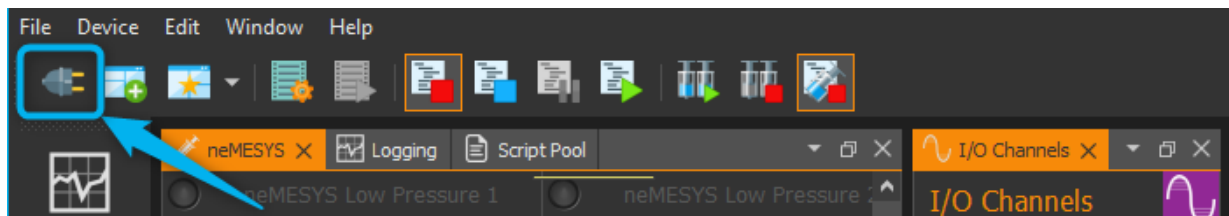
- (2) Plug the bus terminator plug into the socket of the last connected module of your system.



**IMPORTANT.** The CAN BUS must be terminated on both sides with a 120  $\Omega$  terminating resistor, otherwise there may be interference in the data communication. At the beginning, the corresponding resistor is present in your base module. Check that the terminator plug is connected to the last device.

If you have your own PLC control and the corresponding connection cables, there is a terminator resistor in the connection cable. Make sure to use the terminator plug or the terminator socket (for RS232 connection) to terminate the BUS at your last device.

- (3) Follow the instructions of the *Configuration Wizard* and restart the software. Then establish a connection between your configuration and the physical devices by clicking on the connector icon (see figure below) in the user interface.



Now your CETONI system is ready for use.



**IMPORTANT.** The function of the devices was tested with water prior to the delivery. Despite thorough cleaning minimal residues may remain in the system. If you have a critical application, you should rinse your system before use.



**IMPORTANT.** Deactivate the standby / sleep mode of your PC to avoid malfunctions.

## 3.7 Separating modules

### 3.7.1 Nemesisys S und Nemesisys M

The syringe pumps Nemesisys S and Nemesisys M have a built-in disconnection mechanism. To disconnect, press the button on the front of the module firmly **1**. This disconnects the plug-in connection to the previous module. Then pull the other end of the module off the system by the centring pin **2**. You can remove the single module and plug the bus terminator back into the open connector of the last module.

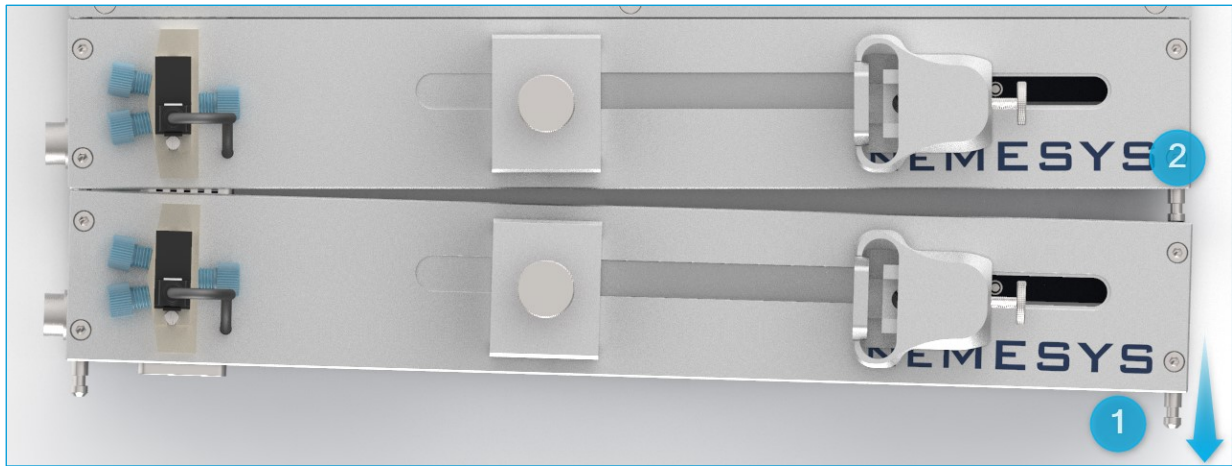


### 3.7.2 Other modules

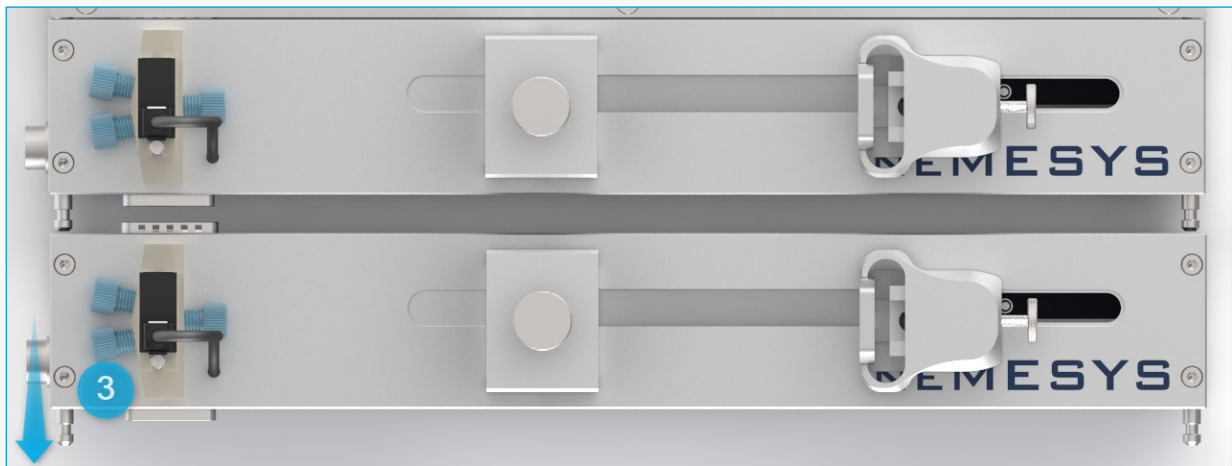
The other modules are held together by the two centring pins and by the connector and socket of the CETONI system interface and do not have a separating mechanism. When separating the modules, it is easy to tilt them, which can bend the centering pins and make it difficult to pull the modules apart.

If you want to remove the last module of a system, pull slightly on the rear centering pin of the last module **1** while holding the module in front of it with the other hand. Pull the rear end of the module on the centering pin away from the previous module until the centering pin of the previous module **2** is completely visible.





Then pull the front end of the module on the centering pin **3** away from the system while holding the previous module in line with the other hand.



You may now remove the individual module and reconnect the bus terminating plug (terminator) to the last module of the remaining system.



# 4 Transport and Storage

Please do not lift or transport the modules while they are plugged into each other. Transport in assembled state is only permissible when using the original packaging.

Use the original packaging for shipping the modules.

For the storage of the devices, observe the storage instructions in the corresponding device manuals.



**ATTENTION.** Danger of damaging the device! Never transport modules while they are plugged into each other.

# 5 Disposal

The devices are electrical resp. electronic devices.

The symbol of a crossed-out wheeled bin indicates that the respective device must be collected separately from unsorted municipal waste at the end of its service life.



If you wish to dispose one of your devices, please contact us as the manufacturer of the devices via the known contact channels. We will contact you immediately and provide you with all important information on how to return the devices to our company site.

Please decontaminate the devices before returning them, if necessary, and enclose the completed decontamination declaration.

Upon receipt of the returned equipment, we will take care of its proper disposal.