

# R&S®CampusDashboard

## Lab Configuration Software

### User Manual



This document describes the following products:

- R&S®Campus Dashboard (1337.9823.02)

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1178.8442.02 | Version 03 | R&S®CampusDashboard

Throughout this manual, products from Rohde & Schwarz are indicated without the ® symbol , e.g. R&S®Campus Dashboard is indicated as R&S Campus Dashboard.

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# 1 Introduction

## Installation

You can download the latest version of the Campus Dashboard software from the Rohde & Schwarz internet pages ([www.rohde-schwarz.com](http://www.rohde-schwarz.com)).

After the download, run the installer (CampusDashboardSetup<version>.exe) and follow the instructions.

## System requirements

Running the Campus Dashboard software requires the following hardware:

- Operating system: 64-bit Microsoft Windows 7 or higher.
- ≥ 3 GB RAM
- ≥ 300 MB space on the harddisk

## Demo mode

If you have no valid license, you can still use Campus Dashboard with the following restrictions.

- Configuration of a maximum of five instruments.
- Saving configurations is not possible.

## Licensing

Campus Dashboard licenses have the following order numbers:

- Local license: 1337.9817.02
- Floating license: 1337.9817.03

## Supported instruments

- Oscilloscopes
  - R&S®RTA4000
  - R&S®RTB2000
  - R&S®RTC1000
  - R&S®RTM3000
- Spectrum analyzers
  - R&S®FPC
  - R&S®FPH
  - R&S®FSC
  - R&S®FSH
- Power supplies
  - R&S®NGE100(B)
- Network analyzers
  - R&S®ZVH

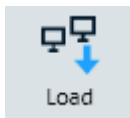
## 2 Classroom Configuration

Before you can begin to use the Campus Dashboard software, you have to create or restore a classroom configuration. A classroom configuration defines the layout of the classroom and defines the network connections to the instruments available in the classroom.

### Restore a classroom configuration

Campus Dashboard always starts with the classroom configuration that was active in the last session.

If you already have a classroom configuration, you can skip the following procedures, and restore one you have made previously. Alternatively, you can restore the [snapshot](#) of a classroom.



1. Restore a classroom:

- a) Select "Classroom" > "Load" from the toolbar.
- b) Select the configuration file you want to restore (.cds file type).



2. Restore a snapshot:

- a) Select "Classroom" > "Load Snapshot" from the toolbar.
- b) Select the snapshot file you want to restore (.cdt file type).

Campus Dashboard automatically tries to connect to all instruments in the classroom after you have loaded the configuration, snapshot or exercise.

Depending on the number of connected instruments, connecting to all instruments can take a while. You can speed up the connection process by making sure that all instruments have a physical connection and are running before loading a classroom configuration.

Usually, connecting to an instrument is fast, but if an instrument cannot be found, Campus Dashboard tries for a few seconds to establish the connection, before aborting the procedure. Campus Dashboard adds a list of failed connections to the "Notifications".

### Create a classroom configuration

If you have not configured a classroom yet, you have to create a new one.

The basic classroom configuration consists of four main steps as illustrated in the procedures below.

- ["Define the layout of the classroom"](#) on page 7
- ["Organize work benches"](#) on page 8
- ["Establish a LAN connection"](#) on page 9 (method 1)
- ["Establish a LAN connection"](#) on page 9 (method 2)
- ["Establish a LAN connection"](#) on page 10 (method 3)
- ["Review the configuration"](#) on page 11

The following guide configures a classroom whose benches are arranged in a U shape. Each bench has a spectrum analyzer and an oscilloscope.

### Define the layout of the classroom

The first configuration step is to define the classroom layout and the arrangement of work benches. The teacher work bench is always in the front of the classroom. This example defines a classroom in a U shape.

1. Select "Classroom" > "Edit".
2. Enter the number of work bench rows and work bench columns in the corresponding input field.

The number of rows and columns defines the basic layout of the classroom.

Benches in row "A" correspond to the first row in the classroom.

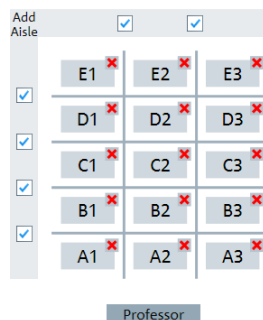
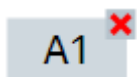


Figure 2-1: Basic classroom layout

A classroom can have up to 100 benches distributed over 50 rows and 50 columns.



3. In this example, the classroom has an irregular arrangement of work benches, in a U-shape.

Remove the redundant benches with the icon.

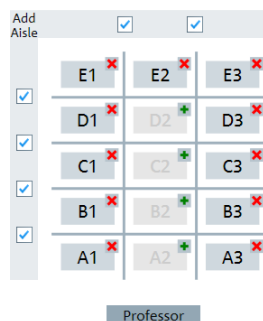
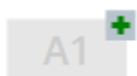


Figure 2-2: Classroom layout

Once removed, the bench becomes grayed out and cannot be configured anymore.



4. If you accidentally remove a bench, you can add it again with the icon.
5. Optional: Add or remove aisles between the work benches with the checkmarks. This feature is just a visual tool to illustrate the classroom in a more realistic way. Aisles have no effect on the configuration.

In this example, there is no space between the work benches.

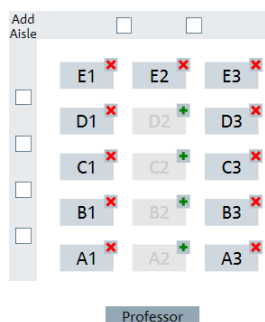


Figure 2-3: Final classroom layout

### Organize work benches

The second step is to define the instruments on each workbench. All work benches are assumed to be equipped with the same instrument categories. This example equips the work benches with a spectrum analyzer and an oscilloscope.

1. Select "Spectrum Analyzer" from the first dropdown menu.
2. Select "Oscilloscope" from the second dropdown menu.  
Note that a work bench can only have one of a certain category of equipment, for example only one spectrum analyzer.

Spectrum Analyzer	Oscilloscope
not defined	not defined
Bench	

Figure 2-4: Work bench configuration

Campus Dashboard supports the following instrument categories:

- Spectrum Analyzer
- Oscilloscope
- Power Supply
- Network Analyzer

Therefore, you can equip a work bench with a total of one spectrum analyzer, one oscilloscope, one power supply and one network analyzer.

3. When you are done configuring the work benches, select "Next".

The third step is to connect the instruments to the LAN. Campus Dashboard provides several methods to do that.



### License required

Establishing a LAN connection to more than 5 instruments requires a valid license.



## Establish a LAN connection

### Method 1: Search for instruments

1. Select the "Search" tab.
2. Select "Start Search" to search for all instruments in the subnet of the LAN.

Campus Dashboard populates the list accordingly.

Identify	Status	VISA Resource String/IP Address	Device Group	Device Type	Bench
<input type="checkbox"/>	N/A	TCPIP0:::inst0::INSTR			
<input type="checkbox"/>	N/A	TCPIP0:::inst0::INSTR			
<input type="checkbox"/>	N/A	TCPIP0:::inst0::INSTR			
<input type="checkbox"/>	N/A	TCPIP0:::inst0::INSTR			
<input type="checkbox"/>	N/A	TCPIP0:::inst0::INSTR			
<input type="checkbox"/>	N/A	TCPIP0:::inst0::INSTR			

Figure 2-5: Instrument search - results

3. Optional: Filter the results by a certain criterion by entering a string of characters.  
Campus Dashboard reduces the number of entries accordingly.
4. "Identify" the instruments.  
You can identify all instruments or select individual instruments for identification in the first column. Note that Campus Dashboard only identifies instruments supported by the software.  
The identification process queries the "Device Group" (for example "Spectrum Analyzer") and the device type (for example "FSH20") for the selected devices.
5. Assign each instrument to a bench from the dropdown menu in the last column.

Identify	Status	VISA Resource String/IP Address	Device Group	Device Type	Bench
<input checked="" type="checkbox"/>	OK	TCPIP0::fpc1000::rsint.net::inst0::INSTR	SpectrumAnalyz...	FPC1000	E1
<input type="checkbox"/>	N/A	TCPIP0::fpc1000::rsint.net::inst0::INSTR	SpectrumAnalyz...	FPC1000	E2
<input type="checkbox"/>	N/A	TCPIP0::fpc1000::rsint.net::inst0::INSTR	SpectrumAnalyz...	FPC1000	E3
<input type="checkbox"/>	N/A	TCPIP0::fpc1000::rsint.net::inst0::INSTR	SpectrumAnalyz...	FPC1000	D1
<input type="checkbox"/>	N/A	TCPIP0::fpc1000::rsint.net::inst0::INSTR	SpectrumAnalyz...	FPC1000	D3
<input type="checkbox"/>	N/A	TCPIP0::rsmb100a175876.rsint.net::inst0::IN...			

Figure 2-6: Instrument search - work bench assignment

Alternatively, drag one of the instruments to one of the benches on the classroom overview on the right.

## Establish a LAN connection

### Method 2: Manage network properties in an xml file


1. Select the "Load File" tab.
2. Select "Search File" to select an .xml file that contains the network properties of the instruments in the classroom. See ["xml schema"](#) on page 10 for an overview of the .xml file structure.
3. Select "Start Import" to populate the table.

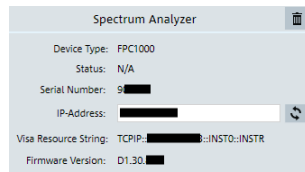
The bench assignment is part of the .xml file.

**xml schema**

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:vc="http://www.w3.org/2007/XMLSchema-versioning"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified"
  vc:minVersion="1.1">
  <xs:element name="DeviceList">
    <xs:annotation>
      <xs:documentation>Comment describing your root element</xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:sequence maxOccurs="unbounded">
        <xs:element ref="Device"/>
      </xs:sequence>
      <xs:attribute name="Version" type="xs:int" use="required"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="Device">
    <xs:complexType>
      <xs:attribute name="networkIdentification" type="xs:string" use="required"/>
      <xs:attribute name="row" type="xs:int" use="required"/>
      <xs:attribute name="column" type="xs:int" use="required"/>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

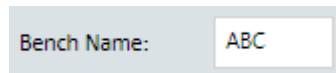
**Establish a LAN connection****Method 3: Manage each work bench individually**

1. Select the "Edit Bench" tab.
2. Select one of the work benches from the classroom overview on the right.  
The selected bench turns blue.
3. Enter the IP address for each instrument on the work bench in the corresponding input field.
4. Confirm your input with the  icon.  
Campus Dashboard automatically updates all other fields (device type, status, serial number etc.)  
If you have entered an unknown IP address or have connected to an instrument that is not supported, an error message is displayed.

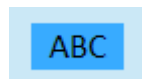


**Figure 2-7: Instrument assignment to a work bench**

- Optional: Rename the work bench.



The first input field next to the "Bench Name" label changes the abbreviation shown in the classroom overview. This name should not have more than three characters, because the overview does not display more characters.

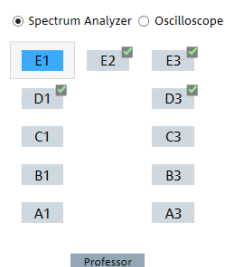


The second input field defines a longer description for the work bench.

- Confirm the input by selecting another bench.
- Repeat steps [step 2](#) to [step 6](#) for all work benches in the classroom.

### Review the configuration

- Check if the assignment of instruments to work benches is correct.
- Check the connection status of the work benches.
  - Green checkmark: Connection is fine.
  - Red cross: Connection has failed.



**Figure 2-8: Final classroom configuration**

- Optional: Reset the names of the work benches to their default values (A1, A2 etc.).
- Optional: Clear the assignment and start again.

5. "Finish" the classroom configuration to save it in a `.csd` file.

Upon finishing the configuration, Campus Dashboard enters the "Overview" dialog box that provides functionality to manage and control the instruments in the classroom.

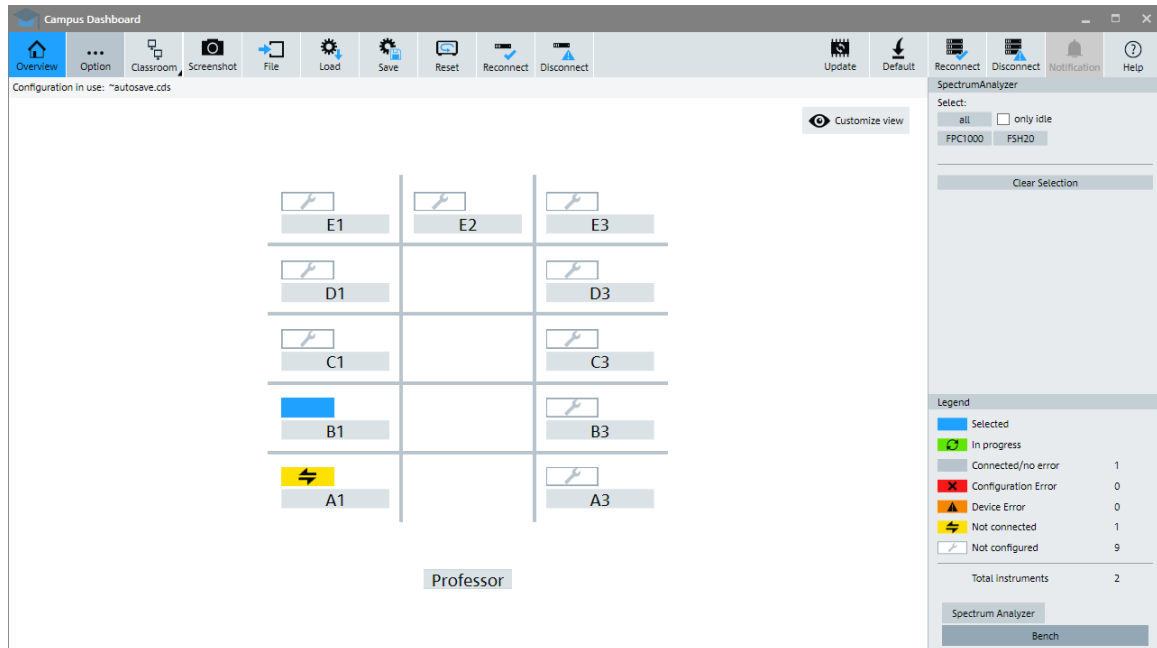
**License required**

Saving the classroom configuration requires a valid license.

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### 3 Classroom Management

The "Overview" dialog box contains various features to manage and control the instruments in the classroom.



**Figure 3-1: Classroom overview**

The layout of the classroom shows all instruments and work benches, including the state of the instruments.

- : Currently selected instrument.
- : Instrument is connected and usable.
- : Instrument is connected, but busy. This icon appears, for example, while Campus Dashboard establishes a connection to the instrument, when you update the instrument firmware or when you transfer files. After the instrument is done doing what it does, the icon disappears automatically.
- : Instrument was configured, but is not connected. You can reconnect the instrument(s) with the [corresponding icons](#) in the toolbar.
- : No physical instrument has been assigned to the work bench.
- : Instrument is connected, but an action on the instrument could not be executed successfully (for example a file transfer).
- : General instrument error that appears if the instrument on a certain IP address is not the expected instrument (different serial number or different instrument category and type).  
Example: You have assigned an R&S RTB to IP address 192.0.2.0, but Campus Dashboard detects an R&S RTC at that address.  
Note that this error also appears in demo mode for the 6th instrument and onward (demo mode only supports connection to 5 instruments).

### Take a snapshot of the classroom

A classroom snapshot contains the current classroom configuration and the status (measurement configuration) of all connected instruments in the classroom. Using a snapshot, you can interrupt a class and resume it at a later time. Restoring classroom and time-consuming instrument configuration is not necessary.

Campus Dashboard only includes an instrument in the snapshot if it can find it in the classroom. Before taking a snapshot, make sure that all instruments are running and are connected to the LAN.



#### License required

Saving a classroom snapshot requires a valid license.



1. Select "Classroom" > "Save Snapshot".

2. Define a file name to save the snapshot in a `.cst` file.

If Campus Dashboard cannot reach all instruments, for example because of a connection error, it shows a corresponding message. You can then decide if you want to save the snapshot anyway, or fix the issues before saving.

When you restore a snapshot, you can either restore the configuration for individual instruments, or for all instruments. Thus, you can restore the configuration for selected instruments at the beginning of the class, and add other instruments later, while the class is already running.

If the classroom configuration of the snapshot differs to the current classroom configuration (different layout or instruments), you can:

- Overwrite the classroom configuration with the one in the snapshot.
- Keep the current configuration and try to match the instruments in the snapshot to the ones in the current classroom. If you do so, Campus Dashboard tries to find the instruments based on the instrument identifiers (model, serial number), connect to these and restore the instrument configuration.

All instruments that it cannot find in the current classroom are ignored. You can find a list of instruments that were not found in the "Notification" area.

### Create an exercise

Exercises are based on savesets (or changesets) that you have previously made on an instrument. These savesets contain a certain measurement configuration for a certain instrument type in the classroom. You can use them to bring the instruments in the classroom into a desired state, for example as a starting point of a lesson.



1. Select "Classroom" > "Edit Exercise".

2. Add an exercise description.

3. Select an instrument type for which you want to create the exercise.

By default, all instruments in the classroom are displayed. If the instrument is not displayed, you can select type and model from the dropdown menus and add it with "Add Device".

4. Select an instrument type and model from the list and assign a saveset (folder icon).
5. Check all instruments you want to include in the exercise. Unchecked instruments are not part of the exercise.
6. Save the exercise in a `.cse` file.

### Restore an exercise

Restoring an exercise sends a certain measurement configuration to all instruments in the classroom (if they are part of the exercise). Note that restoring an exercise has no effect on the classroom configuration, it only brings the instruments in the classroom into a certain state.



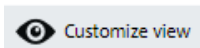
1. Select "Classroom" > "Load Exercise".

2. Select an exercise (`.cse` file).

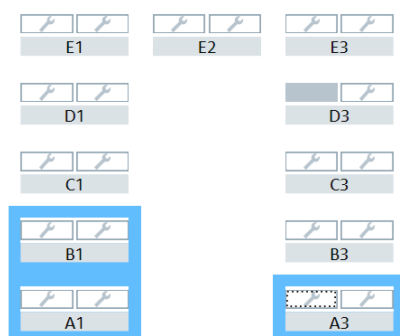
Campus Dashboard sends the measurement configuration to the instruments and checks if the work benches have all the equipment required for the exercise. You can check the "Notifications" to see if the transmission of the savesets has worked or if there were any errors (for example if the exercise requires an oscilloscope, but a workbench does not have one).

### Hide unused work benches

You can remove work benches that are not in use from the overview and thus keep the overview as simple as necessary.

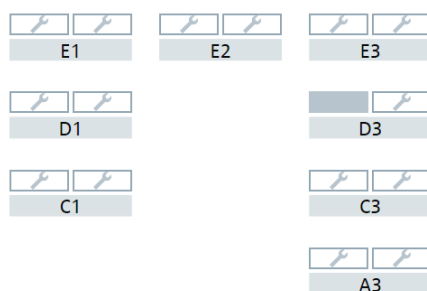


1. Select "Customize View" to enter the edit mode.
2. Select the work benches you want to hide.  
You can select more than one work bench by pressing either the Shift key (selects a block of work benches) or the Ctrl key (selects individual work benches).  
The selected work benches are highlighted blue.



**Figure 3-2: Hide work benches**

3. Select "Hide / Show Selected" to grey out the work benches.
4. Select "Customize View" again to remove the work benches from the overview.  
In this example, work benches A1, A3 and B1 are no longer displayed in the overview.



**Figure 3-3: Hidden work benches**

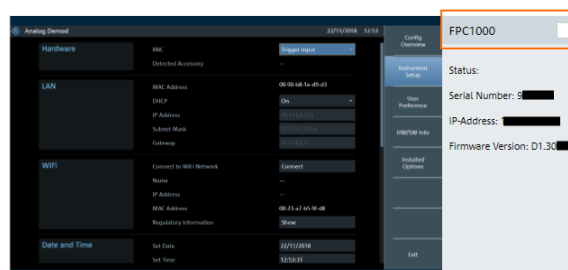
5. You can unhide the work benches any time in edit mode ("Customize View").

### Monitor work benches

Monitoring allows you to see what is happening on the instruments of a certain work bench. From the work bench view, you can also access individual instruments and control them.

1. Double-click on any work bench in the "Overview" dialog box to open the live view.  
The live view shows the contents of the instrument displays assigned to that work bench.





**Figure 3-4: Work bench view**

You can browse the work benches with the arrows at the top of the display or the dropdown menu at the top.

2. Select the check mark in the top right corner of the instrument display to access more functions in the [toolbar](#).



You can also access these features in the toolbar when you select an instrument in the "Overview" dialog box.

### Control instruments with the remote front panel

Controlling individual instruments allows you to access the functions of a certain instrument via remote front panel.

1. In the [live view](#), double-click on an instrument.
2. Control the instrument via the remote front panel. The remote front panel provides the same functionality as the real front panel.

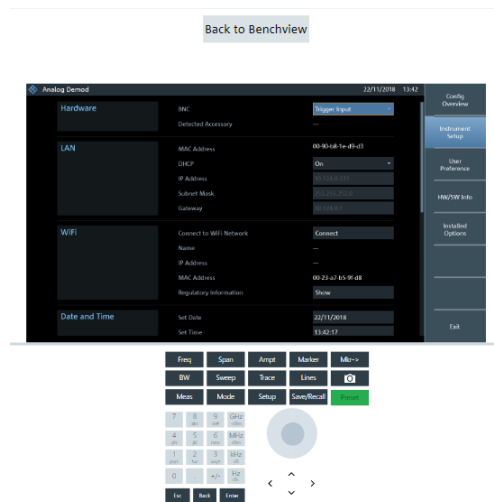


Figure 3-5: Remote front panel for the R&S FPC1000

Note that the remote front panel looks can have a different look and feel, depending on the instrument. Some instruments do not support the remote front panel at all.

### Control instruments with the toolbar

The toolbar contains several useful shortcuts for general instrument features. You could also do all these tasks via the [remote front panel](#), but using the toolbar is easier (for example the file transfer).

Some toolbar features apply to a single instrument.

Some toolbar features apply to a group of certain instrument models.

Some toolbar features apply to all instruments.

- Select one or more instruments in the classroom overview.  
Alternatively, you can select several instruments from the interface on the right.

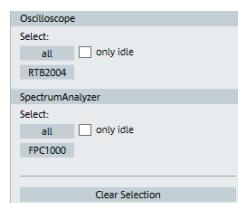


Figure 3-6: Instrument selector

In this interface, you can select:

- All instruments in the classroom.
- All instruments from a certain category in the classroom (for example all oscilloscopes).
- All instruments from a certain type in the classroom (for example all R&S RTB).

Depending on your selection, the corresponding instruments are highlighted blue. In addition, also depending on your selection, features in the toolbar become available.

### Take a screenshot

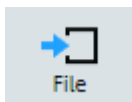
You can take a screenshot of the current display contents for one or more instruments in the classroom.



- ▶ Select the screenshot icon to take a screenshot of the instrument's display contents.  
Available for the selection of a single instrument or several instruments, regardless of category and type.  
For a selection of more than one instrument, this feature takes a screenshot of all selected instruments and stores them in the [default directory](#).

### Transfer a file

You can exchange files between a PC and a connected instrument.



- ▶ Select the "File Transfer" icon to transfer files.  
"Download" transfers files to a PC. "Upload" transfers files to the instrument.  
You can also "Delete" files.  
Available for the selection of a single instrument.

### Restore settings on an instrument

You can restore a specific configuration stored in a saveset on an instrument.



- ▶ Select the "Load Settings" icon to restore instrument settings.  
Available for the selection of a single instrument or several instruments of a certain type.

### Save an instrument configuration

You can save the configuration of an instrument.



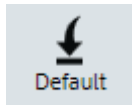
- ▶ Select the "Save Settings" icon to save the current instrument configuration.  
Available for the selection of a single instrument. Campus Dashboard stores the dataset in the [default directory](#).

### Reset instruments

You can restore the default or the factory configuration of the connected instruments.



1. Select the "Reset" icon to restore the default configuration of the selected instruments.  
Available for the selection of a single instrument or several instruments, regardless of category and type.



2. Select the "Factory Default" icon to restore the factory settings of the instrument.  
Available for the selection of a single instrument or several instruments, regardless of category and type.

### Reconnect to instruments

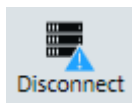


- Select the "Reconnect" icon to connect to instruments.  
Available for the selection of a single instrument or several instruments, regardless of category and type.  
(You can also use "Reconnect All" to connect to all instruments in the classroom, without selecting individual instruments.)

Depending on the number of connected instruments, connecting to all instruments can take a while. You can speed up the connection process by making sure that all instruments have a physical connection and are running before loading a classroom configuration.

Usually, connecting to an instrument is fast, but if an instrument cannot be found, Campus Dashboard tries for a few seconds to establish the connection, before aborting the procedure.

### Disconnect from instruments



- Select the "Disconnect" icon to cut the connection to instruments.  
Available for the selection of a single instrument or several instruments, regardless of category and type.  
(You can also use "Disconnect All" to cut the connection of all instruments in the classroom, without selecting individual instruments.)

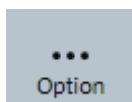
### Update the instrument firmware



- Select the "Firmware Update" icon to update the instrument firmware.  
Available for the selection of a single instrument or several instruments of a certain type.

### Define default directories

You can define default directories for various file types.




- Select the "Options" icon from the toolbar to open the "Options" dialog box.  
Define the default locations for the following file types.
  - "Firmware Update Files": Location of the files necessary to update the firmware of the instruments.
  - "Configuration Files": Location of the classroom configuration files.
  - "Screenshots": Location for screenshots.
  - "Device Savesets": Location for savesets that contain an instrument configuration.

## 4 Troubleshooting

### I cannot save the classroom configuration

1. Check if you have a valid license ("Options" > "License Server Manager").  
(Alternative: ("Start" menu > "R&S License Server" > "R&S License Server Manager"))
2. Check if the dongle is connected.
  - Local license: Connect the dongle to the PC Campus Dashboard is running on.
  - Floating license: Connect the dongle to the local PC or the floating license server PC. Make sure that the floating license server is set up correctly.  
For a floating license, check that no one else is using the license.
3. Check if there is enough free space on the hard disk.


### I am getting a device error

A device error () indicates that the last action that Campus Dashboard tried to do on the connected instrument has failed. Basically, you can ignore device errors and resume working with the software as if nothing happened. The next action should work again.

However, you can check the details of the device error.


1. Open the "Notifications".  
The notifications contain a log of all issues that occurred during operation of Campus Dashboard.  
You can also check the tooltip on the device that shows the error (hover the mouse pointer over the faulty device).
2. Alternatively, [reset](#) the instrument.

### I am getting a configuration error

A configuration error () indicates an issue with the network configuration of the connected instrument.

1. Open the "Notifications".  
The notifications contain a log of all issues that occurred during operation of Campus Dashboard.  
You can also check the tooltip on the device that shows the error (hover the mouse pointer over the faulty device).
2. Fix the network configuration in the [configuration wizard](#).

### I am getting a connection error

A connection error () indicates an issue with the LAN connection.

1. Try to [reconnect](#) to the instrument.

2. If a reconnect operation does not work, check if the instrument is actually running and connected to the LAN.
3. Check if the instrument has a valid IP address and a valid VISA resource string.

### **I want to use a floating license**

For a detailed description, refer to the documentation that comes with the installation of the R&S License Server.

("Start" menu > "R&S License Server" > "Options" > "License Server" > "Help")

1. Connect the license dongle to a PC that acts as the server.
2. Install the R&S License Server on the server PC.  
Alternatively, install Campus Dashboard. This also installs the R&S License Server.
3. Create a file named `RsLicenseServerApp.json` with the contents shown below.
4. Copy the file to each computer using the floating license to the following directory.  
`%ProgramData%\Rohde-Schwarz\LicenseServer\config\RsLicenseServerApp.json`

```
{
  "config" : {
    "port" : 9443,
    "server" : [
      {
        "description" : "<<QuickDescription>>",
        "address" : "<<ServerDNS:IPAddress>>",
        "port" : 9443,
        "rport" : 9444,
        "ignore" : false
      }
    ]
  }
}
```

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