



**DEWETRON**  
**DEWETRON Explorer**

**Technical Reference Manual**

Dewetron GmbH

August 27, 2024

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# Preface

The DEWETRON Explorer is standalone software designed as a device manager for DEWETRON hardware. Its primary functions include conducting hardware functionality checks, performing firmware updates, and simulating hardware.

## Document History

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# 1 Installation

DEWETRON Explorer is installed automatically when installing TRION hardware drivers by running the installation program DEWETRON-TRION-Applications-xxx.exe. The installation process differs depending on the operating system.

## Windows Installation

The Windows installation file can be found in the directory files\drivers\01\_TRION\DEWETRON TRION X.x of the delivered *Install Media* USB stick or downloaded from <https://ccc.dewetron.com/>. The installation process is straight forward: Run the installation file, click on install and wait until the process is finished.

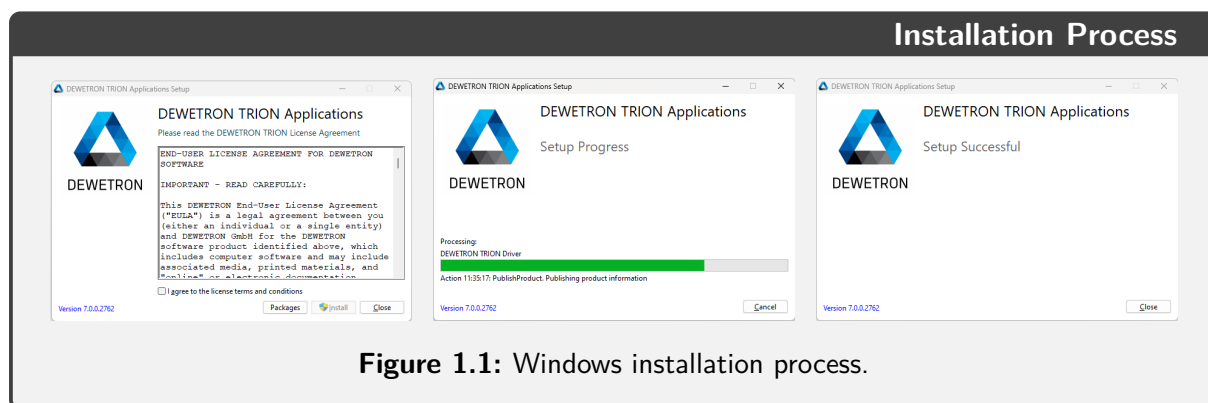


Figure 1.1: Windows installation process.

## WARNING

If another version of DEWETRON Explorer is already installed, the existing version must first be uninstalled.

## Linux Installation

To efficiently install DEWETRON software on Linux, ensure compatibility with either RHEL or Ubuntu as your operating system. Depending on your DEWETRON software version, verify the appropriate OS version. Follow these streamlined steps for installing DEWETRON Explorer:

1. Download the correct OS-specific installer from [ccc.dewetron.com/pl/oxygen](https://ccc.dewetron.com/pl/oxygen).
2. Open your terminal and navigate to the installer directory
3. Unpack the installer with: 

```
gzip -d dewetron-apps-*.install.gz
```
4. Run the installer: 

```
sudo chmod +x ./dewetron-apps-*.install  
sudo ./dewetron-apps-*.install
```

The process should complete shortly. Note that on Linux, there's no need to uninstall previous DEWETRON software versions before installing new ones.

## 2 Getting Started

The DEWETRON Explorer is a stand-alone software, which acts as a device manager for DEWETRON hardware and offers multiple functionalities. In addition to the automatic detection of all connected devices, the three main features are:

1. check hardware functionality (Chap. 3)
2. update TRION board firmware (Chap. 4)
3. simulate DEWEx- and TRION hardware (Chap. 5)

These key features are discussed in more detail in the corresponding chapters. First of all however, lets get started with the GUI and its basic structure. Fig. 2.1 shows an example of the DEWETRON Explorer GUI with a connected device highlighting different sections of the GUI:

- ① Menu Bar                      ② Toolbar                      ③ Hardware-tab                      ④ Demo-tab

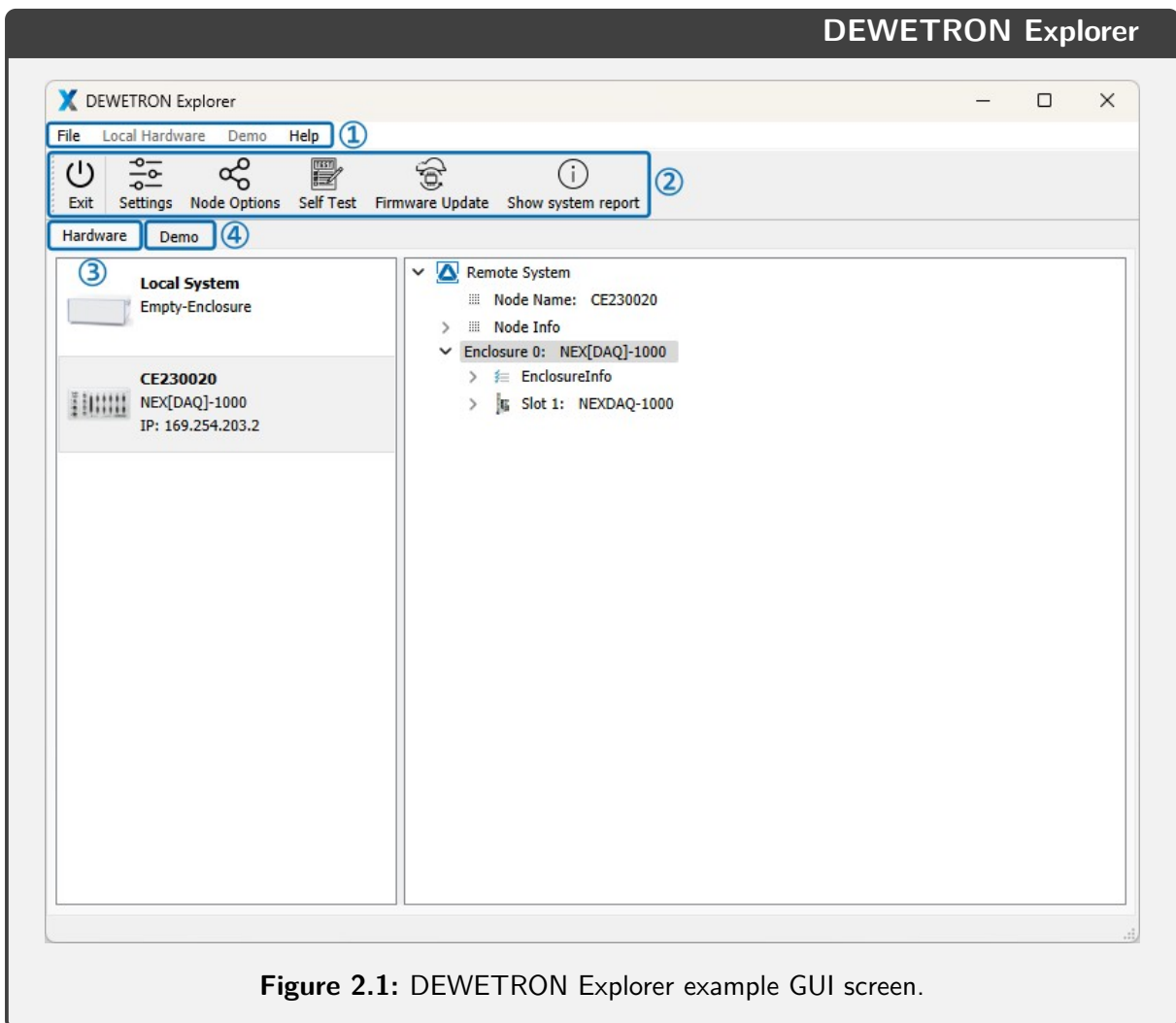


Figure 2.1: DEWETRON Explorer example GUI screen.

## 2.1 Menu Bar

The menu bar provides access to various commands and features grouped into menus. The following menus are included:

### File

- **Exit:** Button to exit the software. If changes have been made it triggers an automatic prompt that asks to save changes. This function is also accessible via the toolbar.
- **Settings:** This button opens the settings menu. This function is also accessible via the toolbar. For a detail description see Sec. 2.2.

### Local Hardware

- **Save Configuration:** Saves the current configuration.
- **Logging Configuration:** Opens the Log Settings menu, allowing detailed configuration of local system logging for the TRION API.

### Demo

- **Load Demo System from File:** Loads an existing Demo System setup from an \*.xml file.
- **Save Demo System to File:** Saves the selected Demo System setup to an \*.xml file.
- **Use Selected System as Demo:** Uses the active Hardware setup as Demo System setup.
- **Save Selected System to Demo File:** Saves the currently used Hardware setup to a demo file (\*.xml file).
- **Sample Generator:** Choose between Auto and Pre-initialized.  
Auto: Generates samples for demo signals in OXYGEN live during operation.  
Pre-initialized: Used when live generation of samples is not feasible, especially with 10 MS. In this mode, the ring buffer is pre-initialized and the signals are played back instead of being recalculated during operation.

### Help

- **Software Versions:** Displays the current versions of DEWETRON Explorer, DEWETRON TRION API, and further related software.
- **About:** Provides basic information about DEWETRON Explorer
- **About Qt:** Provides details about the Qt framework used in the application.

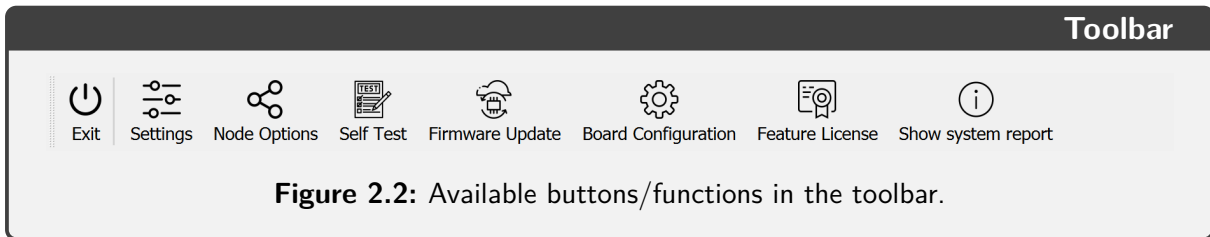
## 2.2 Toolbar

The toolbar provides access to various functions and settings via several buttons. The availability of the individual buttons depends on the connected and selected devices. Nevertheless, the following buttons are permanently available:

- Exit
- Settings
- Show system report

Connecting specific devices and modules as well as selecting certain panels in the hardware area will display additional buttons in the toolbar and hence enable further features. These features include:

- Node Options
- Self Test
- Firmware Update
- Feature Update
- Board Configuration



**Figure 2.2:** Available buttons/functions in the toolbar.

### 2.2.1 Exit

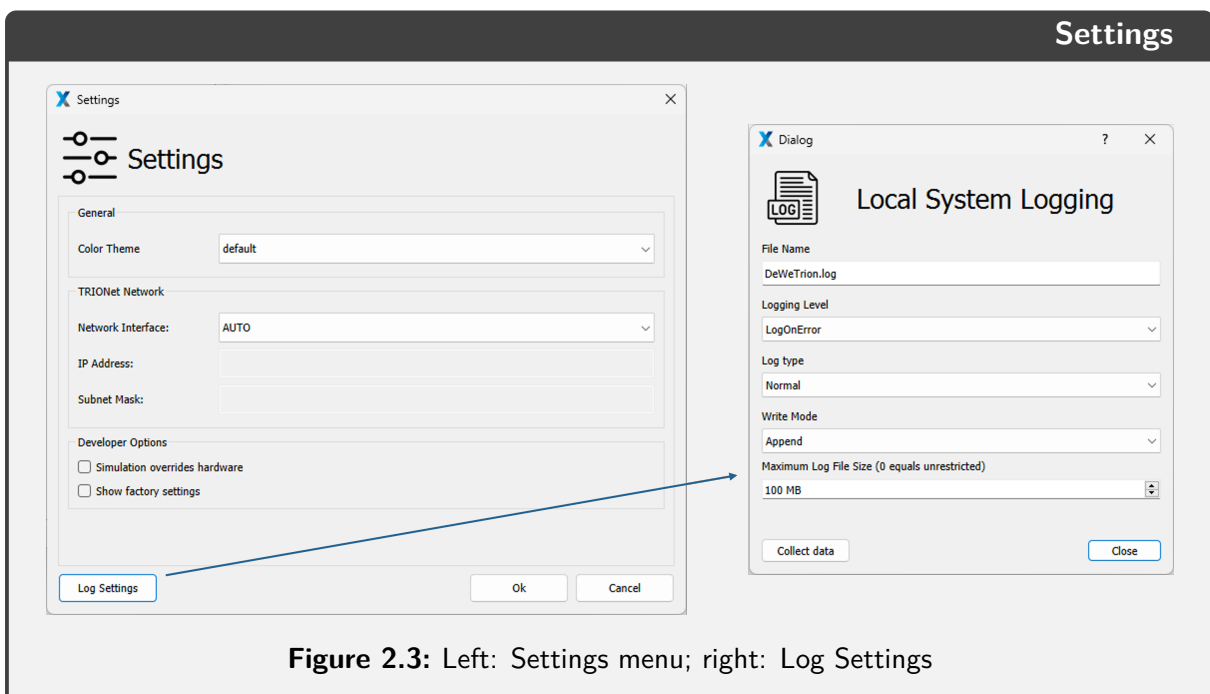
Button to exit the software. If changes have been made it triggers an automatic prompt that asks to save changes. Also accessible via the "File" menu in the menu bar.

### 2.2.2 Settings

The "Settings" button opens the settings menu (Fig. 2.3; left panel), providing access to various options. Within the section General, you can customize the color theme of the DEWETRON Explorer to suit your preferences. The section TRIONet Network enables the configuration of TRIONet Networks. For detailed TRIONet network specifications, refer to the [TRIONet3 Technical Reference](#) documentation.

In the section Developer Options, it is possible to override system hardware with simulated (demo) hardware. Note that this will prevent automatic recognition of local hardware. Additionally, the Developer Options allow you to display factory settings, although this is not recommended unless explicitly advised. The settings menu further includes Log Settings (Fig. 2.3; right panel), which allow detailed configuration of the local system logging of the TRION API.

The settings menu can also be accessed via the "File" menu in the menu bar.



**Figure 2.3:** Left: Settings menu; right: Log Settings

### 2.2.3 Show system report

The "Show system report" button opens a new window displaying basic system information. This information can be exported to a \*.txt file using the "Save" button, which is required for a license upgrade. For more details, refer to Sec. 6.2.

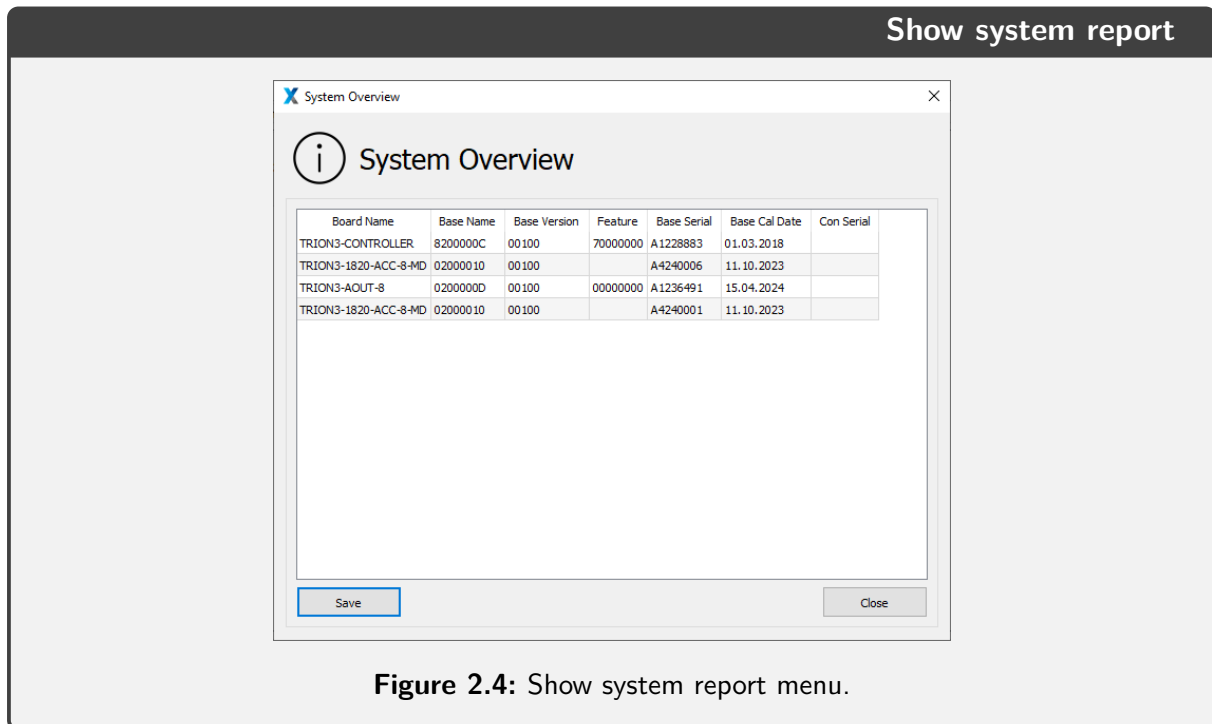


Figure 2.4: Show system report menu.

### 2.2.4 Node Options

The "Node Options" icon is accessible only when a DEWETRON front-end device is connected to the system. Clicking this button opens the node options menu (Fig. 2.5), providing configuration settings for the connected front-end. It allows users to reboot or restart the node, modify the node's IP address and name, and update the front-end device's software. For detailed instructions on updating your device properly, refer to the respective device manual. Additionally, all of these settings can also be customized by right-clicking on the front-end device in the "Hardware" tab.

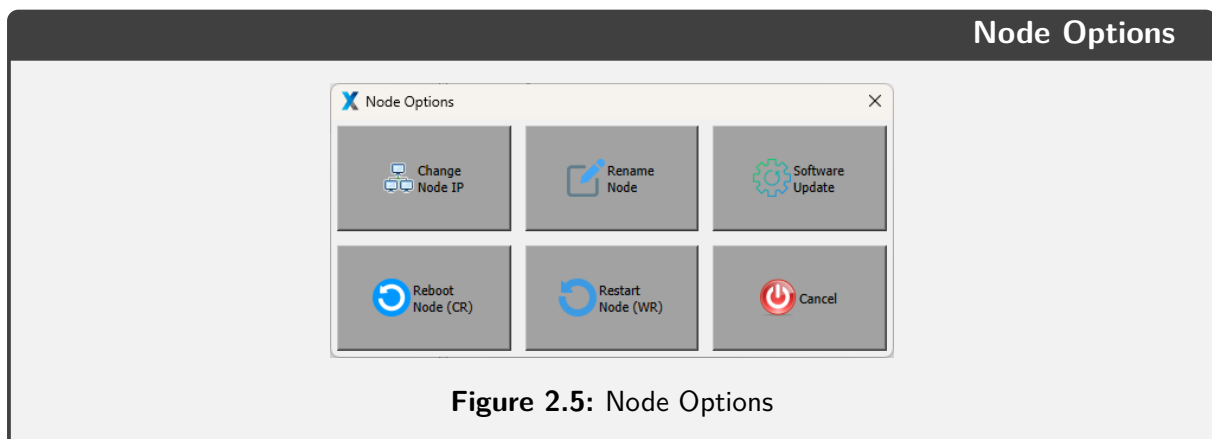


Figure 2.5: Node Options

### 2.2.5 Self Test

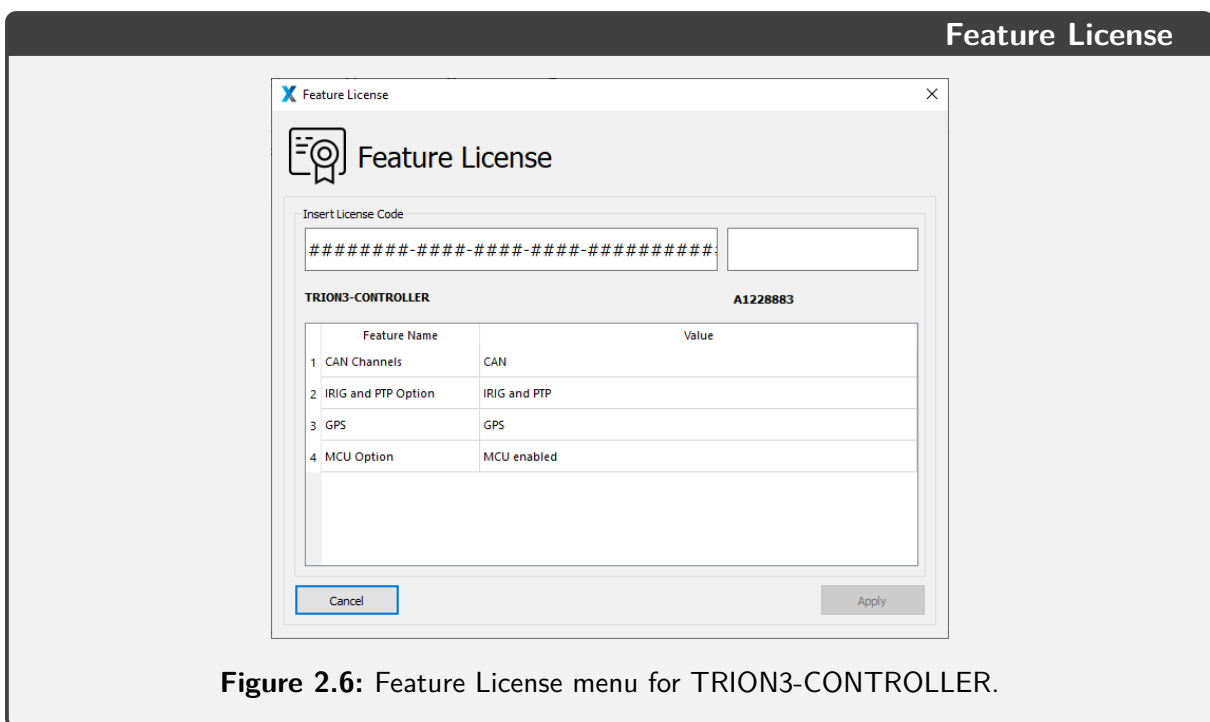
The "Self Test" button becomes available either by selecting the "Enclosure" or any mounted slot in the hardware section. This button opens the "Self Test" menu for functionality checks on plugged hardware. Refer to Chapter 3 for a comprehensive description.

### 2.2.6 Firmware Update

The "Firmware Update" button becomes available either by selecting the "Enclosure" or any mounted slot in the hardware section. This button opens the "Firmware Update" menu allowing you to update the firmware of the plugged hardware. Refer to Chap. 4 for an comprehensive description.

### 2.2.7 Feature License

The "Feature License" button is available for hardware devices with adjustable features and opens the feature license menu. Fig. 2.6 shows an example using a DEWE3-A4 TRION3-CONTROLLER (Chassis controller). The menu provides information on currently active license features and allows for remote license upgrades on DEWETRON devices. For a detailed guide on upgrading a license, refer to Section 6.2.



**Figure 2.6:** Feature License menu for TRION3-CONTROLLER.

### 2.2.8 Board Configuration - TRION3-1802/1600-dLV-32

For the TRION3-1600-dLV-32 and TRION3-1802-dLV-32 an additional "Board Configuration" button becomes available, when selecting the module in the hardware section. This button opens the "Board Configuration" menu, allowing to switch between single-ended and differential modes.

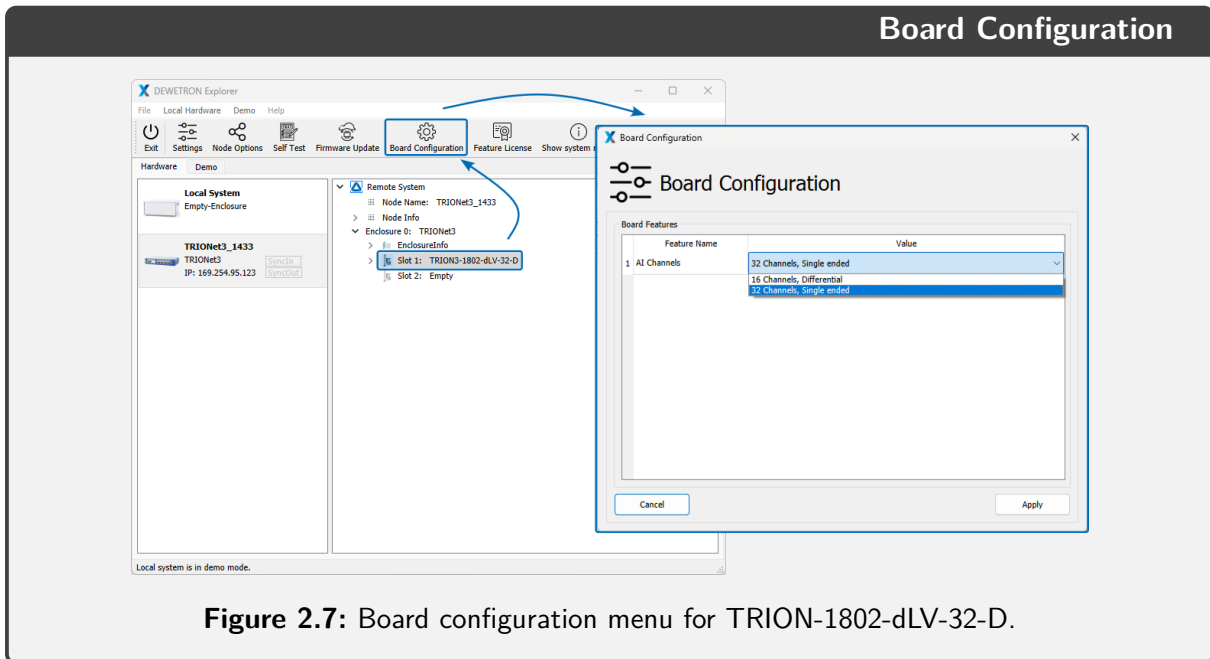


Figure 2.7: Board configuration menu for TRION-1802-dLV-32-D.

## 2.3 Hardware section

Fig. 2.8 highlights the hardware section. The left panel displays all connected devices. In this case this includes the local system (PC) and a connected front-end system (NEX[DAQ]). The right panel displays detailed information about the selected device, such as system specifications, connected modules, and MSIs. Use the drop-down arrows to expand or minimize the displayed information.

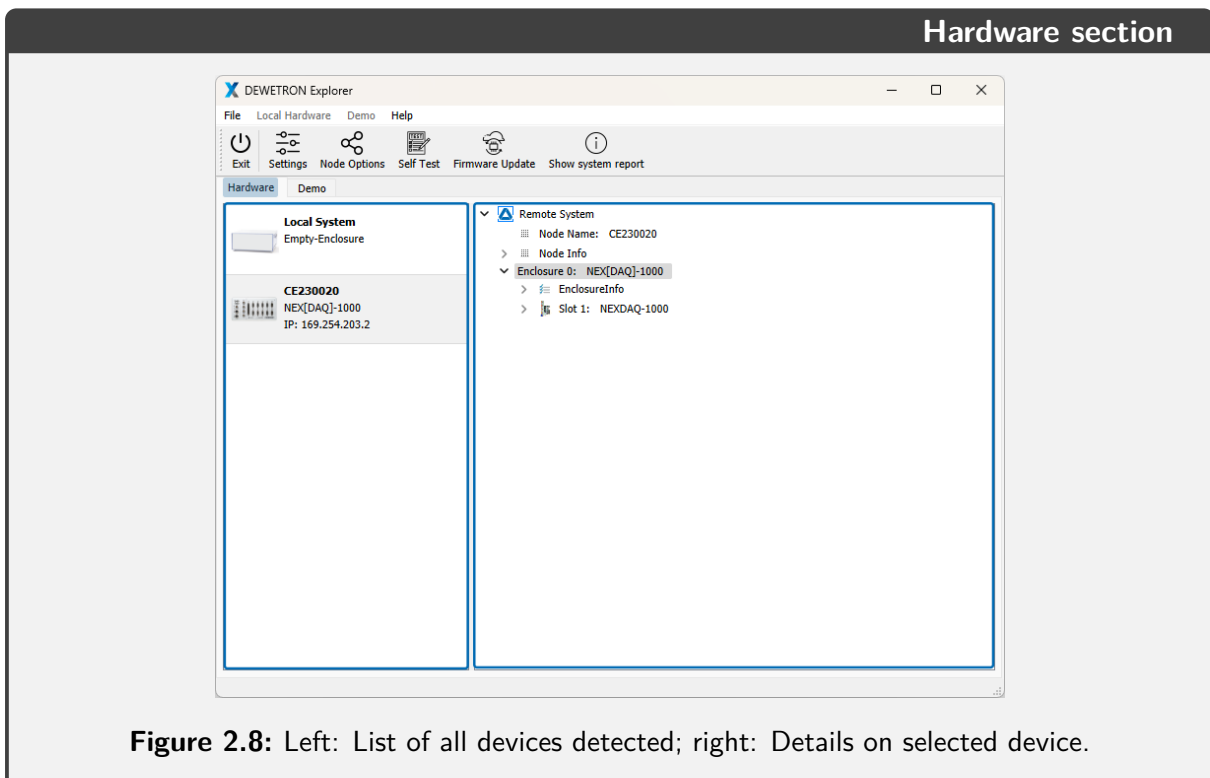


Figure 2.8: Left: List of all devices detected; right: Details on selected device.

## 2.4 Demo section

Click on "Demo" to switch to the Demo section. This enables the simulation of any DEWETRON device including all available TRION modules. We describe this feature in more details in Chap. 5.

### 3 Hardware Functionality Check

The hardware functionality check, also known as the self-test function, is designed to verify all features of an TRION module and perform a complex analog accuracy check. This function is particularly useful for critical measurements, as it can be conducted both before and after the measurement to ensure that the hardware is functioning properly throughout.

To initiate a self-test, select the measurement system and click either on "Enclosure" to test the entire hardware or select a single slot. Then, click on the "Self Test" button in the menu bar or via the right-click menu. This will launch the Self-Test window, as shown in Fig. 3.1. This tool offers several different functions, described below. Additional module-dependent functionalities can be found in the TRION series module manual.

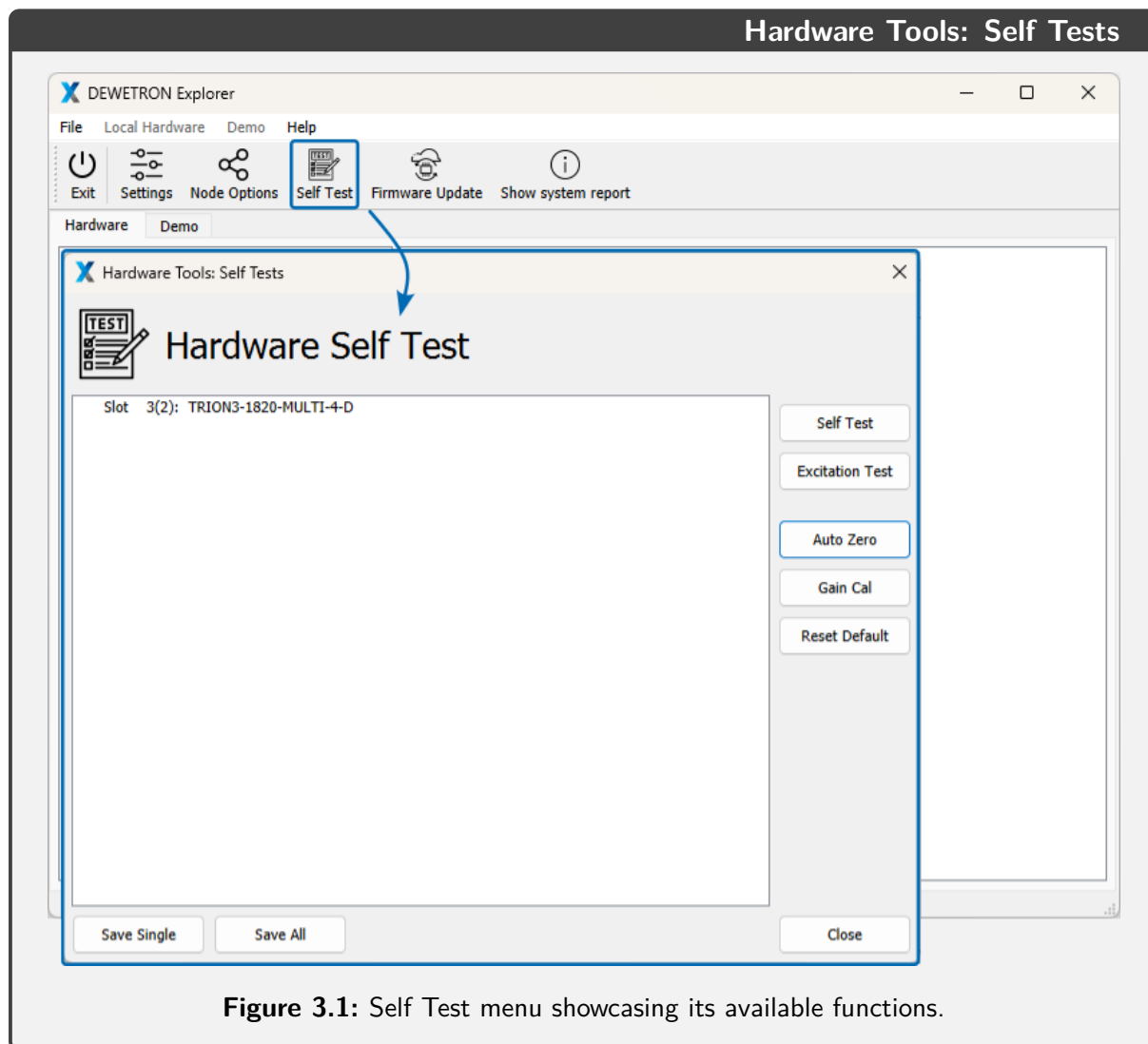


Figure 3.1: Self Test menu showcasing its available functions.

### 3.1 Self Test

The "Self Test" function is based on an integrated self test circuit of the selected TRION module. Overall, the function is designed to verify all features of the board. However, depending on the module, the scope and complexity of the test may vary substantially. For detailed information, refer to the respective module in the [TRION modules reference document](#). An example for a successfully completed self test is displayed in the left panel of Fig. 3.2.

### 3.2 Excitation Test

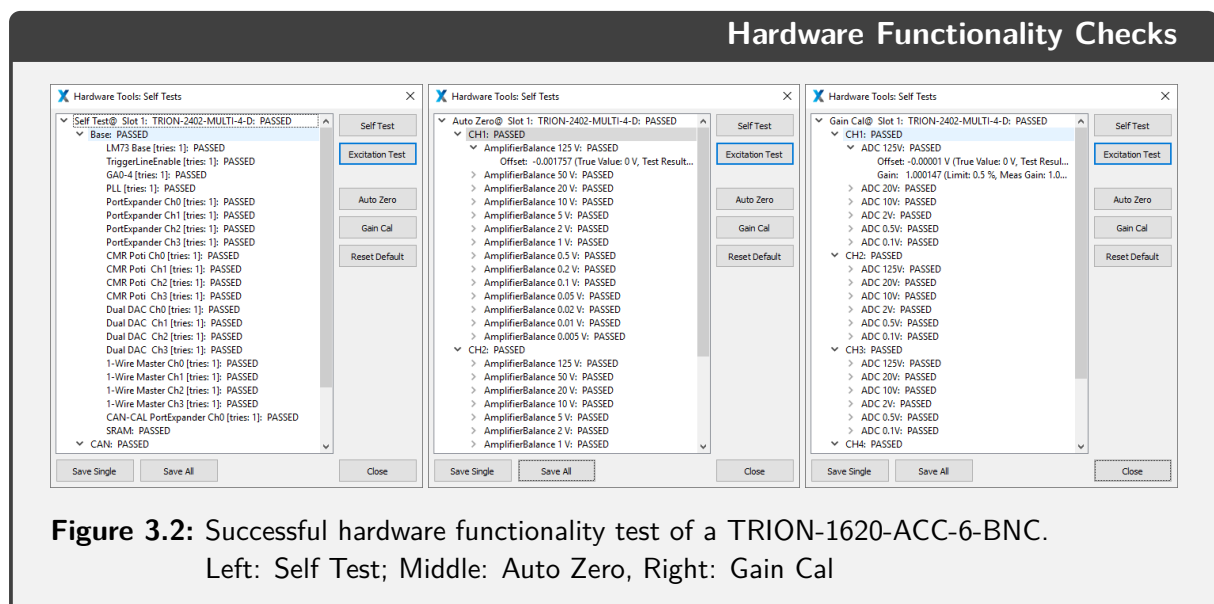
This function applies 1 V and 5 V to the excitation terminals. By reading back the excitation with the input amplifier, it checks if the excitation circuit is working correctly. For correct execution, no load (devices, sensors, etc.) must be connected. Note that the "Excitation Test" is only applicable to TRION(3) MULTI modules.

### 3.3 Auto Zero

The "Auto Zero" or "Amplifier Balance" function eliminates automatically all internal amplifier offsets. It switches the differential amplifier inputs IN+ and IN- to the internal GND reference point. Consequently the offset of the module is adjusted to zero for all ranges. This function can take up to 4 seconds. It allows compensating the long term zero drift, as well as temperature drifts of the amplifier. The determined offset correction values are stored in the user memory section of the EE-Prom. An example for a successfully completed "Auto Zero" function is displayed in the middle panel of Fig. 3.2.

### 3.4 Gain Cal

The "Gain cal" function is an adjustment function. It applies the internal calibration source to all channels. The measured error is used as a calibration factor for correcting the measurements. These correction factors are stored in the user memory section of the EE-Prom. An example for a successfully completed "Gain Cal" function is displayed in the right panel of Fig. 3.2.



**Figure 3.2:** Successful hardware functionality test of a TRION-1620-ACC-6-BNC.  
Left: Self Test; Middle: Auto Zero, Right: Gain Cal

### **3.5 Reset Default**

This function clears all correction values stored in the user memory and resets them to default values.

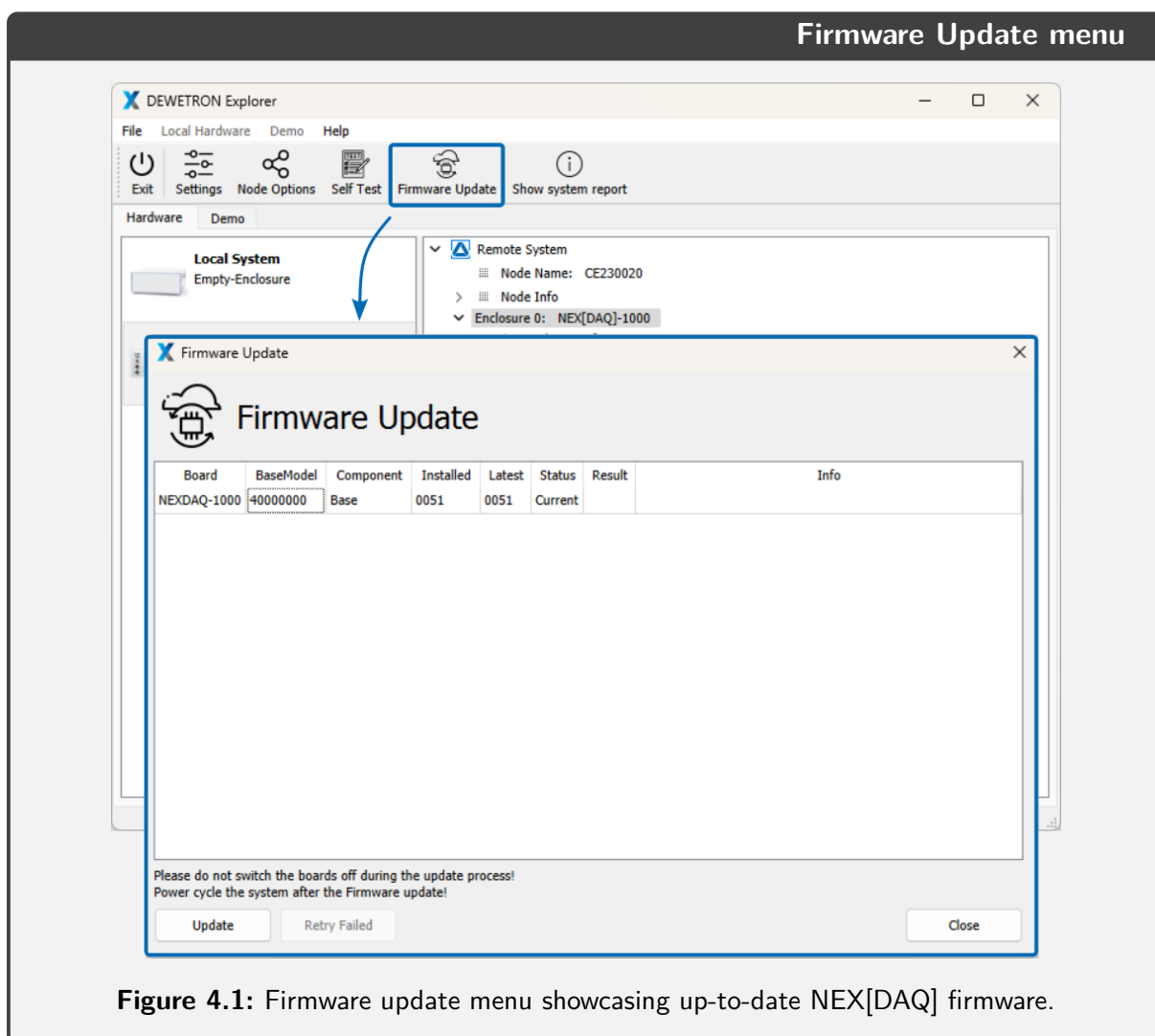
### **3.6 Save Single / Save All**

These options allow you to store either a single or all test results in an .XML file on the internal HDD.

## 4 Firmware Update

The firmware for each TRION module is bundled with the TRION hardware driver. If a newer firmware version is available, DEWETRON Explorer will automatically detect it and display a notification next to the affected module.

To update the firmware, select the relevant measurement system and click on "Enclosure" to update all hardware, or choose a single slot. Then, click the "Firmware Update" button in the menu bar or use the right-click menu. This action opens the Firmware Update menu (see Fig. 4.1), which shows the currently installed firmware version, the latest available version, and further information. To begin the update process, click the "Update" button. If an update fails, you can attempt to resolve the issue by clicking the "Retry Failed" button. After completing the update, shut down the system and disconnect the power plug for approximately 5 seconds. Restarting the system will finalize the firmware update process.



## 5 Demo System Simulation

In the Demo section, you can configure a complete simulated DEWETRON system, enabling simulation of any DEWETRON device alongside combinable TRION modules. Figure 5.1 illustrates the demo screen: ① presents the currently simulated devices with selected modules, while ② lists all objects (devices or modules) that can be added.

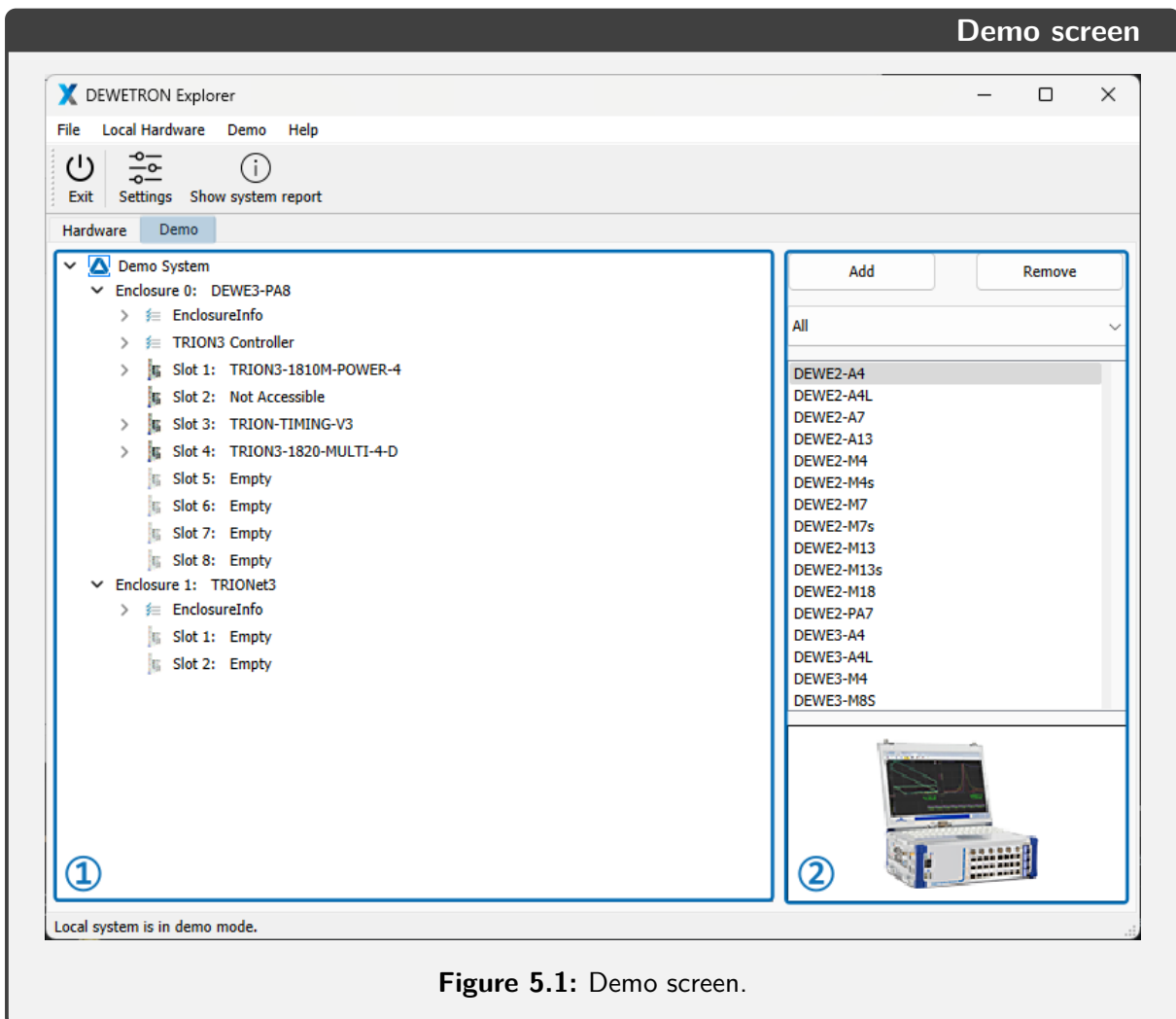


Figure 5.1: Demo screen.

To add a new device, follow these steps:

1. Click on "Demo System" in subwindow ①.
2. Select a device from the object list ② and click "Add".
3. Click on an empty module slot. If unavailable, open the drop-down menu.
4. This action will switch the device list to the module list.
5. Choose the desired module and click "Add".

To remove a device or module:

1. Select the object and click "Remove".
2. For modules, this action empties the slot.
3. For devices, it removes the device along with all its integrated modules.

To change a device or module:

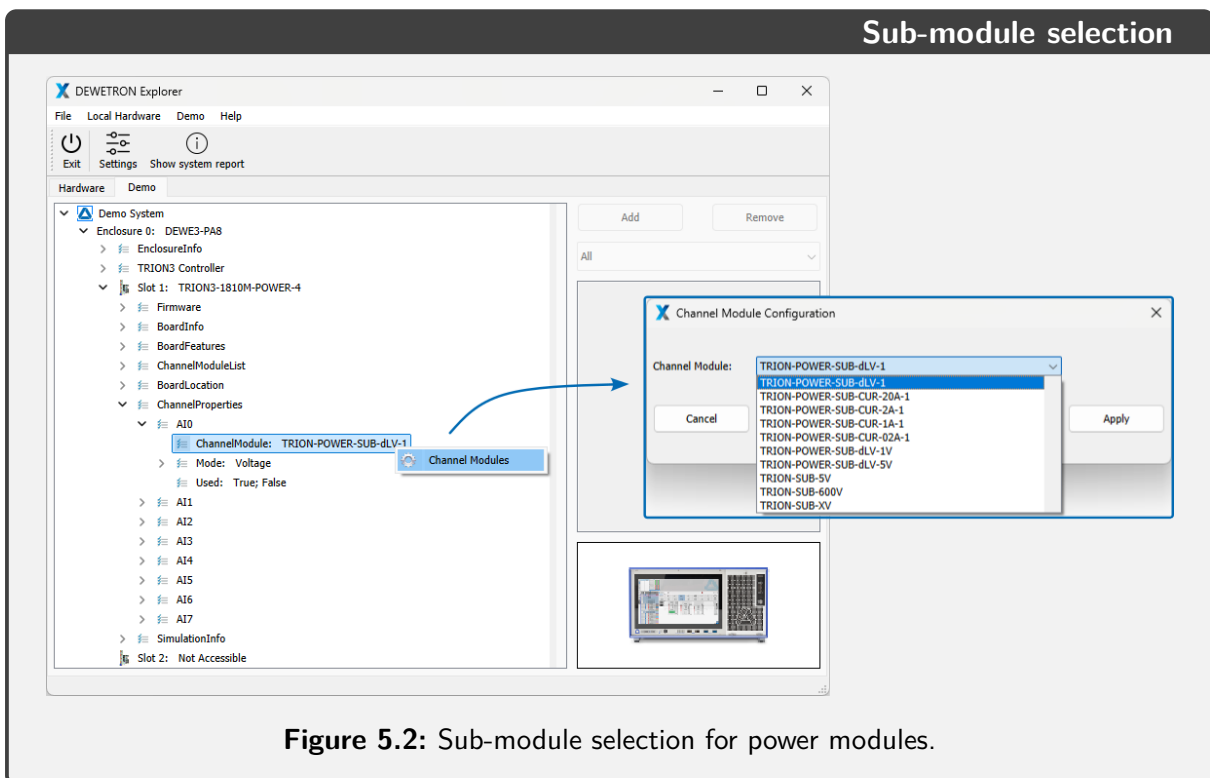
1. Remove it and add a new one.
2. Or, simply click "Replace" to swap it with the currently selected object from the object list.

## 5.1 Additional module specific settings

### 5.1.1 Power Modules

All TRION(3)-18XX-POWER modules are equipped with a number of exchangeable sub-modules. Therefore, these sub-modules can also be defined in a simulated system. To do so follow the subsequent steps:

1. Open the drop-down menu of your power module, and further open the tab "ChannelProperties". This will list the available channels of your selected power module.
2. Open the drop-down menu of your desired channel.
3. Right click on "ChannelModule" and open the module settings.
4. Select the desired sub-module and click "Apply".



#### INFORMATION

For a visual guide on setting up demo systems, check our [tutorial video](#) or [training presentation](#).

## 6 Additional specific information

### 6.1 DEWETRON Explorer and OXYGEN

OXYGEN is DEWETRON's user-friendly measurement software and is tightly interlinked with the DEWETRON Explorer when TRION hardware is utilized. To access devices based on TRION firmware, they must first be detected within DEWETRON Explorer. If a TRION device is not detected within DEWETRON Explorer, it will also not be detected within OXYGEN. Therefore, if a TRION device is not recognized within OXYGEN, ensure its availability within DEWETRON Explorer first.

Based on the linkage of these two applications, there are some important considerations when working with OXYGEN and DEWETRON Explorer. Firstly, note that both programs cannot be used simultaneously, as a TRION device can only interact with one application at a time. Attempting to use both programs simultaneously will result in an error message. Depending on which software was initialized first, you may encounter either an OXYGEN warning stating "**⚠️ TRION API locked by another process! (ERROR\_HARDWARE\_ALREADY\_IN\_USE)**" or a DEWETRON Explorer warning stating "**TRION hardware is used by another application. DEWETRON Explorer will not be able to display local TRION boards.**"

Secondly, simultaneous usage of actual hardware systems and simulated demo systems is not possible in OXYGEN. OXYGEN cannot distinguish between virtually created demo systems and physically connected instruments. Even though OXYGEN will recognize both systems at once, it will not be able to acquire any data from neither systems. The warning "**⚠️ Waiting for sync**" will be displayed in OXYGEN. Therefore, any created demo system must be removed when actual hardware is used.

### 6.2 Upgrade Chassis Controller License

With TRION R7.2, additional chassis controller hardware options for the TRION3 CONTROLLER can be activated remotely via a license file, eliminating the need to send in the device for upgrades.

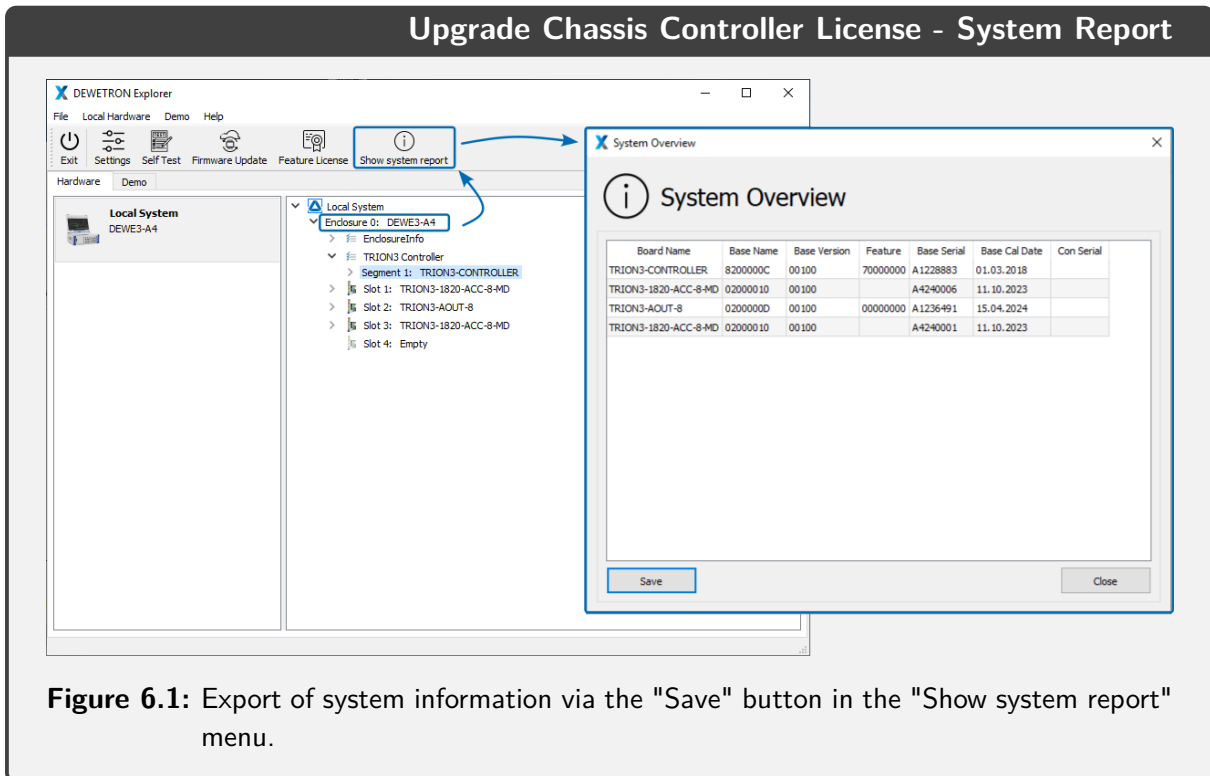
#### Requirements

A remote license upgrade requires that the chassis controller hardware is already installed in the DEWETRON device. Hence, ensure that the TRION3 CONTROLLER is already installed.

#### Step-by-step guide

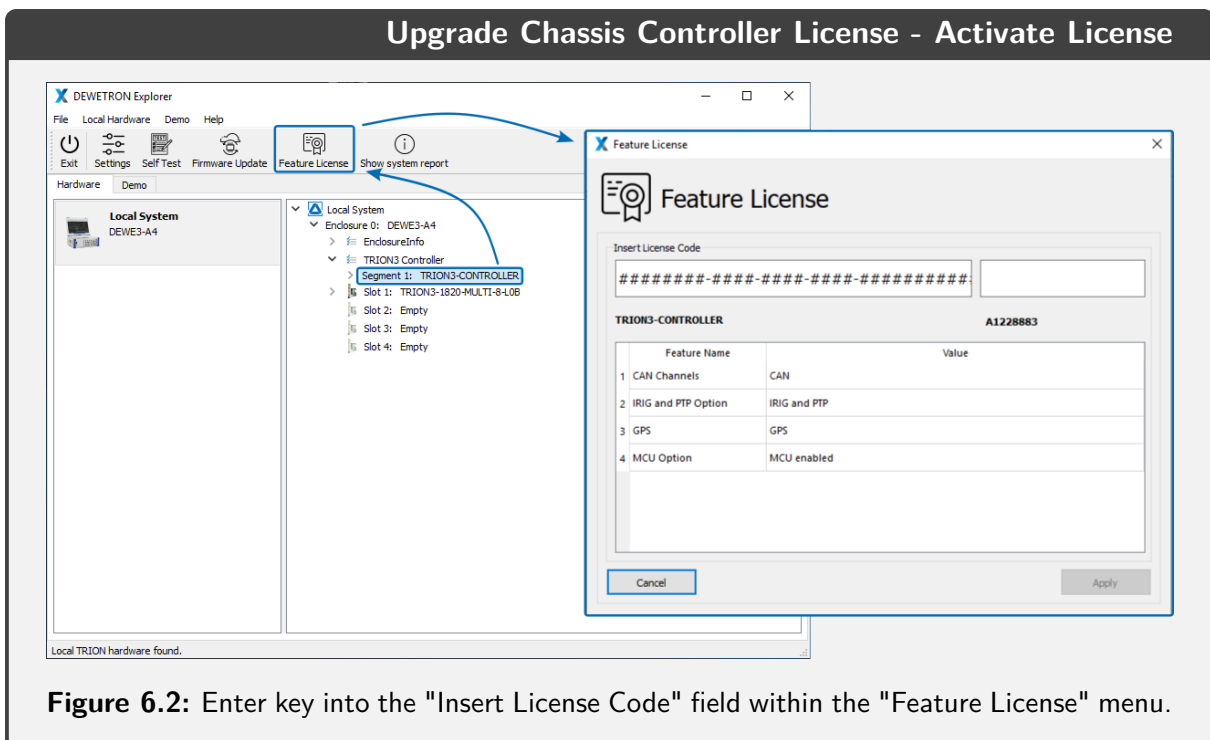
In order to create a license file, specific information about the system is required, which needs to be exported via the "Show system report" menu. Therefore:

1. Click on "Show system report" within the toolbar.
2. Click "Save" and export all system information to a \*.txt file.
3. Send the exported \*.txt file to DEWETRON as part of the upgrade order.



After successful submission of the upgrade order, you will receive a license file which needs to be installed. For a successful installation:

4. Selected the TRION3 CONTROLLER in the right panel of the hardware section.
5. Open the Feature License menu.
6. Enter the license key from the license file into the designated field.
7. Click "Apply" and the upgrade is then complete.



**WARNING**

Each license key is bound to the serial number and is therefore only valid for the respective chassis controller!