

## **CHAPTER 5**

# **OPERATING**



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# 1 Operating Options

The transmitter is controlled using the R&S NetCCU800. The R&S NetCCU800 can be operated in the following ways:

- Local operation via the display and menu keys on the front panel of the R&S NetCCU800
- Operation via the web browser
- Monitoring and control via SNMP

If the unit is operated via the web browser of a connected PC/client computer, two modes are possible:

- Remote operation via a directly connected PC (connector on front panel)
- Remote control via a remotely connected network client (connector on rear panel)

## 1.1 Local Operation

### 1.1.1 Menu Keys



*Fig. 1 Menu operation*

Key	Meaning / function
<b>MENU</b>	Starts the menu control function (activation from the system overview); calls a context menu (activation from menu)
<b>BACK</b>	Cancels an entered value if not confirmed with <b>OK</b> ; used to move one step back in the menu
<b>HOME</b>	Used to return from the menu tree to the system overview.
<b>FUNCTION</b>	Calls a context menu for the current menu entry
<b>OK</b>	Confirms an entry or selection

Key	Meaning / function
<b>STATUS</b>	Displays the system logbook (when activated from the system overview); displays the status screen for a system component (when activated after selecting a system component from the menu)
<b>CURSOR KEYS</b> ↔⇨⇧⇩	Used to move through the menu structure and to highlight menu elements; used to select entries

## 1.1.2 Operating Structure

### 1.1.2.1 Navigation in Menu System

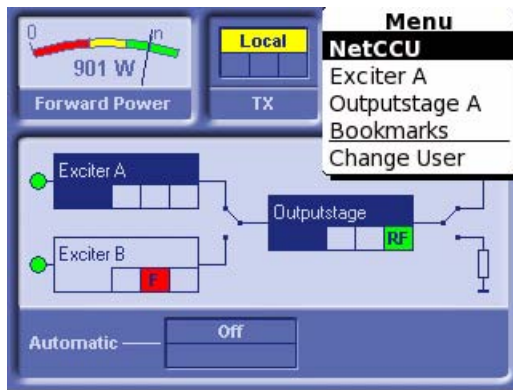
*Note* Different entry screens and menus are displayed depending on whether the R&S NetCCU800 is used as a NetCCU (transmitter control) or as an NCU/NSU (control of low-power transmitters / control of n+1 systems).

This is how you navigate within the menu system:

1. Press the **MENU** key.

The menu is called.

*Note* When you access the menu system for the first time, you are logged on by default under the user ID **Operation** which authorizes you to make settings that directly affect transmitter operation.



2. Select the required menu and confirm with **OK**.

The overview for the selected menu is then opened (here **NetCCU**).





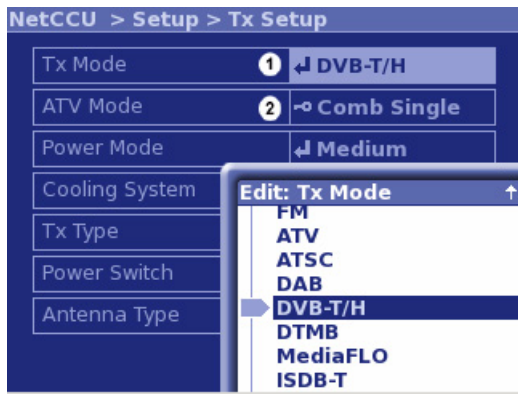
- 1) Window and title bar for higher-level menus
- 2) Window and title bar for lower-level menus (submenus of the main menu selected in the window at the left)
- 3) Window and title bar with explanation of currently selected menu
- 4) Menu contains additional submenus (no arrow symbol: a menu window will open)
- 5) Not all available menus are displayed (use cursor keys to scroll up/down)

3. Using the cursor keys in the left/right part of the window, select a menu and confirm with **OK**.

If additional submenus are available, the higher-level menus are shown in the left-hand window and the lower-level menus are shown in the right-hand window.

4. Using the cursor keys (up/down), select another menu or menu window from the right side of the window and confirm with **OK**.

Using the cursor keys (up/down), select an entry in the menu window and confirm with **OK**.



- 1) The entry can be edited.
- 2) The entry cannot be edited (no authorization (logon) or setting not possible in this constellation)

By using the **MENU** or **FUNCTION** key, you can call up a context menu from any position.

Use the **BACK** key to go back one step in the menu structure (even from the Help windows); you can also use **BACK** to cancel an entered value as long as you have not already confirmed it with **OK**.

Use the **HOME** key to exit the menu structure and return to the system overview.

### 1.1.2.2 Selecting and Editing Entries

The possibility of changing settings is controlled by a user administration facility with authorization system (see the section "User Administration") and a local/remote concept which is valid for the entire transmitter.

#### Local and Remote operating modes

*Local* means the transmitter can be configured onsite. Local access is available via the display on the front panel of the R&S NetCCU800 or by PC via the local Ethernet port.





*Remote* means the transmitter can be configured offsite. Remote access is available via the remote port on the transmitter.

Since local and remote operation are mutually exclusive, configuration work carried out onsite cannot collide with settings entered remotely. However, it is always possible to view transmitter settings.

The **Local** key on the R&S NetCCU800 is used to switch between the local and remote operating modes.

#### Locked and variable settings

Depending on the user rights concerned and the type of access (local or remote access) some or all processing parameters can be locked. These include restrictions arising from the actual constellation chosen. An appropriate symbol in front of the parameter value shows whether or not a parameter can be changed at this time.

Symbol	Meaning
	The present user can change the setting. A change takes effect straight away.
	The present user can change the setting. For the change to take effect, a restart of the R&S NetCCU800 <sup>a)</sup> (and possibly the exciter <sup>b)</sup> ) must be carried out.
	The setting cannot be changed at the present time. Possible reasons: <ul style="list-style-type: none"> <li>– The user does not have the necessary rights. <sup>c)</sup></li> <li>– Access is via the remote port when the R&amp;S NetCCU800 is in local mode.</li> <li>– Access is local when the R&amp;S NetCCU800 is in remote mode.</li> </ul>
	Setting is not possible in this constellation.
- none -	This parameter value is for a display; it cannot be set.

a) To restart the R&S NetCCU800, run the Restart command in the SW Maintenance context menu.

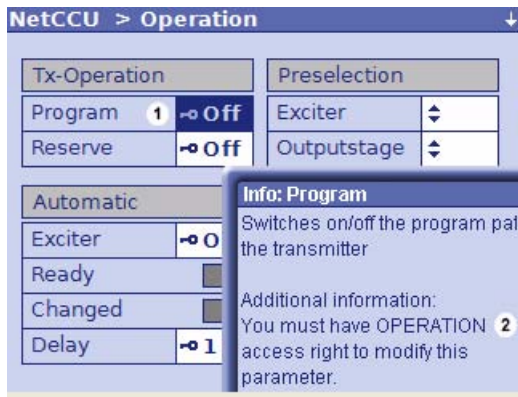
b) If the parameter identified in this way is a setting for the exciter (Exciter ..... menu path), the exciter must be restarted and then the R&S NetCCU800. To restart the exciter, run the Reboot Tx command in the Tx Setup context menu (Exciter menu).

c) The Info command from the context menu gives information on the necessary user rights among other things.

*Examples:*

Parallel IO	1	↓ disabled
Inhibit Status	2	↕ yes

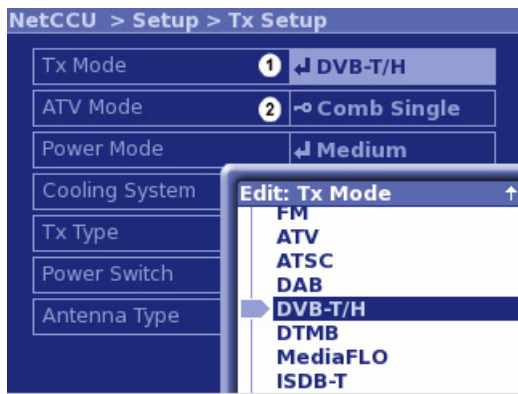
- 1) Setting can be changed, but the R&S NetCCU800 needs to be restarted
- 2) Setting can be changed; a change takes effect straight away



- 1) Due to insufficient user rights, the selected parameter cannot be changed at this time
- 2) Operation access rights are needed in order to change this setting

**Selecting entries**

The **Edit ...** selection window is displayed as soon as you click **OK** to confirm a field that provides a choice.



- 1) The entry can be edited.
- 2) The entry cannot be edited (no authorization (logon) or setting not possible in this constellation)

1. Using the cursor keys (up/down), select an entry in the **Edit ...** selection window.
2. Confirm the selection with **OK**.

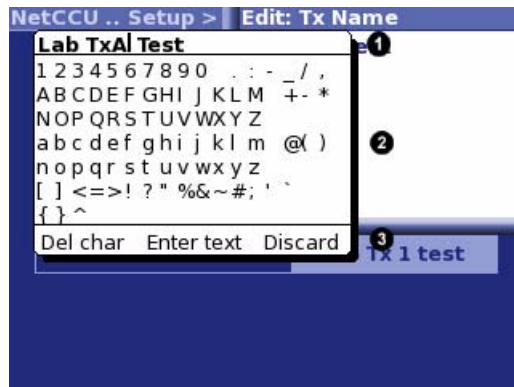
Your selection is saved and the **Edit ...** selection window closes.

Use the **HOME** key to finish editing the menu.

**Editing entries**

The editor is displayed as soon as you click **OK** to confirm a field that can be used to enter customized text or numbers.

**Note** *The "Selectable characters" area of the editor only ever offers you the characters needed for the box you selected (e.g. only numbers and a point for entering an Ethernet address).*



- 1) *Entry line*
- 2) *Selectable characters*
- 3) *Command line*

Entering characters:

1. Use the arrow keys to place the cursor at the desired position on the "entry line".
2. Using the cursor keys, select the required character from the "Selectable characters" area and confirm with the **OK** key.

The selected character appears in the "entry line".

Deleting characters:

1. Use the arrow keys to place the cursor at the desired position on the "entry line".
2. Use the cursor keys to select **Del Char** from the "command line" and confirm with **OK**.

Characters in the "entry line" are deleted starting at the cursor position and going from right to left.

Saving or rejecting changes:

1. To save changes (current entry in the entry line), use the cursor keys to select **Enter text** from the "command line" and confirm with **OK**.

Your changes are saved and the editor closes.

**Note** *If you want the editor to stay open after saving (e.g. when testing settings), select **Fix Editor** from the context menu. The editor then stays open until you close it by pressing the **Back** key.*

or

To close the editor without saving the changes, use the cursor keys to select **Discard** from the "command line" and confirm with the **OK** key.

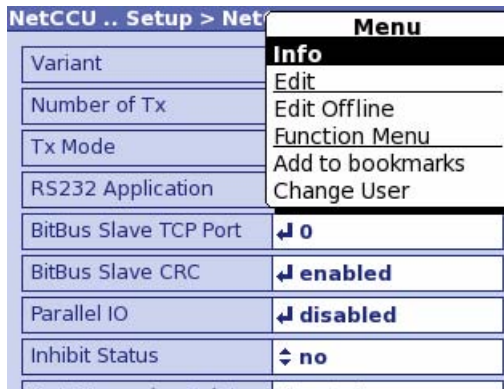
The editor closes and your changes are not saved.

Use the **HOME** key to finish editing the menu.

### 1.1.2.3 Context Menu

The context menu contains function- and content-oriented commands which can be applied to the currently displayed menu.

The context menu can be called from any position using the **MENU** key.



You can find the content-oriented commands in the description for the menu window concerned. The function-oriented commands are listed and described below:

Command	Explanation
Change User	Used to change the user profile
Info	Help text for the menu window or menu entry concerned; also, in the case of menu entries, information on which user rights are needed in order to make changes
Open	Used to open a menu/menu window (alternative to the <b>OK</b> key)
Edit	Used to edit a menu item (alternative to the <b>OK</b> key)
Submit Changes	Used to save changes made offline
Edit Online	Used to edit a menu item online; standard setting which can only be changed by selecting Edit Offline
Enter Text	In editor only: Used to save entries (alternative to the 'Enter text' command in the editor command line)
Discard	In editor only: Used to discard entries (alternative to the 'Discard' command in the editor command line)

Command	Explanation
Fix Editor	In editor only: The editor remains open for further editing after entries have been saved or discarded
Add to bookmarks	The current menu window is saved as a bookmark; the menu windows can be opened directly using the menu item "Bookmarks" in the Status window
Bookmarks (in System Overview only)	In System Overview only: Menu windows saved as bookmarks can be opened directly
Trigger	Used to trigger a change (same as <b>OK</b> key)
Function Menu	Used to display the Status > Tx Status menu

## 1.2 Remote Operation or Remote Control

Remote control (e.g. via a network) and remote operation (e.g. via a PC) both require a web browser.

**Note** *Depending on their rights, logged-on users can monitor the transmitter in question or control all of its functions. There is no difference between remote operation and remote control with respect to this functionality.*

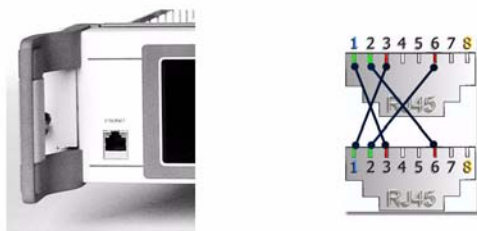
As standard, the R&S NetCCU800 contains the necessary components for remote operation and remote control:

- Network connector (10/100 Mbit)
- Network card (RJ-45)
- RJ-45 crossover cable

### 1.2.1 Installation and Configuration

#### Connecting a PC/network client

1. Using an RJ-45 crossover cable, connect the Ethernet socket on the front panel of the R&S NetCCU800 to a local PC.

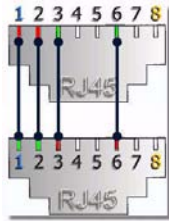


**Fig. 2** Ethernet link using a crossover cable connection

or

Using an RJ45 1:1 cable, connect the **X100A** socket on the transmitter roof to the station network.

Network clients can communicate with the transmitter via the **NETLINK** interface (**X5**), which is connected to **X100A**, on the rear panel of the R&S NetCCU800.



**Fig. 3** Link to a network using an RJ-45 1:1 cable connection

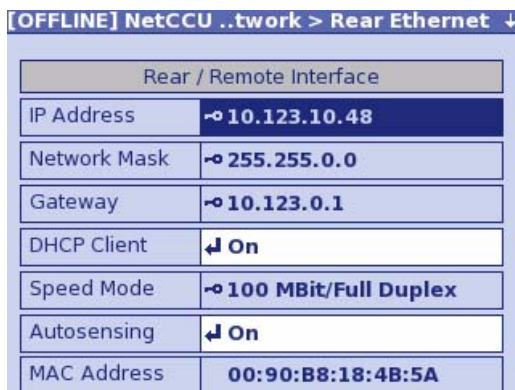
**Entering IP address at R&S NetCCU800**

Before you can use a browser to connect to the R&S NetCCU800 via the connector on the rear panel of the R&S NetCCU800, you must enter the IP address required for communication directly via the front panel of the R&S NetCCU800 or have the IP address assigned automatically. To permit this, the R&S NetCCU800 must be set to local mode (press the **Local** key so that the appropriate LED lights up).

The parameters for connection to the front panel of the R&S NetCCU800 are preset and cannot be changed.

**Note** *The R&S NetCCU800 has an integrated DHCP client to allow automatic address assignment. For automatic integration into a network, the network must contain a DHCP server.*

1. Select the menu **NetCCU > Setup > NetCCU Setup > Network > Rear Ethernet** at the front panel of the R&S NetCCU800.



**Fig. 4** Entering IP address data

2. From the context menu, select the **Edit Offline** mode.
3. To assign the required IP address data automatically, select the **ON** switch position under **DHCP Client**.

*or (for manual entry)*

Select the **OFF** switch position under **DHCP Client** and enter the parameters **IP Address**, **Subnet Mask** and **Gateway**.

4. In the context menu, select **Submit Changes**.

The changes will be made.

### **Configuring the browser**

Before you can operate the R&S NetCCU800 via your browser, the following conditions must be satisfied:

- Javascript must be enabled.
- "Java Platform Standard Edition" must be installed and activated.

**Note** *If you are still using an older software version on the R&S NetCCU800, you may sometimes have to enable setting of cookies. From version 1.11.0 and higher, however, this is no longer necessary.*

The next section uses Microsoft Internet Explorer to explain how you can check whether these conditions have been met or what changes you need to make.

**Note** *Please note that the settings described here need not necessarily match your current browser settings one hundred percent.*



#### **ATTENTION!**

Please note that the modified settings described here may adversely affect the security of your Internet connections.

The necessary changes and settings can be found in the **Tools > Internet Options** menu on your Internet Explorer.

#### *Checking and adapting the settings for Java Applets*

1. Select the **Security** tab.
2. For the Internet zone select the **Custom Level** option.
3. In the tree structure go to **Scripting > Scripting of Java applets** and select the **Enable** option.

#### *Installing Java (Sun) JRE if necessary; checking and adapting the settings*

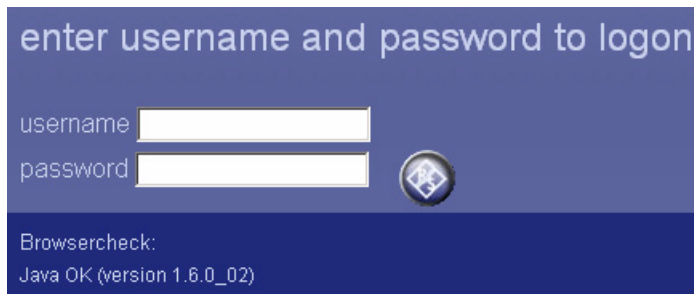
1. Select the **Advanced** tab.
2. Check whether the entry **Java (Sun) JRE ...** is present and enabled.
3. If necessary, download and install (standard installation) the Java Runtime Environment from the Sun website "www.java.com".
4. Then select the Internet Explorer's **Advanced** tab again and check whether the software is installed and enabled.



**Launching program**

**Note** To be able to operate the R&S NetCCU800 via a PC connected to the **front panel**, the R&S NetCCU800 must be set to local mode (press the **Local** key so that the appropriate LED lights up).

1. Start the browser on your PC or client.
2. Enter the same IP address as you entered at the R&S NetCCU800.  
The login screen appears.



3. Log on using the ID you require and confirm with **OK**.  
The corresponding entry screen appears.

**Factory-set user IDs**

User ID	Authorization	Password
Configuration	Allows you to set basic transmitter parameters; e.g. setup	1234
Maintenance	Allows you to perform maintenance tasks; e.g. software update	1234
Operation	Allows you to make settings that directly affect transmitter operation	1234
Query	Read-only authorization	1234
Guest	Read-only authorization – see Query	1234
Config-Engl	Same as Configuration authorization; this ID also changes the menu language to English (irrespective of the preset language, e.g. Chinese)	1234
Superuser	For configuring, creating and deleting user profiles, and for displaying and deleting active sessions; no authorization for setting transmitter parameters – see Query	1234

**Note** The IDs *Superuser* and *Guest* are only available for the web browser.

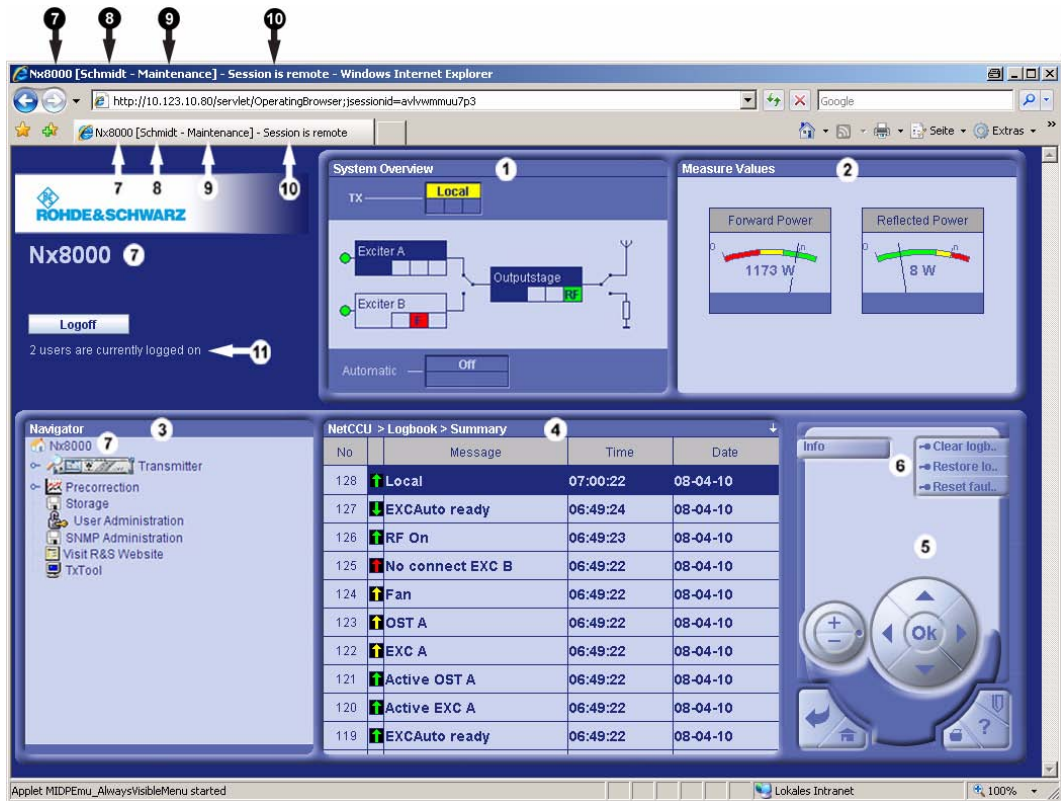
**Can't log on?**

Logging on can fail for the following reasons:

- Three other users already logged on via the web browser. The maximum permitted number of simultaneous sessions has been reached. On the other hand it is always possible to log on as Superuser.
- Incorrect ID and/or password entered.  
After three failed attempts at logging on, the requesting IP address is prevented from logging on for 30 minutes.

## 1.2.2 Browser-Based Operation

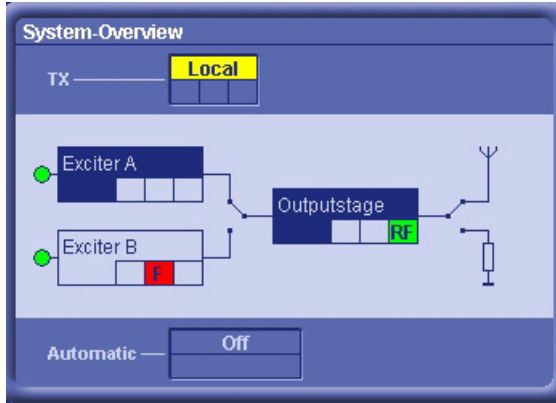
When you log on, the following entry screen will appear:



- 1) System Overview: current transmitter status
- 2) Measure Values: display of the forward and reflected power
- 3) Navigator: display and navigation through the transmitter menus
- 4) Menu window: displays the menus selected in the navigator
- 5) Control panel: Elements for navigating within the menu system and displaying and editing menu entries
- 6) Context menu (in this example the remotely logged on user cannot run any commands (key symbol), since the R&S NetCCU800 is in local mode)
- 7) Transmitter name display
- 8) User name display (according to login details)
- 9) Group membership display (authorization level)
- 10) Session type display: In the case of "Session is remote" the user logged on via the remote Ethernet port; in the case of "Session is local" the user logged in via the local Ethernet port
- 11) Total number of users logged on via web browser

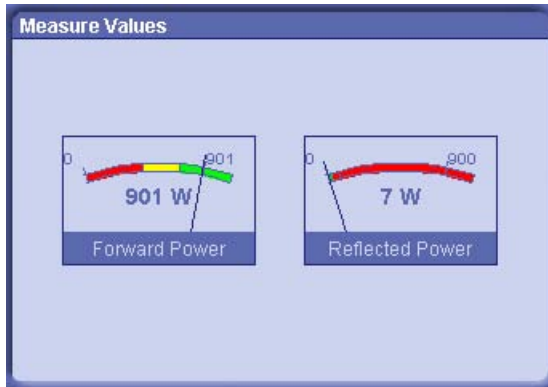
### System Overview

The **System Overview** window provides an overview showing the current status of the transmitter and its components.



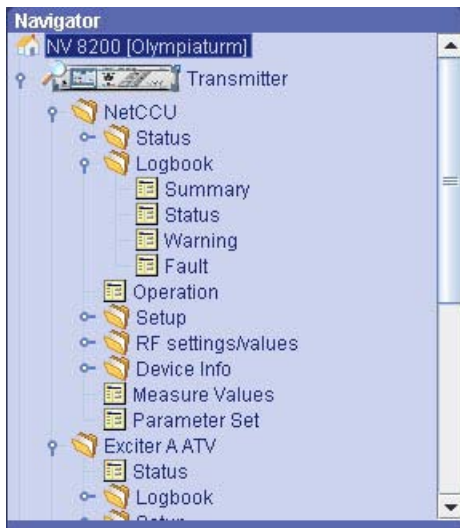
**Measure Values**

The current forward power and reflected power are displayed in the **Measure Values** window.



**Navigator**

The Navigator shows the menus of all transmitter components. You can open individual folders or menus under **Transmitter** by double-clicking them. The selected menus are displayed in the menu window.

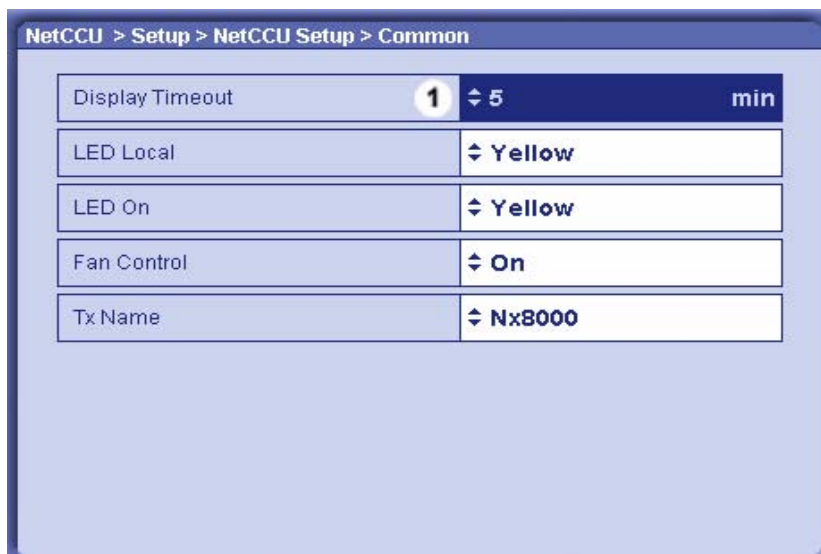


You can also call up the following functions in the Navigator:

Function	Explanation
Bookmarks	Display of all bookmarks: you can go directly to the selected menu window by double-clicking or by selecting <b>Open</b> in the context menu
Transmitter	Starts operation of the transmitter menu
Precorrection	Initiates calibration of the exciters
Storage	Saves and imports the parameter settings
Backup / Restore	Externally backs up and restores the system settings (including operating system)
User Administration	Calls up the user administration function
SNMP	Downloads and saves MIBs
Language Properties	Downloads, installs and uninstalls customer-specific language versions
Visit R&S Website	Link to the R&S website
Legal Notices	Information regarding license agreements
TxTool	Calls up the TxTool

### Menu window

The menu selected in the **Navigator** window is displayed in the menu window.



1) *Double-arrow symbol: The entry can be changed*

**Control panel**

You can use the control panel to navigate within the menu structure and menus and to change settings in the menu window. You can activate the individual control elements with the mouse or keyboard.





- 1) *For switching between menu entries, for accessing editable values and for entering numerical values; each click on the cursor keys (up/down) increments or decrements the number (corresponding to the cursor keys on the keyboard)*
- 2) *For editing (change to editing mode) and confirming settings (corresponds to the enter key on the keyboard)*
- 3) *Corresponds to the UP and DOWN cursor keys*
- 4) *Used for quickly switching between menu items, for quickly accessing editable values and for quickly entering numeric values; can be rotated using the mouse*
- 5) *Generally used to move one level back in the menu structure; also used to cancel settings that have not yet been confirmed with OK*
- 6) *Return to home menu*
- 7) *Displays the context menus for the current menu window or menu item (standard context menus: Info: help texts together with, in the case of menu items, information on which user rights are needed in order to make changes; Open: opens a menu or menu item; Edit: for editing an entry; Edit Offline: the item can be edited without the change being applied immediately; Submit Change: submits an item edited offline); see also Context Menu under Local Operation*
- 8) *Not enabled in this software version*

**Locked and variable settings**

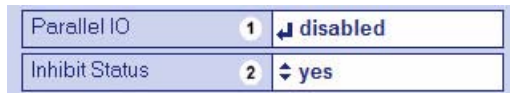
Depending on the user rights concerned and the type of access (local or remote access) some or all processing parameters can be locked. These include restrictions arising from the actual constellation chosen. An appropriate symbol in front of the parameter value shows whether or not a parameter can be changed at this time.

Symbol	Meaning
↕	The present user can change the setting. A change takes effect straight away.
↩	The present user can change the setting. For the change to take effect, a restart of the R&S NetCCU800 <sup>a)</sup> (and possibly the exciter <sup>b)</sup> ) must be carried out.

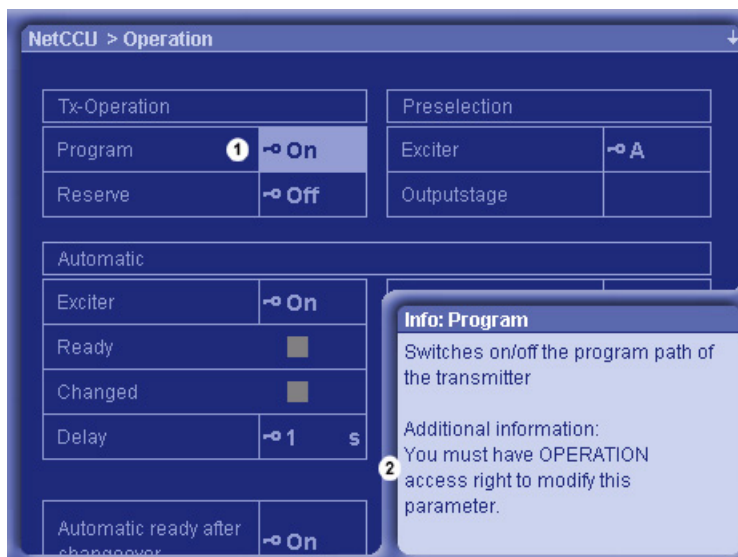
Symbol	Meaning
	The setting cannot be changed at the present time. Possible reasons: – The user does not have the necessary rights. <sup>c)</sup> – Access is via the remote port when the R&S NetCCU800 is in local mode. – Access is local when the R&S NetCCU800 is in remote mode.
	Setting is not possible in this constellation.
- none -	This parameter value is for a display; it cannot be set.

- a) To restart the R&S NetCCU800, run the Restart command in the SW Maintenance context menu.
- b) If the parameter identified in this way is a setting for the exciter (Exciter ..... menu path), the exciter must be restarted and then the R&S NetCCU800. To restart the exciter, run the Reboot Tx command in the Tx Setup context menü (Exciter menu).
- c) The Info command from the context menu gives information on the necessary user rights among other things.

**Examples:**



- 1) Setting can be changed, but the R&S NetCCU800 needs to be restarted
- 2) Setting can be modified; any change will take effect immediately

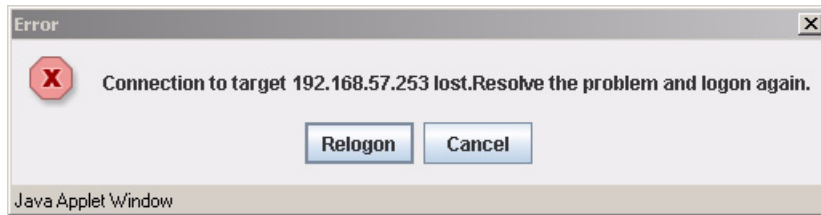


- 1) The selected parameter cannot be modified at this time (due to insufficient user authorization)
- 2) Operation rights are needed to modify the setting

**1.2.2.1 End of Session**

Use the **Logoff** button to log off from the system correctly. If you close the browser window without logging off, the session is automatically terminated after two minutes at most.

If the present connection was cut (e.g. because the unit was restarted), a popup window tells you that you need to log on again. Logging on again opens a new session.



**Note** *The IP address displayed in the popup window can vary depending on the system and setting.*

## 1.3 User Administration

The user administration facility is available in conjunction with browser-based operation. The settings that you make in the user administration facility are (provided that no password is required) also valid for menu access via local operation.

You can use the user administration facility to

- change user profiles (users and access rights)
- create new user profiles
- delete user profiles
- close active sessions

The ID **Superuser** with the factory-set password **1234** gives you extensive user administration rights.

1. Log on as Superuser.
2. Select **User Administration** in the **Navigator** window.  
The processing options and a list of existing users are displayed.



You are currently logged on as Superuser

[Add new user](#)  
[Change selected user](#)  
[Delete selected user](#)  
[Show session list](#)

Select	Name	Logged on	Web browser	Front panel	Access right	Is admin
<input checked="" type="radio"/>	Superuser	2 times	Yes	No	Query	Yes
<input checked="" type="radio"/>	Guest	No	Yes	No	Query	No
<input checked="" type="radio"/>	Configuration	1 times	Yes	Yes	Configuration	No
<input checked="" type="radio"/>	Config-Engl	No	Yes	Yes	Configuration	No
<input checked="" type="radio"/>	Maintenance	No	Yes	Yes	Maintenance	No
<input checked="" type="radio"/>	Operation	1 times	Yes	Yes	Operation	No
<input checked="" type="radio"/>	Query	No	Yes	Yes	Query	No
<input checked="" type="radio"/>	Mueller	No	Yes	Yes	Operation	Yes

Display	Meaning
Select	Selects the user to be processed
Name	User ID
Logged on	The user is not logged on ( <b>No</b> ) or is logged on once/several times ( <b>X times</b> ) at the system
Web browser	The user ID and authorization permit operation via the web browser ( <b>Yes, No</b> )
Front panel	The user ID and authorization permit local operation ( <b>Yes, No</b> )
Access right	Authorization to access transmitter parameters
Is Admin	Additional user administration authorization (configuration, creation and deletion of user profiles)

The following users are factory-set. Only the password can be changed for these users.

User ID	Authorization	Password
Configuration	Allows you to set basic transmitter parameters; e.g. setup	1234
Maintenance	Allows you to perform maintenance tasks; e.g. software update	1234
Operation	Allows you to make settings that directly affect transmitter operation	1234



User ID	Authorization	Password
Query	Read-only authorization	1234
Guest	Read-only authorization – see Query	1234
Config-Engl	Same as Configuration authorization; this ID also changes the menu language to English (irrespective of the preset language, e.g. Chinese)	1234
Superuser	For configuring, creating and deleting user profiles, and for displaying and deleting active sessions; no authorization for setting transmitter parameters – see Query	1234

### 1.3.1 Creating, Changing and Deleting Users

#### Creating users

1. Select **Add new user**.

2. Create the required user profile.

Entry/selection	Explanation
Name:	User ID (case-sensitive)
Password:	Must be at least 6 characters in length (case-sensitive)
Retype password:	Enter the password again (case-sensitive)
Web browser	The user ID permits menu access via the web browser
Front panel	The user ID permits local operation

Entry/selection	Explanation
Access right	Selects a factory-set authorization level
Is admin	The user is also given user administration rights (configuration, creation and deletion of users; no access to the user profiles <b>Super-user</b> and <b>Guest</b> )

3. Confirm your entries with **Add user**; clicking **Reset** discards your entries.

**Changing users**

*Note* All users have the right to change their own password.

1. Mark the required user.
2. Select **Change selected user**.



3. Change the user profile in the way described under "Creating users".
4. Confirm your changes with **Change User**; clicking **Reset** discards your changes.

**Deleting users**

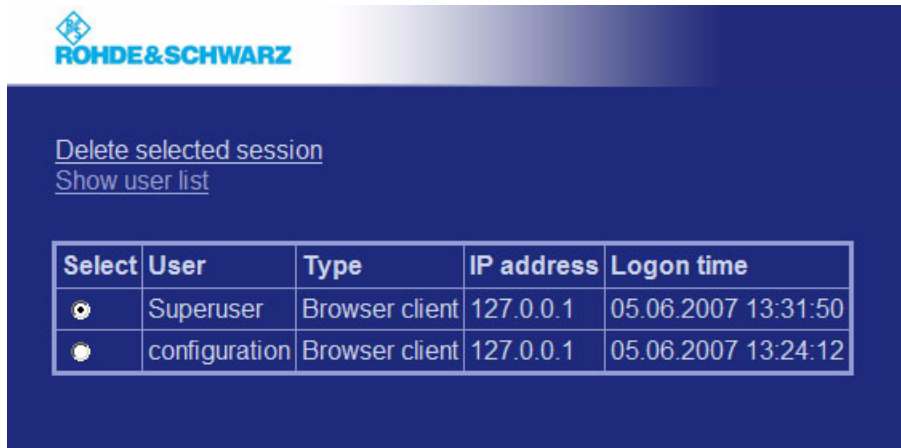
1. Mark the required user.
2. Select **Delete selected user**.

The user is deleted.

**1.3.2 Closing Active Sessions**

If you are logged on as Superuser, you can view detailed information on logged-on users and close active sessions.

1. After logging on, select **Show session list**.



2. Mark the session (the user) that you want to close.
3. Select **Delete selected session**.  
The marked session is closed.
4. Return to the previous browser window by clicking **Show user list**.

## 1.4 Monitoring and Control via SNMP

SNMP (Simple Network Management Protocol) is used for monitoring and controlling a wide variety of different units in a network. Detailed information about this topic can be found under <http://www.wikipedia.org/>.

A description of the unit - the MIB (Management Information Base) - must be loaded in the central unit ("manager") from which the transmitters are monitored.

A monitored unit contains a program ("agent") which can answer queries from the manager and execute commands. Furthermore, the agent may of its own accord generate a message and send it to the manager. In this way, the central unit can be informed of a fault.

### 1.4.1 Installation

The MIBs required for monitoring and controlling a transmitter are stored as a ZIP archive directly in the transmitter control unit and can be downloaded from there using any network-compatible unit. All of the information required for configuration is contained in the MIBs themselves.

When the transmitter is put into operation, both the agent in the transmitter and the manager must be configured. Additional steps may be necessary if the transmitter is connected via routers, firewalls or similar devices as they may block data packets.

- The XX8000 transmitter family supports the versions SNMPv1 and SNMPv2c.
- Alarms can be sent as v1Traps, v2Traps or v2Informs.

- Several destinations can be set for fault messages (alarm sinks).
- Several communities can be set with Read Only authorization and Read/Write authorization.

### 1.4.1.1 Settings on Transmitter Side

You can make settings yourself via the local display (if available), the web server or SNMP. The menu windows of the **SNMP** menu contain all the settings that are required for accessing a transmitter.

**Note** *Changes to these settings are adopted immediately. The device does not need to be restarted.*

NetCCU ..etup > Services > SNMP > General

Port SET/GET	↕ 161
Inhibit Status	↕ Off
Max. not transmitted	↕ 255

NetCCU ..tup > Services > SNMP > Manager

Access Level	Community	Enable
↔ Read Only	↔ public	↔ On
↔ Read / Write	↔ broadcast	↔ On
↔ Read / Write	↔ public1	↔ Off
↔ Read Only	↔ public2	↔ Off
↔ Read / Write	↔ public3	↔ Off

NetCCU ..p > Services > SNMP > Alarmsinks

Alarmsink	↕ 1
Enable	↕ On
IP Address	↕ 10.123.10.139
Port	↕ 162
Alarm Version	↕ v2c Trap
Community	↕ public
Inform Retry	↕ 5
Inform Timeout	↕ 1

**Note** Detailed information about the individual parameters can be found in the descriptions of the respective menu windows.

### 1.4.1.2 Settings on Manager Side

To be able to monitor and control a transmitter with SNMP, the MIB of the device and a program which can interpret the MIB must be available on the manager side.

You can load all available MIBs from any device using a web browser.

1. Log on using the web browser and select the **SNMP Administration** menu.

MIBs from Rohde&Schwarz and IRT are available. MIBs from IRT allow transmitters to be linked using SNMP irrespective of the manufacturer. They are, however, limited with respect to their functionality. When using IRT MIBs, you can select the "Inhibit Status" for local operation (in the same way as for the parallel contacts). If this function is activated, no alarms/traps are sent when the transmitter is in local mode. You can activate/deactivate this function using **Inhibit Status** in the **SNMP > General** menu window.

The MIBs have the naming convention RS-XX8000-<TV/Radio Standard>-<Standby Concept/Option>-MIB. An example is RS-XX8000-ATV-TX-MIB for signal transmitters for analog TV.

#### Examples of MIBs and contents:

<b>MIB</b>	<b>Description</b>
RS-COMMON-MIB	Contains general Rohde&Schwarz definitions
RS-XX8000-COMMON-MIB	Contains definitions which all XX8000 transmitters fulfill (e.g. type plate, configuration)
RS-XX8000-DVB-TX-MIB	Contains definitions for DVB single transmitters, passive exciter standby, active and passive output-stage standby
RS-XX8000-DVB-NP1-MIB	Contains definitions for DVB n+1 systems
RS-XX8000-DVB-NTX-MIB	Contains definitions that an R&S NetCCU800 provides as access for n different, independent DVB transmitters
RS-XX8000-DVB-TX-REC-MIB	Contains definitions for the optional DVB receiver in a transmitter
RS-XX8000-DVB-NP1-REC-MIB	Contains definitions for the optional DVB receiver(s) in an n+1 system
RS-XX8000-FM-TX-MIB	Contains definitions for FM single transmitters with passive exciter standby and active and passive output-stage standby
RS-XX8000-FM-NP1-MIB	Contains definitions for FM n+1 systems
RS-XX8000-ATV-TX-MIB	Contains definitions for analog TV single transmitters with passive exciter standby and active and passive output-stage standby

MIB	Description
RS-XX8000-ATV-NP1-MIB	Contains definitions for analog TV n+1 systems

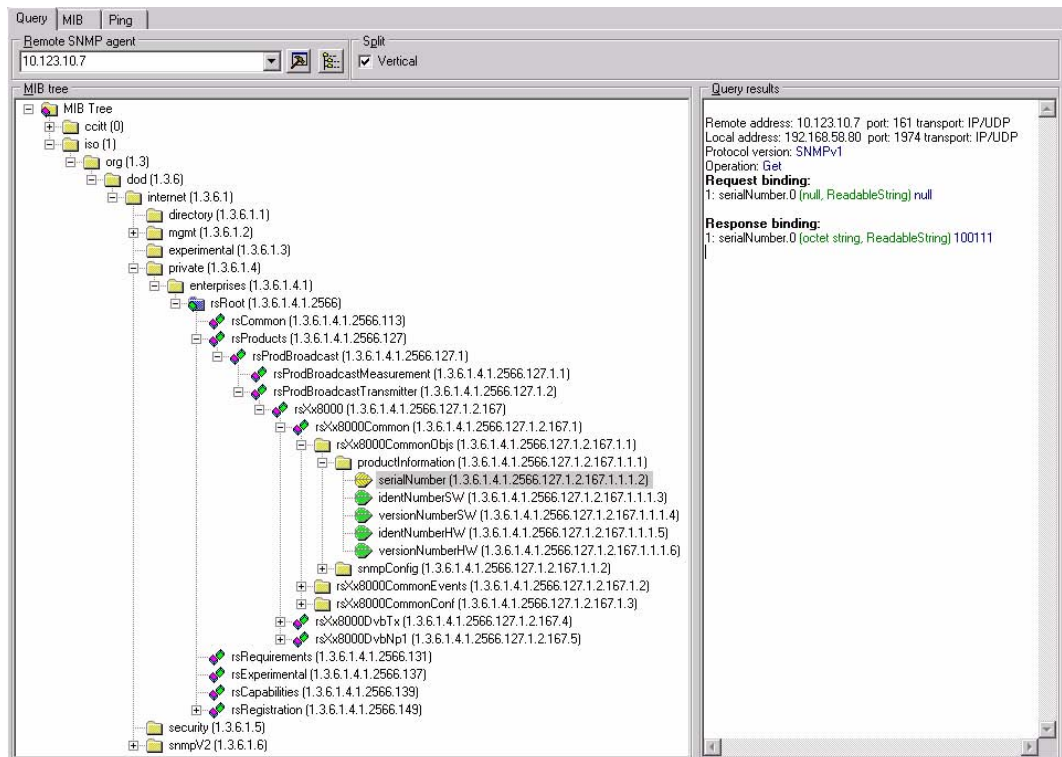
2. Save the required ZIP file to your PC.
3. Load the following MIBs:
  - a) RS-COMMON-MIB
  - b) RS-XX8000-COMMON-MIB
  - c) MIB of the standby concept or option

A detailed description of the MIBs, the information that they contain and the associated options is given below.

### 1.4.1.3 Testing SNMP Communication

SNMP communications is properly set up if you have loaded the MIBs in your program and you are using the correct IP address of the transmitter and the correct community. For queries and settings you must set the SNMP version in your manager; the transmitters detect the used protocol automatically.

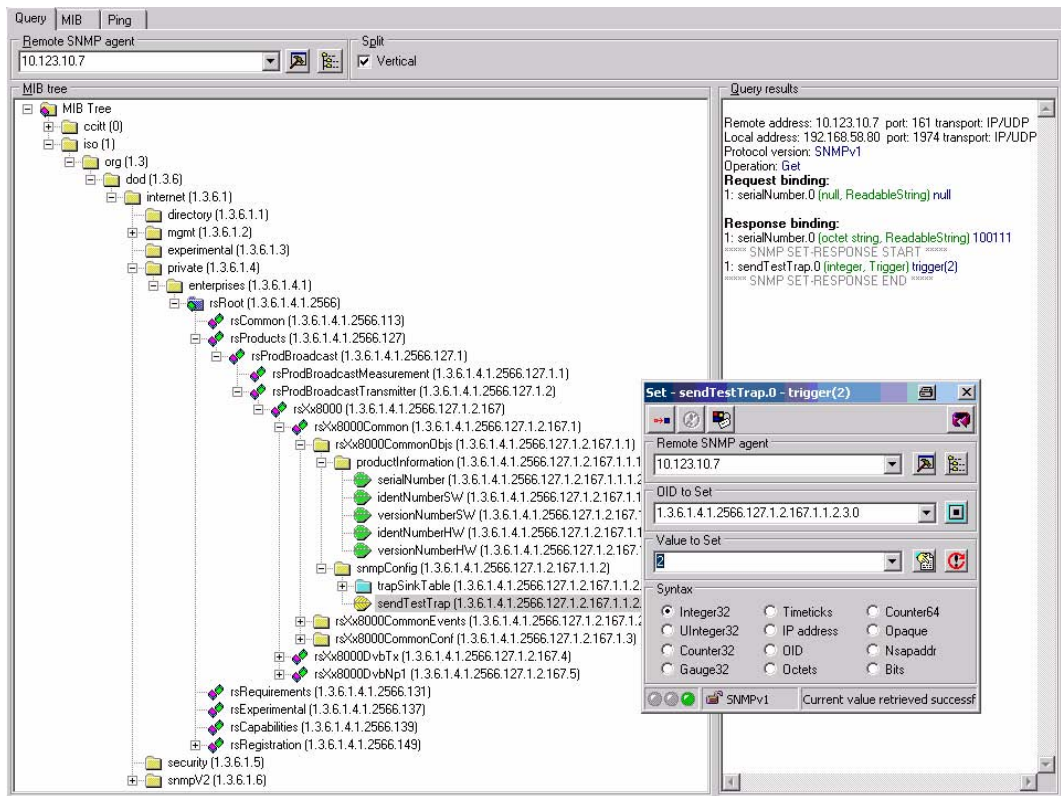
The following query can be used as a simple test:



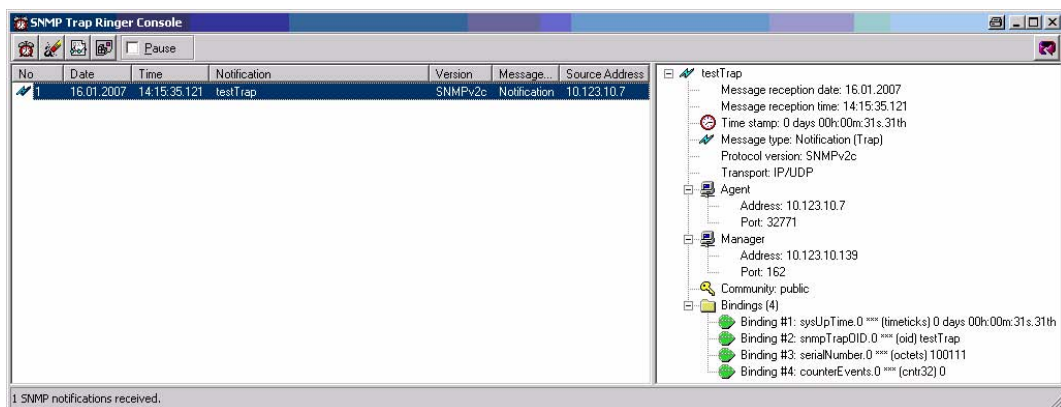
In the example above, a transmitter with the IP address 10.123.10.7 queries the OID (ObjectIdentifier: unique designation of a data point) **serialNumber** (.1.3.6.1.4.1.2566.127.1.2.167.1.1.2). The reply from the agent is **100111**.

Using a further test, you can check whether the transmitter sends an alarm message in the event of an error and whether this message reaches the alarm destinations. To do so, set an OID **sendTestTrap** (.1.3.6.1.4.1.2566.127.1.2.167.1.1.2.3) to the value **2**, which triggers a **testTrap** (.1.3.6.1.4.1.2566.127.1.2.167.1.2.0.1). This alarm is sent to all receivers which have been entered for the alarms (Trapsinks, see above).

This type of fault message functions in a slightly different way than that used for querying and setting values (default: UDP Port 161 for SET/GET and UDP Port 162 for alarms).



The following illustration shows that the **testTrap** has been received correctly by the unit with the serial number **100111**.



**Known problems**

If querying the data does not work or if you do not receive an alarm, check the following:



- Has the network been connected correctly? Does the SNMP connection function exclusively via the remote Ethernet interface of the device (R&S NetCCU800: **X5 – NETLINK**, R&S Sx800/SX801: **X2**, R&S xLx8000: **X32 – ETHERNET REMOTE**)?
- Are the network settings (IP address, gateway) correct?
- Has the correct Community been entered for accessing the manager and the transmitter (case-sensitive)?
- Is a PC firewall blocking incoming SNMP packets?
- Has the program which receives alarms been started and correctly configured?
- In large networks: Is a router or firewall blocking the SNMP packets?
- Is message suppression (**Inhibit Status** in the **SNMP > General** menu) activated?

#### 1.4.1.4 Configuration

This chapter provides an overview of the available properties.

##### **RS-XX8000-COMMON-MIB**

This MIB contains general data that supports every unit:

- Type plate: serial number, software version, etc
- SNMP configuration: table for alarm destinations and alarm versions
- Triggering of a test trap
- Counter for counting the transmitted traps
- List of the alarm messages last transmitted
- Parameters which are used in several other MIBs

This information always applies to the instrument that is being monitored via SNMP.

##### **RS-XX8000-DVB-TX-MIB**

This MIB contains the parameters for:

- the standby concepts "single transmitter", "passive exciter standby", "active output-stage standby" and "passive output-stage standby"
- all power classes (low-power, medium-power and high-power)
- air-cooled and liquid-cooled transmitters

Different parameters are available depending on the system being queried. For example, **cmdTxOpModeExcAutomatic** (.1.3.6.1.4.1.2566.127.1.2.167.4.1.1.1.7) gives the reply **NoSuchName** if you query a single transmitter since this transmitter does not have an automatic exciter function. It is easy to find out which parameters are valid by checking the "module compliances" (e.g. under .1.3.6.1.4.1.2566.127.1.2.167.4.5.2).

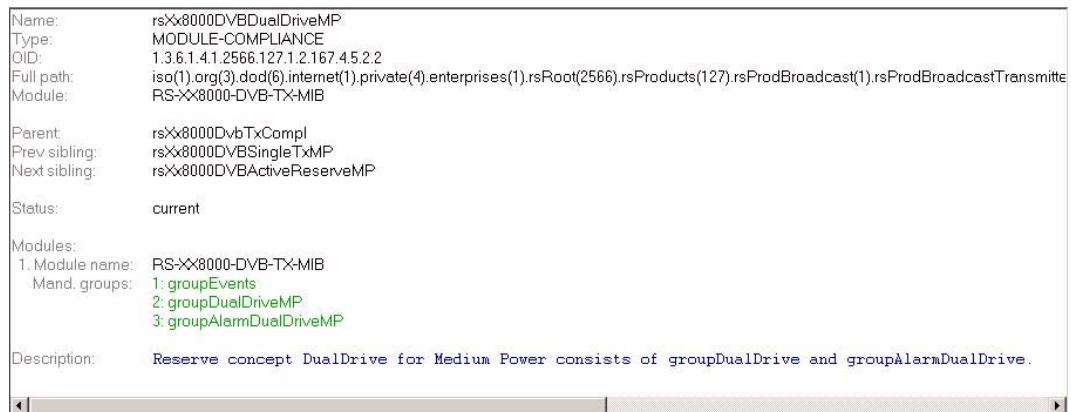
**Example:** DVB configuration, passive exciter standby, medium power, optional DVB receiver module with two inputs.

Valid MIBs:



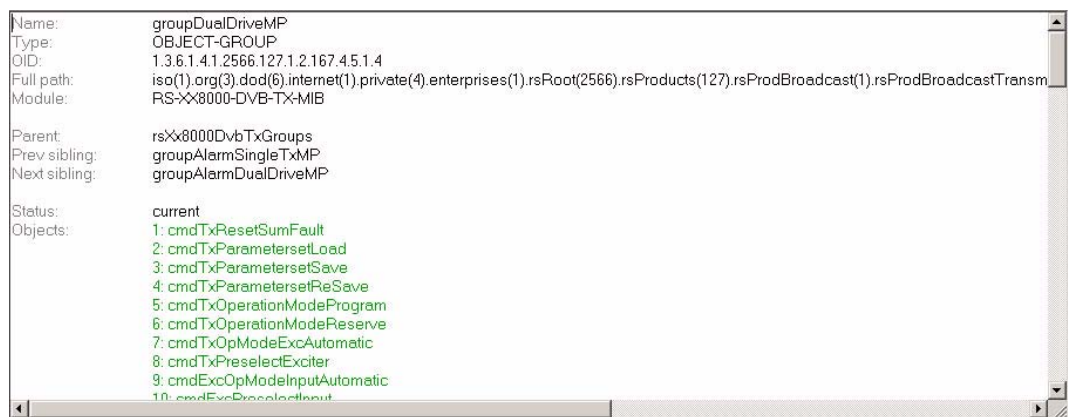
- RS-COMMON-MIB
- RS-XX8000-COMMON-MIB
- RS-XX8000-DVB-TX-MIB
- RS-XX8000-DVB-TX-REC-MIB

The valid OIDs for the transmitter are contained in the "Module Compliance" path. The OID contains references to the individual groups.



**Fig. 5** RS-XX8000-DVB-TX-MIB

- 1) Name and OID for DualDrive MediumPower
- 2) Reference to groupEvents - 1.3.6.1.4.1.2566.127.1.2.167.4.5.1.1
- 3) Reference to groupDualDriveMP - 1.3.6.1.4.1.2566.127.1.2.167.4.5.1.4
- 4) Reference to groupAlarmDualDriveMP - 1.3.6.1.4.1.2566.127.1.2.167.4.5.1.5



**Fig. 6** List of parameters (excerpt) for groupDualDriveMP

- 1) Name and OID for DualTuner
- 2) Reference to groupDualTuner - 1.3.6.1.4.1.2566.127.1.2.167.2.5.1.3
- 3) groupAlarmDualTuner - 1.3.6.1.4.1.2566.127.1.2.167.2.5.1.5

The groups contain all valid OIDs. The valid OIDs for the receiver module are contained in the "Module Compliance" path of the RS-XX8000-DVB-TX-REC-MIB. The OID contains references to the individual groups. The groups contain all valid OIDs.

**RS-XX8000-DVB-NP1-MIB**

This MIB contains all the parameters required for any DVB n+1 system, irrespective of the following features of the individual transmitter:

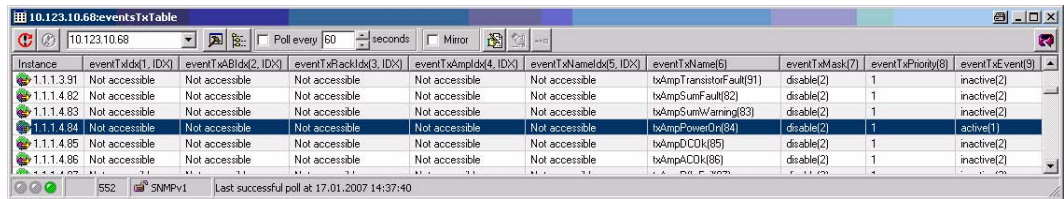
- variant
- power class
- cooling system

Once again, unavailable parameters receive the reply **NoSuchName**, e.g. parameters from the transmitter A8 if only a 4+1 system is available (see module compliances under .1.3.6.1.4.1.2566.127.1.2.167.5.5.2).

**Setting alarms**

The transmitter-specific alarms offer an extensive range of configuration possibilities.

Depending on the available system, it is possible to set detailed alarms: for example, for every item of status information in every amplifier in every rack of every transmitter in a medium-power n+1 system. In addition, it is also possible to assign a freely selectable priority and to check the current status.



In the illustration above, the following information is contained in the highlighted row (depending on the used MIB; here: DVB n+1 medium-power system):

Position of code number	Meaning of position	Value	Meaning of value
1	Transmitter	1	Transmitter TxB
2	Output stage	1	Output stage A
3	Transmitter rack	1	Transmitter rack No. 1
4	Amplifier	4	Amplifier No. 4
5	Event	84	Amplifier ON/OFF

**Tab. 1** "Instance" column (1.1.1.4.84) in numeric order

Column	Meaning	Value	Explanation
eventTxName(6)	Designation of event	txAmpPowerOn(84)	Amplifier ON/OFF
eventTxMask(7)	Message for event	disable(2)	No alarm is sent

Column	Meaning	Value	Explanation
eventTxPriority(8)	Priority for event	Value freely selectable by customer	Default setting when supplied: 1
eventTxEvent(9)	Current status of amplifier	active(1) (inactive(2))	Amplifier ON (Amplifier OFF)

**Tab. 2** *Meaning of other columns*

The columns containing the value **Not accessible** are "index" columns (identified by **IDX**). OIDs of these columns cannot be queried; they are used for internal purposes only.

**Example:** DVB, N+1, low power

Valid MIBs:

- RS-COMMON-MIB
- RS-XX8000-COMMON-MIB
- RS-XX8000-DVB-NP1-MIB

Valid OIDs in "Module Compliance" path for N+1 low power:

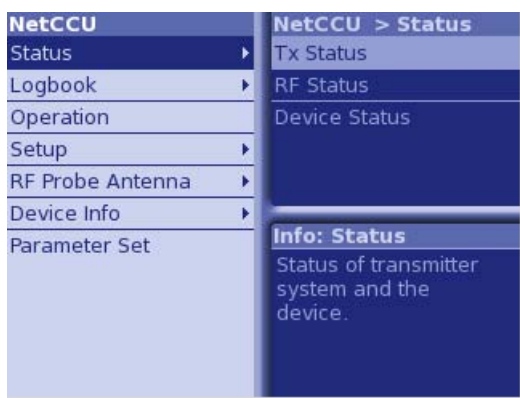
- Name: rsXx8000DVBNplus1LP
- OID: 1.3.6.1.4.1.2566.127.1.2.167.5.5.2.2

Groups:

- groupNsuLP - 1.36.1.4.1.2566.127.1.2.167.5.5.1.6
- groupAlarmNsuLP" - 1.3.6.1.4.1.2566.127.1.2.167.5.5.1.7
- groupTxLP - 1.3.6.1.4.1.2566.127.1.2.167.5.5.1.8
- groupAlarmTxLP - 1.3.6.1.4.1.2566.127.1.2.167.5.5.1.9
- groupEvents - 1.3.6.1.4.1.2566.127.1.2.167.5.5.1.5

## 2 Menus of R&S NetCCU800

### 2.1 Overview of Menus



R&S NetCCU800 menu structure				
Level 1	Level 2	Level 3	Level 4	Level 5
Status				
	Tx Status			
	RF Status			
	Device Status			
Logbook				
	Summary			
	Status			
	Warning			
	Fault			
Operation				
Setup				
	TX Setup			
	Option Keys			
		Status		
		Install		
		Deactivation		

R&S NetCCU800 menu structure				
Level 1	Level 2	Level 3	Level 4	Level 5
	NetCCU Setup			
		Common		
		Date / Time		
		System		
		SW Maintenance		
		SW Backup/ Restore		
		Network		
			Front Ethernet	
			Rear Ethernet	
		Services		
			SNMP	
				General
				Manager
				Alarmsinks
			NTP	
			RS232	
	ParIO Cards Order			
	General Purpose ParIO			
RF Probe Antenna				
	RF Vision <sup>a)</sup>			
	RF Sound <sup>a)</sup>			
	RF Probe Forward			
	RF Probe Reflected			
Device Info				

R&S NetCCU800 menu structure				
Level 1	Level 2	Level 3	Level 4	Level 5
	NetCCU			
	Mainboard			
Parameter Set				

a) Analog TV only

## 2.2 Login

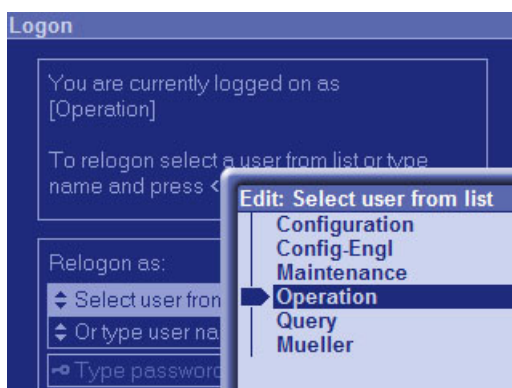
Various authorization levels protect against nondeliberate access of critical system settings from the home menu. When you start local operation via the keypad and display of the R&S NetCCU800, your user ID is **Operation** by default.

*Note* If you have the appropriate authorization, you can change, create or delete user profiles using the user administration facility (called up via the web browser).

You can change your user ID in any menu using the **Change User** context menu. No password is required to change the user ID under local control (according to the factory default). You can also protect access via the front panel by entering a password.



You can select a user profile by clicking **Select user from list**.



The following factory-default user profiles are available for local operation:

User ID	Authorization	Password <sup>a)</sup>
Configuration	Allows you to set basic transmitter parameters; e.g. setup	1234
Maintenance	Allows you to perform maintenance tasks; e.g. software update	1234
Operation	Allows you to make settings that directly affect transmitter operation	1234
Query	Read-only authorization	1234
Config-Engl	Same as Configuration authorization; this ID also changes the menu language to English (irrespective of the preset language, e.g. Chinese)	1234

a) By default the password (factory setting: 1234) is needed only for browser-based operation. Every user can change his/her own password via the user administration program.

**Change of user via the front panel by entering a password (example)**

In the following example a user profile "Schmidt" has been set up in user administration. The user has obtained authorization for local control, but must enter a password.

1. From the context menu, call the **Change User** command.
2. Go to **Select user from list** and select the user **Schmidt <pw>**.  
The "<pw>" in angle brackets tells you that a password is needed.



3. Select the **Type password** command.



4. Enter the password in the editor.
5. Use the **Logon** command from the context menu to log on.



User "Schmidt" is then logged on:



## 2.3 Status Menu

The **Status** menu provides an overview of faults, warnings and status messages relating to the individual components and functions of the transmitter.

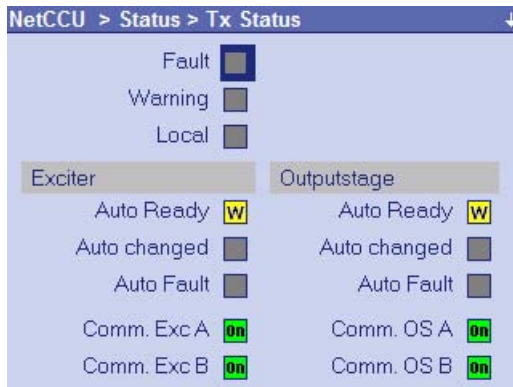


### 2.3.1 Tx Status Menu Window

The **TX Status** menu window provides an overview of faults, warnings and status messages relating to the communication and standby status of the transmitter.

The **TX Status** menu window is divided into the following three sections (from top left to bottom right):

- Sum fault / sum warning / local mode
- Status messages relating to automatic exciter switchover function
- Status messages relating to automatic amplifier-stage switchover function

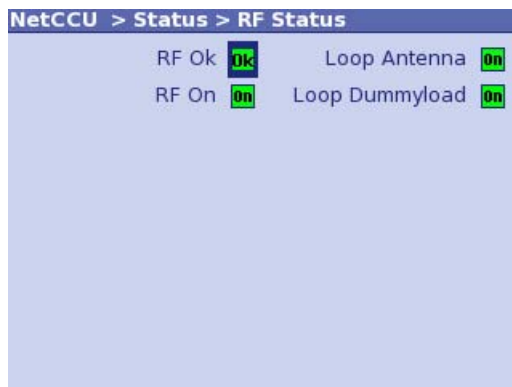


Function	Explanation
Fault	Red: Sum message "Fault"; a fault has occurred in the transmitter system
Warning	Yellow: Sum message "Warning"; a warning message has been output in the transmitter system
Local	Yellow: R&S NetCCU800 has been switched over to local mode
<b>Exciter</b>	
Auto Ready	Green: Automatic exciter switchover function is ready Yellow: Automatic exciter switchover function is not ready
Auto Chan.	Yellow: Switchover to standby exciter; Auto Ready indicator is yellow
Auto Fault	Red: A fault occurred during switchover to the standby exciter
Comm Ex. A	Red: Communication error between R&S NetCCU800 and exciter A
Comm. Ex. B	Red: Communication error between R&S NetCCU800 and exciter B
<b>Outputstage</b>	
Auto Ready	Green: Automatic output-stage switchover function is ready Yellow: Automatic output-stage switchover function is not ready

Function	Explanation
Auto Chan.	Yellow: Switchover to standby output stage; Auto Ready indicator is yellow
Auto Fault	Red: A fault occurred during switchover to the standby output stage
Comm. OS. A	Red: Communication error between R&S NetCCU800 and output stage A
Comm OS. B	Red: Communication error between R&S NetCCU800 and output stage B

### 2.3.2 RF Status Menu Window

The **RF Status** menu window provides an overview of the transmitter's RF status.



Function	Explanation
RF On	Green: Antenna output power above the set fault threshold
RF OK	Green: Antenna output power above the set warning threshold
Reduced RF (ATV only)	Yellow: Transmitter has reduced its output power
Loop Program	Green: Closed operation loop Yellow: Open operation loop
Loop Dummyload	Green: Closed operation loop Yellow: Open operation loop

### 2.3.3 Device Status Menu Window

The **Device Status** menu window provides an overview of faults, warnings and status messages relating to the R&S NetCCU800.



Function	Description
Power Supply	Red: Internal power supply of the R&S NetCCU800 has failed; otherwise green  Right: Displays the check value of the internal voltage supply; the correct value is in the range 1.86 to 2.28 V
Device Temp.	Red: Temperature inside the R&S NetCCU800 is too high; otherwise green  Right: Displays the current temperature
Fan	Yellow: Fan of the R&S NetCCU800 has failed; otherwise green

## 2.4 Logbook Menu

You can use the **Logbook** menu to query status and error messages relating to the R&S NetCCU800, to delete these messages and to restore deleted messages. The menu windows of the logbook provide an overview of the status, warning and error messages relating to the R&S NetCCU800.

**Note** You can call up logbook entries in the windows **Summary**, **Status**, **Warning** and **Fault**. The structure of the four windows is identical.

## 2.4.1 Summary Menu Window

NetCCU Logbook Summary			
No.	Message	Date	Time
239	↑ Exc A Warning	09-03-19	07:39:55
238	↑ Active Ost A	09-03-19	07:39:55
237	↑ Active Exc A	09-03-19	07:39:55
236	↑ Reboot	09-03-19	07:39:51
235	↑ Local	09-03-19	07:39:51
234	↑ Local	09-03-19	07:39:29
233	↓ Local	09-03-19	07:39:28
232	↓ No connect Exc A	09-03-19	07:39:13
231	↑ Exc A Warning	09-03-19	07:39:13

**Fig. 7** Logbook > Summary window

The following table explains the meaning of the columns:

Column	Explanation
No	Consecutive entry number
Message	Message
Time	Time at which the message was received
Date	Date on which the message was received

The arrows in the second column have the following meaning:

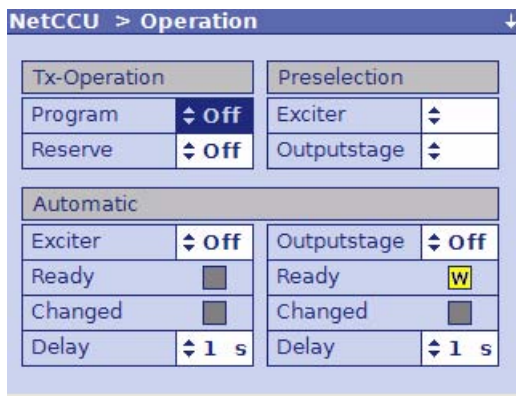
Arrow direction	Arrow color	Explanation
Up		The event has just occurred.
Down		The event is no longer current or relevant.
	Red	Fault
	Yellow	Warning
	Green	Status

Using the context menu, you can delete (**Clear logbook**) and restore (**Restore logbook**) status and error messages.

Function	Explanation
Clear logbook	Clears all entries in the current logbook; clearing individual logbook entries is not possible.  <i>When you clear the complete logbook, the partial logbooks are also cleared. A Reset Fault is triggered at the same time.</i>
Restore logbook	Restores the cleared entries in the current logbook.  <i>When you restore the complete logbook, the partial logbooks are also restored.</i>

## 2.5 Operation Menu Window

In the **Operation** menu window you can make settings for the standby behavior and for the exciter and amplifier.



Function	Explanation
<b>Tx-Operation</b>	
Program On/Off	ON/OFF command for transmitter (exciter and output stage); corresponds to the hard key on the front panel
Reserve On/Off	ON/OFF command for standby transmitter (all components that are not connected to an antenna)
<b>Preselection</b>	
Exciter A/B	Used to select the active exciter
Outputstage A/B	Used to select the active output stage
<b>Automatic</b>	

Function	Explanation
Exciter On/Off	Used to switch the automatic exciter switchover function to active or not active
Ready	Status of the automatic exciter switchover function:  Green: Automatic switchover function is ready for operation Yellow: Automatic switchover function is ready for operation
Changed	Yellow: Main exciter has been switched over to the standby exciter; Ready indicator is yellow
Delay	Delay before a switchover occurs so that a brief fault does not immediately trigger a switchover.
Outputstage On/Off (only with passive output-stage standby = passive PA)	Used to switch the automatic amplifier switchover function to active or not active
Ready	Status of the automatic amplifier switchover function:  Green: Automatic switchover function is ready for operation Yellow: Automatic switchover function is not ready for operation
Changed	Yellow: Main amplifier has been switched over to the standby amplifier; Ready indicator is yellow
Delay	Delay before a switchover occurs so that a brief fault does not immediately trigger a switchover.
Automatic ready after changeover (with standby systems only)	If this function is activated, the automatic function can assume the "Ready" state again following switchover. Switchover is then possible again.
Reset on program off	If this function is activated, the OFF command also executes a reset fault (see below).
Reset Fault (context menu)	Used to reset fault indicators  The function has the same effect as the <b>RESET FAULT</b> key on the front panel of the exciter and also belongs to the range of functions available for remote operation via the R&S NetCCU800.

## 2.6 Setup Menu

You can use the **Setup** menu to configure the transmitter system's hardware.

### 2.6.1 Tx Setup Menu Window

In the **Tx Setup** menu window you can define the standby behavior and enter additional system-specific settings.



Function	Explanation
Tx Mode	Used to select the transmitter standard <ul style="list-style-type: none"> <li>- NoExciter: R&amp;S NetCCU800 is operated as a standalone instrument (e.g. in combination with the DVB-T receiver module option)</li> <li>- Multi: Both exciters in a transmitter use different standards</li> <li>- FM: Analog sound broadcasting standard</li> <li>- ATV: Analog TV standard</li> <li>- ATSC: Digital TV standard (USA)</li> <li>- DAB: Digital audio broadcasting standard</li> <li>- DVB: Digital TV standard (Europe)</li> <li>- DTMB: Digital TV standard (South America, Asia, Europe)</li> <li>- MediaFLO™: Digital TV standard (USA)</li> <li>- ISDB-T: Digital TV standard (Brazil, Japan)</li> </ul>
ATV Mode	Selection only possible if ATV is set under Tx Mode <ul style="list-style-type: none"> <li>- Comb Single: Vision signal and sound signal are transmitted via one amplifier (same channel) (single = 1 sound carrier)</li> <li>- Comb Dual: Vision signal and sound signal are transmitted via one amplifier (same channel) (dual = 2 sound carriers)</li> </ul>
Power Mode	Used to set the power class <ul style="list-style-type: none"> <li>- Low</li> <li>- Medium</li> <li>- High</li> </ul>
Cooling System	Used cooling system  The following setting is preset for Power Mode "Low" or "Medium": <ul style="list-style-type: none"> <li>- Air: Air cooling</li> </ul> The following settings can be selected for Power Mode "High": <ul style="list-style-type: none"> <li>- Liquid: Transmitter is connected to an external cooling system which is used to cool the entire station</li> <li>- Liquid PUC: Transmitter has its own cooling system (R&amp;S ZK810)</li> </ul>
Tx Type	Used to set the standby behavior: <ul style="list-style-type: none"> <li>- Single TX: Standby system (see below)</li> <li>- Dual Drive: Standby system (see below)</li> <li>- Passive PA: Standby system (see below)</li> <li>- Active PA: Standby system (see below)</li> </ul>

Function	Explanation
Power Switch	Used to set the hardware configuration for antenna switchover. The following options are available: <ul style="list-style-type: none"> <li>– "Manual" for manual antenna switchover</li> <li>– "Automatic" for electronic antenna switchover</li> </ul>
Antenna Type	Country-specific setting for the antenna type; the default setting is Full

### Basic setup of transmitter standby systems

Transmitter standby system	Setting: Tx Type	Setting: Power Switch
Single transmitter system (without standby)	Single Tx	Manual
2 exciters / 1 output stage; if one exciter fails, switchover to second exciter	Dual Drive	Manual
2 exciters / 2 output stages; if one exciter or output stage fails, switchover to other exciter or output stage	Passive PA	Automatic
2 exciters / 2 output stages; if one output stage fails, transmission at half power (failure of an exciter has no negative consequences)	Active PA	Manual / Automatic

## 2.6.2 Option Keys Menu

Certain features of the device are activated using the Option Keys mechanism.

Each available software option can be enabled by installing a valid *activation key*. If a software option is later no longer required, activation can be canceled again by installing a *deactivation key*.

**Note** *The deactivation mechanism allows software options which are no longer required to be "returned" to Rohde & Schwarz.*

Option keys are available from your local Rohde & Schwarz sales partners.

### Installing option keys

Option keys can be installed in three ways:



- Automatic installation of one or more activation keys using the Software Distributor  
The procedure is the same as for performing software updates (see the chapter "Maintenance").
- Installation of an option key by means of a web browser  
With this method, the option key can be transferred from, for example, a received mail using the copy/paste function.
- Installation of an option key directly at the display  
With this method, a 30-digit code is entered using the keyboard.

The two last methods use the installation menu **Setup > Option Keys > Install** described below.

### 2.6.2.1 Status Menu Window

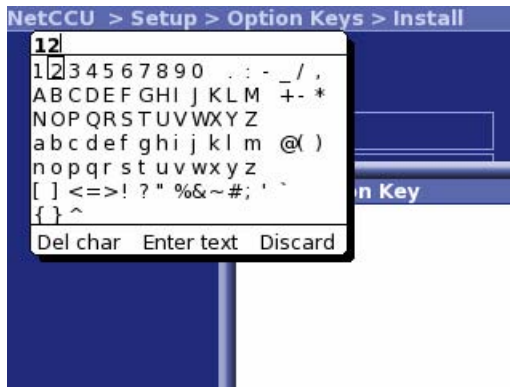
The **Setup > Option Keys > Status** menu window lists the available software options with their respective activation status.

NetCCU > Setup > Option Keys > Status			
K	Name		Validity
K02	SNMP	OK	Permanent
K03	n+1	OK	Permanent
K20	Dual Receiver	OK	Permanent
K21	nTx	<input type="checkbox"/>	
K00	Demo	<input type="checkbox"/>	

List column	Explanation
K	The K material number and stock number of the device are used to order an option key to activate a software option from Rohde & Schwarz sales partners.
Name	Name of the software option
—	Status of a software option: - Green (OK): Option has been activated - Gray: Option has not been activated
Validity	Validity period of an installed option key: - Permanent: Option activated for an unlimited period (standard license) - "Expiry date": Option remains activated until the displayed expiry date (e.g. as a test license)  <i>If the activation mechanism is not supported by the hardware, all software options are activated automatically (status = OK). In this case, no validity period is displayed in the Validity column.</i>

### 2.6.2.2 Install Menu Window

The **Setup > Option Keys > Install** menu window is used to install option keys manually.



Setting item	Description
Option Key	Used to enter a 30-digit code to activate (or deactivate) a software option. Entry of the code is completed with <b>Enter</b> or <b>OK</b> .

Display	Description
Status	<ul style="list-style-type: none"> <li>- Status = OK: The mechanism used to activate/deactivate software options is supported by the hardware. To be able to use a software option, the associated option key must be installed.</li> <li>- No key Required: The mechanism used to activate/deactivate software options is not supported by the hardware. All available software options can be used without installing option keys.</li> </ul>
Message	Dialog box with the following messages: <ul style="list-style-type: none"> <li>- Please enter a key: Prompt to enter a key</li> <li>- Key OK: Key entered successfully (the display changes back to "Please enter a key" after a few moments)</li> <li>- Key deactivated: Deactivation key entered successfully (the display changes back to "Please enter a key" after a few moments)</li> <li>- Invalid format: Invalid key entered</li> </ul>

### 2.6.2.3 Deactivations Menu Window

The **Setup > Option Keys > Deactivations** menu window lists software options which were once active, but have been deactivated again using a deactivation key.

NetCCU ..tup > Option Keys > Deactivations		
K	Name	Response

Column	Explanation
K	The K material number and stock number of the device are used for ordering an option key to activate a software option from Rohde & Schwarz sales partners.
Name	Name of the software option
Response	Acknowledgment code as a system response to a deactivation  To prove that a software option has been deactivated, the acknowledgment code must be sent to the Rohde & Schwarz sales partner (e.g. by e-mail).

### 2.6.3 NetCCU Setup Menu

You can make basic system settings in the **NetCCU Setup** menu.

#### 2.6.3.1 Common Menu Window

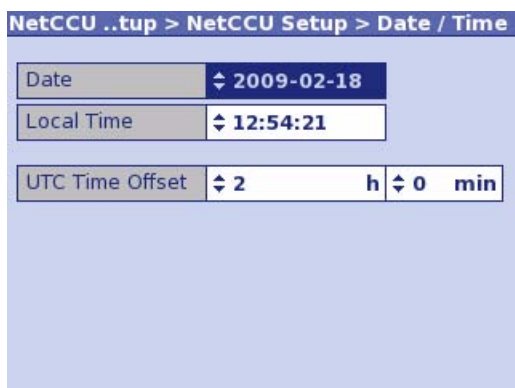
In the **Common** menu window, general settings for the system can be made.

NetCCU .. Setup > NetCCU Setup > Common		
Display Timeout	⇅ 5	min
LED Local	⇅	Yellow
LED On	⇅	Yellow
Fan Control	⇅	On
Tx Name	⇅	Nx8000

Function	Explanation
Display Timeout	Time in minutes after which the display switches off (standby)
LED Local	Color of the Local LED on the front panel of the R&S NetCCU800 (yellow, green)
LED On	Color of the ON LED on the front panel of the R&S NetCCU800 (yellow, green)
Fan Control	Used to switch the fan monitoring function on and off; the fan monitoring function must be switched off for instruments without fans.
Tx Name	User-definable name for the transmitter; is displayed in the login screen and in the browser window

### 2.6.3.2 Date/Time Menu Window

The date and precise time are required to make correct logbook entries. This information is supplied by the internal clock of the R&S NetCCU800. If necessary, the time and date can be corrected in the **Date/Time** menu window.



Setting item	Explanation
Date	Used to set the current date
Local Time	Used to set the local time  The local time is the time of day or zone time applicable at the station.  <i>Unlike universal time (UTC = universal time coordinated), there is a positive offset for time zones east of Greenwich or a negative offset for time zones west of Greenwich. This offset is determined by the time zone and is always a multiple of a full hour or sometimes of a half hour.</i>  <i>In some countries, the clock is set forward by 1 hour in summer (daylight saving time). The time offset relative to UTC then changes correspondingly.</i>
UTC Time Offset	Used to enter the time offset between local time and UTC

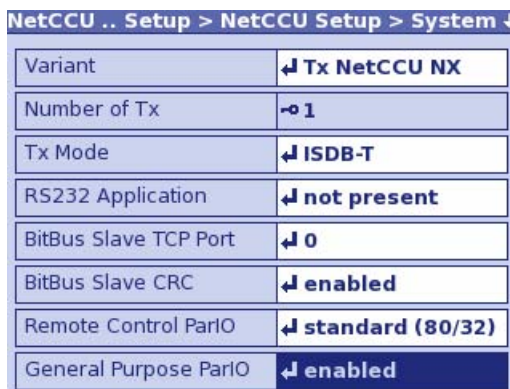
### Using NTP

You can change directly to the **NTP** menu window from the context menu. With NTP, the local time is determined via NTP and a time set manually under **Local Time** is overwritten.

Function	Explanation
Setup NTP	Used to change directly to the <b>NTP</b> menu window

### 2.6.3.3 System Menu Window

You can use the **System** menu window to make settings which determine how the R&S NetCCU800 is used. Depending on the selected setting, a different entry screen and different menus are displayed after the R&S NetCCU800 is booted.



NetCCU .. Setup > NetCCU Setup > System ↓	
Variant	↕ Tx NetCCU NX
Number of Tx	→ 1
Tx Mode	↕ ISDB-T
RS232 Application	↕ not present
BitBus Slave TCP Port	↕ 0
BitBus Slave CRC	↕ enabled
Remote Control ParIO	↕ standard (80/32)
General Purpose ParIO	↕ enabled

Function	Explanation
Variant	Use of the R&S NetCCU800 as <ul style="list-style-type: none"> <li>– NetCCU for low power (Tx NetCCU SV)</li> <li>– NetCCU for medium/high power (Tx NetCCU NX)</li> <li>– NSU for a 1+1 system without transmitter connection panels (1+1 w/o TCB)</li> <li>– NSU for an N+1 system (n+1 NetCCU)</li> <li>– NCU for several low-power transmitters (nTx NetCCU)</li> </ul>
Number of Tx	Number of main transmitters in the transmitter system (only relevant if the R&S NetCCU800 is used as an NSU/NCU)
TX Mode	Used to select the TV/sound broadcasting standard

Function	Explanation
RS232 Application	Used to determine whether the internal RS-232-C interface is used (if a DVB-T receiver module is installed, the external interface is deactivated by means of jumpers) <ul style="list-style-type: none"> <li>- Not present: RS232 interface is deactivated</li> <li>- DVB RCV / tcm: RS232 interface is used for DVB receivers (from other manufacturers)</li> <li>- DVB RCV / rus: RS232 interface is used for DVB receivers (R&amp;S instruments)</li> <li>- BitBus Slave: The R&amp;S NetCCU800 can be controlled via the RS232 interface using the BitBus protocol</li> <li>- BitBus Master: Another BitBus-compatible instrument can be controlled via the RS232 interface</li> </ul>
BitBus Slave TCP Port	Port address for BitBus slave: For remote control via Ethernet using the serial interface
BitBus Slave CRC	Used to activate/deactivate BitBus slave CRC: Activation for remote control via Ethernet using the serial interface
Remote Control ParIO	Used to activate/deactivate the parallel remote interface of the transmitter (connector X9); for selecting a parallel remote interface card with 80/32 (standard) or 12/9 (mini) outputs/inputs
General Purpose ParIO	This option makes it possible to use a ParIO board (R&S material number 5302.3830.02) to connect external devices
Inhibit Status	For local mode, the messages from the transmitter are activated/deactivated; with message suppression activated, all traps with the exception of the local mode trap are suppressed
Ant. Measuring Point	Antenna test point present and in use (only for low power with R&S NetCCU800)

### 2.6.3.4 SW Maintenance Menu Window

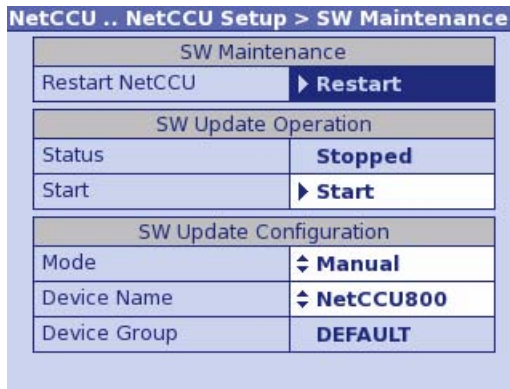
In the **SW Maintenance** menu window you can perform software updates for the R&S NetCCU800 and the connected exciters.

To perform a software update, you must connect the R&S NetCCU800 to a PC which has the required updates and update software.

Before you call the update software on the PC, you must set the R&S NetCCU800 to Update mode using the **Start NetCCU Update** context menu. When you call the update software on the PC, the software automatically analyzes which updates need to be installed. The update procedure is started from the PC by means of the update software.

Updates for the R&S NetCCU800 are installed straight away. In a further step, updates for the exciter(s) must be started from the R&S NetCCU800 via the **Start Exciter A/B Update** context menu.

**Note** *The entire update procedure is described in detail in the chapter "Maintenance" in the R&S NetCCU800 manual.*



Function	Explanation
<b>SW Maintenance</b>	
Restart NetCCU	The R&S NetCCU800 is restarted.
<b>SW Update Operation</b>	
Status	Displays the progress of the software update installation.
Start	Used to start installation of a new software update.
<b>SW Update Configuration</b>	
Mode	<ul style="list-style-type: none"> <li>– Manual: Software update is started manually with Start.</li> <li>– Permanent: Software update is started automatically as soon as an update is available.</li> </ul>
Device Name	User-definable name for the R&S NetCCU800; during the software update, the installation software lists the R&S NetCCU800 under this name.
Device Group	Displays the group in large networks (e.g. department) for which the software update is being performed.

### 2.6.3.5 SW Backup/Restore Menu Window

You can use the **SW Backup/Restore** menu to save the software and all R&S NetCCU800 settings as a backup file and to restore the information from this file in full. All information is backed up to the R&S NetCCU800 flash card.

**Note** *The backup file can also be copied to another storage medium and copied back to the flash card from there.*

Commands	
Backup	→ Start
Restore	→ Start
Status	
Status	Ready
Backup Information	
File Status	Backup OK
Device	NetCCU800
Part Number	2095.8007k02
Serial Number	100116

Display	Description
Backup	For backing up the current state of the software and settings
Restore	For restoring the backup (a restore is only possible if the backup concerned is valid; see the Backup Information part of the window)
Status	<p>Status of the Backup/Restore procedure</p> <ul style="list-style-type: none"> <li>– Ready: The Backup/Restore function is ready</li> <li>– Check in progress: The backup file concerned is being checked. The result will be displayed in the Backup Information part of the window</li> <li>– Restore in progress: A restore procedure is running</li> <li>– Backup in progress: A backup procedure is running</li> <li>– Upload in progress: The backup file is being uploaded to the R&amp;S NetCCU800 from external medium</li> <li>– Download in progress: The backup file is being transferred to external medium</li> </ul>
File Status	<p>Status of the backup file</p> <ul style="list-style-type: none"> <li>– Unknown: The status cannot be determined</li> <li>– Backup OK: The backup is valid</li> <li>– No backup available: There is no backup in the device</li> <li>– Invalid backup: The backup is invalid</li> <li>– Invalid checksum: A checksum error has been detected. The backup is not consistent</li> <li>– Invalid device: The backup is not compatible with the NetCCU800</li> </ul>
Device	R&S name of the device for which software and settings have been backed up
Part Number	R&S part number of the device for which software and settings have been backed up
Serial Number	R&S serial number of the device for which software and settings have been backed up
Date	Date of the backup
Time	Local time of the backup
SW Version	Version of the software contained in the backup
Tx Name	Tx name at the time of the backup



**2.6.3.6 Network Submenu**

In the menu windows of the **Network** menu you can make the settings required when connecting the R&S NetCCU800 to a PC/laptop or LAN/WAN.

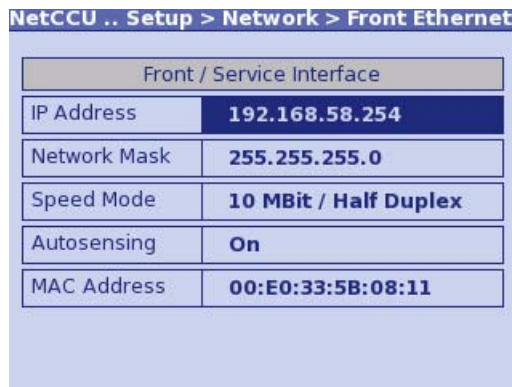
The network settings for the front Ethernet interface are preset. You can configure the settings for the rear interface manually or have them assigned automatically by a DHCP server in the network.

**Menu windows**

The **Network** menu branches to the following menu windows:

- **Front Ethernet** (connection of a PC/laptop using a cross cable): display of the network settings for the front interface **ETHERNET**
- **Rear Ethernet** (connection to a LAN/WAN): display and configuration of the network settings for the rear Ethernet interface **NETLINK (X5)**

**2.6.3.7 Network > Front Ethernet Menu Window**

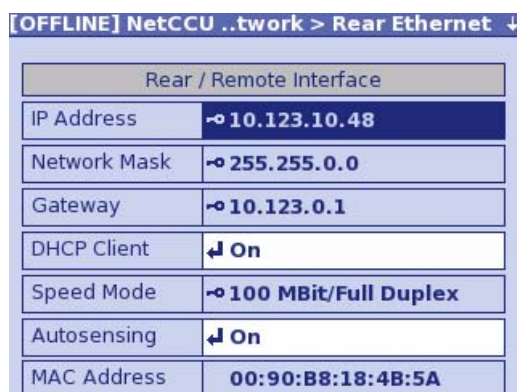


Display	Explanation
IP Address	IP address of the network card
Network Mask	Subnet mask of the network card
Speed Mode	Speed and duplex Factory setting: 10 Mbit / half duplex
Autosensing	Autonegotiation ON/OFF Factory setting: On <i>Autonegotiation = Automatic determination of the settings for the network card</i>
MAC Address	Unique ID of the network card

**Notes**

All settings for the front Ethernet interface are preset. If a PC/laptop is to be connected, the network interface on the PC/laptop must be configured accordingly:

- IP address (PC): First three segments same as those for **IP Address** of the R&S NetCCU800 (see above); a value below 250 must be entered for the last segment
- Subnet mask (PC): Same settings as under **Network Mask** (see above)

**2.6.3.8 Network > Rear Ethernet Menu Window**


Setting/display	Explanation
IP Address	IP address of the network card
Network Mask	Subnet mask of the network card
Gateway	Gateway address (specified by the network administrator)
DHCP Client	Switch used to activate/deactivate the DHCP client: <ul style="list-style-type: none"> <li>- On: The network settings for IP address, subnet mask and gateway are retrieved automatically by a DHCP server</li> <li>- Off: The network settings for IP address, subnet mask and gateway must be entered manually (see above)</li> </ul>
Speed Mode <sup>a)</sup>	Speed and duplex Factory setting: 100 Mbit / full duplex
Autosensing <sup>a)</sup>	Autonegotiation ON/OFF Factory setting: On <i>Autonegotiation = Automatic determination of the settings for the network card</i>
MAC Address	Unique ID of the network card

a) Caution: Only change the settings for Speed Mode and Autosensing in exceptional cases where there are problems with the network connection.

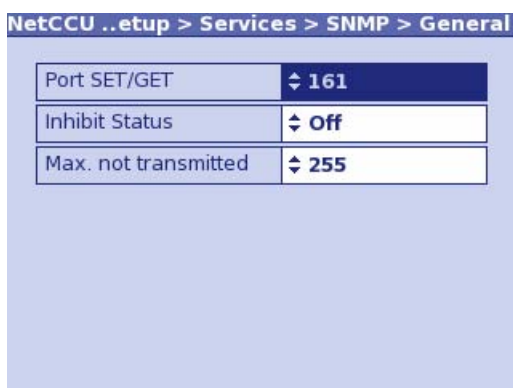
**Notes**

- Manual settings for remote connection should only be entered in offline mode (context menu: **Edit Offline**) and then activated with **Submit Changes** (context menu).
- The IP address must not be in the same network as the front **ETHERNET** interface.
- To allow automatic integration in a network (**DHCP Client** activated), the network must contain a DHCP server.

**2.6.3.9 Services Submenu**

In the menu windows of the **Services** menu, you can make settings for the SNMP, RS232 and NTP communication interfaces.

**2.6.3.10 Services > SNMP > General Menu Window**



Function	Explanation
Port SET/GET	UDP port for SNMP SET/GET Default setting: 161
Inhibit Status	Switch for message suppression in Local mode <ul style="list-style-type: none"> <li>- Off: Traps (alarm messages) are sent in both operating modes (Remote and Local)</li> <li>- On: No traps are sent in Local mode but the alarms are stored; exception: trap for Local Mode</li> </ul> Default setting: Off  If OIDs are polled with message suppression active, the return value is 0 (undefined). In this operating state, SNMP commands (SET) are not executed but simply confirmed.  When the Remote mode is reactivated, all stored alarms are sent once. The polling of OIDs again returns current values.
Max. not transmitted	Number of alarms to be stored if message suppression is active Default setting: 255

**2.6.3.11 Services > SNMP > Manager Menu Window**

NetCCU ..tup > Services > SNMP > Manager

Access Level	Community	Enable
Read Only	public	On
Read / Write	broadcast	On
Read / Write	public1	Off
Read Only	public2	Off
Read / Write	public3	Off

Function	Explanation
Access Level [1 ... 5]	Used to select access authorization for one of five user groups – Read Only: For GET (only read access to the agent) – Read / Write: For SET (read and write access to the agent)
Community [1 ... 5]	Used to set the SNMP community string (a type of password) for a user group  Default setting: "public" for read only (GET) and "broadcast" for read / write (SET)  <i>Case-sensitive!</i>
Enable	Used to activate (On) or deactivate (Off) a community  <i>The Off setting is used for configuration purposes and for testing.</i>

**2.6.3.12 Services > SNMP > Alarmsinks Menu Window**

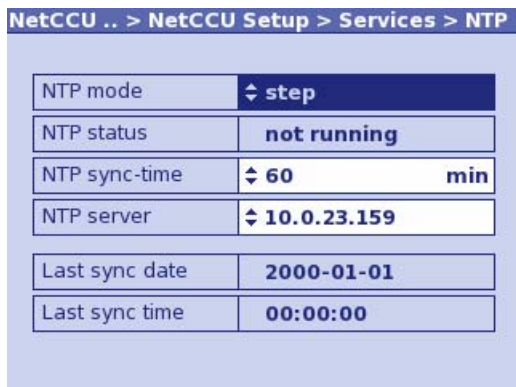
NetCCU ..p > Services > SNMP > Alarmsinks

Alarmsink	1
Enable	On
IP Address	10.123.10.139
Port	162
Alarm Version	v2c Trap
Community	public
Inform Retry	5
Inform Timeout	1

Function	Explanation
Alarmsink	Used to select one of 5 alarm sinks for configuration
Enable	Used to activate (On) or deactivate (Off) a selected alarm sink <i>The Off setting is used for configuration purposes and for testing.</i>
IP Address	IP address of the alarm sink to which alarms are to be sent
Port	UDP port for the SNMP alarms  Default setting: 162
Alarm Version	SNMP version in which the alarm is to be sent (v1 Trap, v2c Trap or v2c Inform)  Traps are sent once only; Informs, however, are repeated several times until confirmation of the alarm sink is received.
Community	Used to select the community (access protection)  The community set here must also be used on the manager side. A distinction is made between upper-case and lower-case characters.  <i>Communities are configured in the SNMP &gt; Manager menu.</i>
Inform Retry	Number of repetitions of an Inform (with v2c Inform only)  If after the final repetition of an Inform no confirmation of the alarm sink is received, this alarm is no longer sent.
Inform Timeout	Time which is to elapse before an inform is sent again (with v2c Inform only)
Inform Unack'd	Number of unconfirmed alarms which can be stored by the agent (with v2c Inform only)

### 2.6.3.13 Services > NTP Menu Window

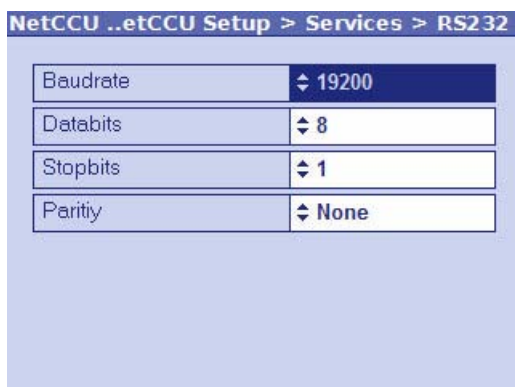
In the **NTP** (Network Time Protocol) menu window, you can set up synchronization for the transmitter system. This ensures that the time settings of all system components are synchronized via a common time server.



Function	Explanation
NTP mode	Used to deactivate NTP synchronization (disabled) or to activate NTP synchronization in step mode; the time is synchronized at the interval which is set under NTP sync-time (e.g. every 3 minutes)
NTP status	Used to set the current status (active/not active)
NTP sync-time	Used to set the interval at which the device time (client) is synchronized with the time of the time server
NTP server	IP address or name of the time server
Last sync date	Date of the last successful synchronization
Last sync time	Time of the last successful synchronization
Setup Date/Time (context menu)	Direct change to the <b>Date/Time</b> menu window

### 2.6.3.14 Services > RS232 Menu Window

In the **RS232** menu window, you can make settings for the RS-232-C interface.

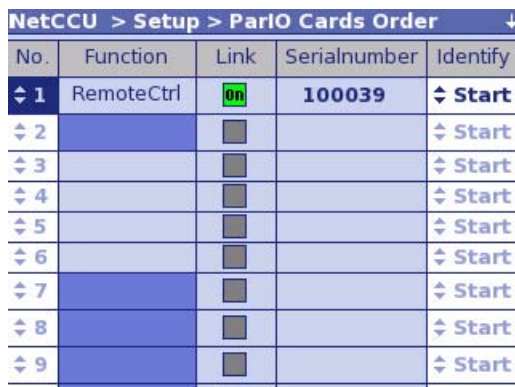


Function	Explanation
Baudrate	– As required; If DVB Receiver protocol is selected: setting occurs automatically If bitbus is used: 19200
Databits	Number of data bits of the serial interface (5 to 8)
Stopbits	Number of stop bits of the serial interface (1 / 1.5 / 2)
Parity	Parity setting

## 2.6.4 ParIO Cards Order Menu Window

You can use the **ParIO Cards Order** menu window to identify and assign parallel remote control interface cards. You need to do this when installing one or more new remote control interface cards.

**Note** *The window is only displayed if the use of a parallel remote control interface card has been enabled (see below).*



No.	Function	Link	Serialnumber	Identify
1	RemoteCtrl	on	100039	Start
2				Start
3				Start
4				Start
5				Start
6				Start
7				Start
8				Start
9				Start

Function	Description
No.	Position number of the parallel remote control interface card; the number is directly linked to the remote control interface card displayed at Serialnumber
Function	Function to which the remote control interface card is assigned
Link	Displays whether the remote control interface card is enabled
Serialnumber	Displays the available remote control interface cards
Identify	Identifies a remote control interface card (required when more than one remote control interface card is installed, or to check for activation)

### Assigning and identifying parallel remote control interface cards

Parallel remote control interface cards can be used for the following applications and administered and controlled with the NetCCU:

- Remote control of a transmitter (**RemoteCtrl**)
- Integration and control of transmitters from the NX7000 series or from other manufacturers into an n+1 system (**SimpleTx**)
- Integration and control of third-party equipment (**General Purpose ParIO**).
- Control of an antenna standby (**Antenna Redundancy**)

For the respective function (under **Function**) to be displayed, one or several of the following settings must be enabled:

#### For Remote Ctrl:

- NetCCU: **NetCCU > Setup > NetCCU Setup > System > Remote Control ParIO > standard (80/32) or mini (12/9)**
- NSU: **Switch over Unit > Setup > NSU Setup > Remote Control ParIO > enabled**
- NCU: **Tx Control Unit > Setup > NCU Setup > Remote Control ParIO > enabled**

#### For Simple Tx:

- NSU: **Switch Over Unit > Setup > Tx Setup > Tx A1 to Tx An or Tx B > Variant > Simple TX ParIO**
- NCU: **Tx Control Unit > Setup > Tx Setup > Tx A1 to Tx An or Tx B > Variant > Simple TX ParIO**

#### For General Purpose ParIO:

- NetCCU: **NetCCU > Setup > NetCCU Setup > System > General Purpose ParIO > enabled**
- NSU: **Tx Control Unit > Setup > NSU Setup > System > General Purpose ParIO > enabled**
- NCU: **Switch Over Unit > Setup > NCU Setup > System > General Purpose ParIO > enabled**

#### For Antenna Redundancy:

- NSU: **Switch Over Unit > Setup > NSU Setup > System > Antenna Redundancy > Main + Reserve or Upper + Lower**

The **Function** of the respective parallel interface card is displayed in a box highlighted in light or dark blue. Light-blue highlight for CAN Bus A, dark-blue highlight for CAN Bus B.

When a new parallel remote control interface card is installed, it is detected and displayed at a random position in the **Serial number** column. When more than one parallel remote control interface card is installed, it is usually necessary to identify the real card concerned.



To identify a card displayed in **Serial number**, highlight **IdentifyStart** in the column on the right and confirm with **OK**.

Click the relay of the card selected, and the card can be identified via this sound.

**Note** *If the card cannot be identified in this way, a helpful alternative is to install the cards one after another and to identify each card as soon as it is installed, labeling it appropriately.*

Each parallel remote control interface card displayed in a random row in the **Serial number** column after installation must then be assigned to a **function**. This is done by means of the position number (**No.** column) in the row in which the card is displayed.

1. Double click the position number (**No.**) of the displayed card.
2. From the editor, select the position number of the row in which the desired function is displayed (e.g. the **No.** next to **RemoteCtrl**) and click **OK** to confirm.

The selected parallel remote control interface card is assigned to the corresponding function (the function and card are in the same row).

### 2.6.5 General Purpose ParIO Menu Window

In the General Purpose ParIO menu window you can control and monitor third-party equipment (e.g. a generator or smoke detector) that is connected via a parallel remote control interface card.

**Note** *The window is only displayed if the use of a parallel remote control interface card for General Purpose ParIO in the **NetCCU > Setup > NetCCU Setup > Remote Control ParIO** menu is enabled.*

Depending on the remote control interface cards used, you now have 12 command (set) and 9 acknowledge (get) or 80 command (set) and 32 acknowledge (get) pins available.

**Note** *For technical reasons, the ratio of the available get and set ports is exactly the reverse compared to remote control interface cards used for controlling transmitters.*

NetCCU > Setup > General Purpose ParIO		
Link <span style="float: right;"><input type="checkbox"/></span>		
Get		
X40.01 <input type="checkbox"/>	X40.04 <input type="checkbox"/>	X40.07 <input type="checkbox"/>
X40.02 <input type="checkbox"/>	X40.05 <input type="checkbox"/>	X40.08 <input type="checkbox"/>
X40.03 <input type="checkbox"/>	X40.06 <input type="checkbox"/>	X40.09 <input type="checkbox"/>
Set		
X40.11 <input type="checkbox"/> Off	X40.15 <input type="checkbox"/> Off	X40.19 <input type="checkbox"/> Off
X40.12 <input type="checkbox"/> Off	X40.16 <input type="checkbox"/> Off	X40.20 <input type="checkbox"/> Off
X40.13 <input type="checkbox"/> Off	X40.17 <input type="checkbox"/> Off	X40.21 <input type="checkbox"/> Off
X40.14 <input type="checkbox"/> Off	X40.18 <input type="checkbox"/> Off	X40.23 <input type="checkbox"/> Off

Function	Explanation
Link	Indicator is green when the parallel remote control interface card has been identified and activated.

Function	Explanation
Get	Indicator is green when a port acknowledgment has been sent (e.g. generator is started)
Set	Sends (On) a request to the connected equipment (e.g. start of a generator)

## 2.7 RF Probe Antenna Menu

You can use the **RF Probe Antenna** menu to enter and read off the measurement values for the transmitter system, standby system and output power.

### 2.7.1 RF Probe Forward Menu Window

In the **RF Probe Forward** menu window you can define the nominal values for the output power and determine the lowest level of deviation at which fault messages are to be output. Two test points are available for measuring the RF power (RF Probe Forward and RF Probe Reflection). Each test point has two RF rectifiers so that you can measure both the forward and reflected power. The forward power is always measured using the first test point (RF Probe Forward).

In the R&S NetCCU800 status screen, the forward power (Forward) is displayed in the left-hand window and the reflected power (Reflection) in the right-hand window on the basis of the values entered here.

NetCCU .. obe Antenna > RF Probe Forward			
Measured Values			
Power	0	W	
Voltage	0.01	V	
Configuration			
Nominal Value	1 000	W	
RF Fail Limit	-3.0	dB	
RF Warning Limit	-1.0	dB	
Timeout RF Fail Control	6	s	
Calibration			
Gain	▶ Set	4.03	V
Offset	▶ Set	0.01	V

Function	Explanation
<b>Measured Values</b>	Measurement display
Power	Current forward power
Voltage	Currently measured DC voltage of the test point

Function	Explanation
<b>Configuration</b>	Definition and setting of a nominal value for forward power. Setting of upper and lower thresholds for forward power; warnings and fault messages are issued if these thresholds are violated.
Nominal Value	Used to enter the nominal value, determined if necessary by external measurement of the forward power
RF Fail Limit	Used to select a dB value referenced to the set nominal power for forward power; a fault message is issued if the actual value drops below the nominal value.
RF Warning Limit	Used to select a dB value referenced to the set nominal power for forward power; a warning is issued if the actual value drops below the nominal value
Timeout RF Fail Control	Used to select the time that the lower threshold for the forward power (specified as the RF Fail Limit) must be violated for before a fault message is output. For example, if a value of 3 dB has been entered as the RF Fail Limit and the actual value drops below that level for 8 seconds (typical setting for Timeout for RF Fail Control), a fault message will be output.
<b>Calibration</b>	Execution of calibration and display of the results.
Gain	Internal measurement value of the nominal value
Offset	Deviation from the zero value of the power display
Set Gain	Used to calibrate the internal measurement system. Set Gain assigns the currently measured DC voltage to the nominal value for transmitter power.
Set Offset	Used to calibrate the zero point as of which the externally measured power is displayed. Set Offset calibrates the zero point.

## 2.7.2 RF Probe Reflected Menu Window

In the **RF Probe Reflected** menu window you can define the nominal values for the output power and determine the lowest level of deviation at which fault messages are to be output. Two test points are available for measuring the RF power (RF Probe Forward and RF Probe Reflection). Each test point has two RF rectifiers so that you can measure both the forward and reflected power. The reflected power is always measured using the second test point (RF Probe Reflection).

In the R&S NetCCU800 status screen, the forward power (Forward) is displayed in the left-hand window and the reflected power (Reflection) in the right-hand window on the basis of the values entered here.

NetCCU ..obe Antenna > RF Probe Reflected			
<b>Measured Values</b>			
Power		0.0	W
Voltage		0.00	V
<b>Configuration</b>			
Nominal Value		0	W
Warning Limit		↕ -1.0	dB
<b>Calibration</b>			
Gain	▶ Set	0.00	V
Offset	▶ Set	0.00	V

Function	Explanation
<b>Measured Values</b>	Measurement display
Power	Current reflected power
Voltage	Currently measured DC voltage of the test point
<b>Configuration</b>	Setting of a warning threshold for the reflected power
Nominal Value	Forward power/50 (corresponds to the maximum reflected power)
Warning Limit	Used to select a dB value for the warning threshold referenced to the reflection switch-off threshold which is at a return loss of -17 dB (corresponding to a reflected power/forward power ratio of 1/50)
<b>Calibration</b>	Execution of calibration and display of the results
Gain	Internal measurement value of the nominal value
Offset	Deviation from the zero value of the power display
Set Gain	Used to calibrate the internal measurement system. Set Gain stores the internal measurement value for the entered (measured) nominal value.
Set Offset	Used to calibrate the zero point as of which the externally measured power is displayed. Set Offset calibrates the zero point.

## 2.8 Device Info Menu

Using the **Device Info** menu, you can have detailed product information displayed for every hardware and software component of the R&S NetCCU800.

## 2.8.1 NetCCU Menu Window

The **NetCCU** menu window displays general information about the hardware and software of the R&S NetCCU800.

NetCCU > Device Info > NetCCU	
Part Number	→ 2095.8007
Variant	→ 02
Product Index	→ 03.00
Serial Number	→ 100349
Product Date	→ 2007-01-01
SW/FW/BIOS Number	2095.8613.00
SW/FW/BIOS Version	1.16.4-1
Power up cycles	1642

## 2.8.2 Mainboard Menu Window

The **Mainboard** menu window displays information about the hardware and software of the R&S NetCCU800.

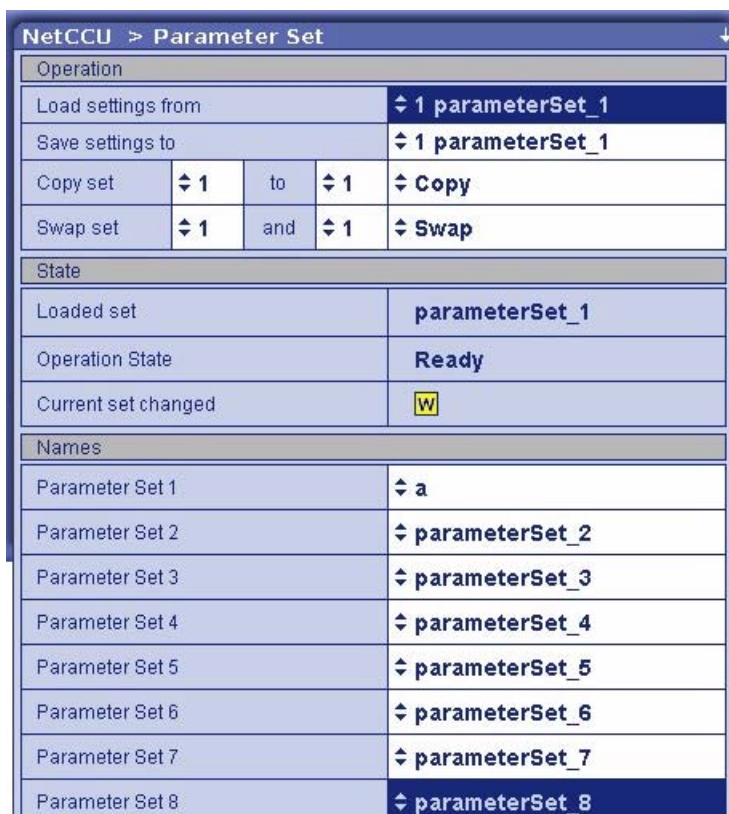
NetCCU > Device Info > Mainboard	
Part Number	→ 2095.8507
Variant	→ 02
Product Index	→ 05.02
Serial Number	→ 100377
MAC rear network	→ 00:90:B8:18:4B:5A
Product Date	→ 2006-07-18
SW/FW/BIOS Number	2095.8642.00
SW/FW/BIOS Version	01.09
Power up cycles	1642

## 2.9 Parameter Set Menu Window

In the **Parameter Set** menu window, you can create, load and save parameter sets for the settings of the R&S NetCCU800 and the components it controls. If the operating environment changes (e.g. change of frequency) you can access complete parameter sets instead of having to set each individual value. You have eight memory locations available in addition to the active memory location (for the parameter set loaded).

A parameter set consists of the following parameters:

- Settings for the test points (**RF Probes**), display value at nominal power (**Nominal Value**), calibration values (**Gain** and **Offset**) for the power displays
- Reference voltage for the forward power
- Virtually all exciter settings, with the exception of instrument-specific parameters (for detailed information, refer to the exciter manual, "Operation" section)



Function	Description
<b>Parameter Set</b>	
Load settings from	For selecting a parameter set as the current parameter set; the currently loaded parameter set acts as an independent copy of the stored parameter set.
Save settings to	For saving the currently active settings to the chosen memory location.
Copy set x to y	For selecting a parameter set x, the content of which you wish to save to another memory location y. To start the copying procedure, select Copy and confirm with OK.
Swap set x and y	For selecting two parameter sets x and y, the content of which you wish to swap. To start the swap procedure, select Swap and confirm with OK.
<b>State</b>	
Loaded Set	Displays the active (i.e. loaded) parameter set
Operation State	Display showing the status of the action that is being carried out (Ready, Loading, Saving, Copying)

<b>Function</b>	<b>Description</b>
Current Set Changed	Yellow: The device settings have been changed and no longer match the settings of the loaded parameter set.
<b>Names</b>	
Parameter Set 1	Name to describe the parameter set (e.g. intended use)
Parameter Set 2	See above
Parameter Set 3	See above
Parameter Set 4	See above
Parameter Set 5	See above
Parameter Set 6	See above
Parameter Set 7	See above
Parameter Set 8	See above

### 3 Menus of Exciter A/B

You can use the Exciter A/B menus to operate and configure the exciter concerned and to call up information.

*Note* The Exciter B menus and menu windows are identical to the Exciter A menus and menu windows.

#### 3.1 Overview of Menus

Exciter A ATSC	Description: Status
Status	This menu shows an overview about the current exciter status
Logbook	
Setup	
Operation	
Input	
ATSC Parameters	
Precorrection	
RF	
Reference	
Device Info	

Level 1 >	Level 2 >	Level 3 >	Level 4 >	Parameter
Status >				Displays: <ul style="list-style-type: none"> <li>- Sum Fault</li> <li>- RF</li> <li>- Exciter</li> <li>- Loop</li> <li>- Input</li> <li>- Input 1 connect</li> <li>- Input 2 connect</li> <li>- Reference</li> <li>- Option Key</li> <li>- Sum Warning</li> <li>- Output Terminated</li> <li>- Self Test</li> <li>- Temperature</li> <li>- Fan</li> <li>- Active Input</li> <li>- Datarate</li> <li>- Mute</li> <li>- Test signal</li> </ul>
Logbook >	Summary >			Logged information: <ul style="list-style-type: none"> <li>- No (consecutive numbering)</li> <li>- Message</li> <li>- Time</li> <li>- Date</li> <li>- Set or Reset (for warnings and error messages only)</li> </ul>
	Status >			
	Warning >			
	Fault >			



Level 1 >	Level 2 >	Level 3 >	Level 4 >	Parameter
Setup >	Tx Setup >			Setting items: – Tx Mode – Tx Name
Setup >	Option Keys >	Status >		Displays: – K – Name – Status: activated/ not activated – Validity
Setup >	Option Keys >	Install >		Setting items: – Option Key Displays: – Status – Message
Setup >	Option Keys >	Deactivation >		Displays: – K – Name – Response
Setup >	Exciter Setup >	Common >		Setting items: – Digital Standard Displays: – Amplifier Control
Setup >	Exciter Setup >	Date / Time >		Setting items: – Date – Time
Setup >	Exciter Setup >	Ethernet >		Setting items/displays for the rear Ethernet interface: – IP Address – Subnet Mask – Gateway  Displays for the Front Ethernet port: – IP Address – Subnet Mask – MAC
Setup >	Exciter Setup >	BitBus > <sup>a)</sup>		Setting items: – BitBus Protocol – TCP Port – Checksum Displays: – Connected Context menu: – Reconnect
Setup >	Exciter Setup >	SNMP > <sup>a)</sup>	General > <sup>a)</sup>	Setting items: – Port SET/GET – Inhibit Status – Max. not transmitted
Setup >	Exciter Setup >	SNMP > <sup>a)</sup>	Manager > <sup>a)</sup>	Setting items: – Access Level [1 to 5] – Community [1 to 5] – Enable [1 to 5]

Level 1 >	Level 2 >	Level 3 >	Level 4 >	Parameter
Setup >	Exciter Setup >	SNMP > <sup>a)</sup>	Alarmsinks > <sup>a)</sup>	Setting items: – Alarmsink – Enable – IP Address – Port – Alarm Version – Community
Operation >				Setting items: – Program – Carrier – Reset on program off Context menu: – Reset Fault
Input >	Input Config >			Setting items for Input 1 or Input 2: – Presel. Mode Displays for Input 1 or Input 2: – Packet Length – Meas. Data Rate – Req. Data Rate – Active Mode
Input >	Input Automatic >			Setting items: – Preselect Input – Autoswitch – Priority – Check Time Forward – Check Time Back – On Input Loss – Type of Loss of Input – Fail Delay Time
Pre correction >	Linear >			Setting items: – Linear Correction – Automatic (ADE) <sup>b)</sup> – Max Amplitude Ripple <sup>b)</sup> – Max Group Delay Ripple <sup>b)</sup> Displays: – Amplitude Ripple <sup>b)</sup> – Group Delay Ripple <sup>b)</sup> – Input Level <sup>b)</sup> – Automatic <sup>b)</sup>
Pre correction >	Nonlinear >			Setting items: – Nonlinear Correction – Automatic (ADE) <sup>b)</sup> – Threshold Shoulders <sup>b)</sup> Displays: – Shoulder Left <sup>b)</sup> – Shoulder Right <sup>b)</sup> – Input Level <sup>b)</sup> – Automatic <sup>b)</sup>

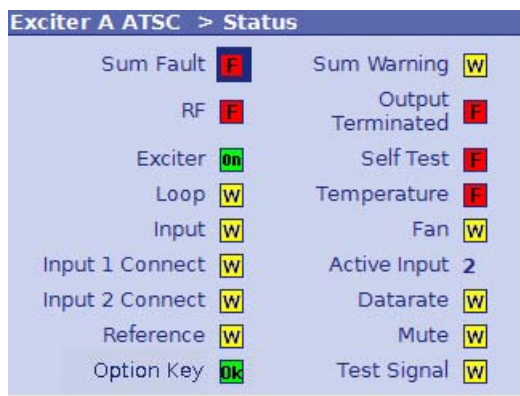
Level 1 >	Level 2 >	Level 3 >	Level 4 >	Parameter
RF >	Synthesizer >			Setting items: – Frequency – Reference – OCXO Adjust
RF >	Output >			Setting items: – RF Output – Regulation – Manual RF Level – Output Attenuation – RF Slope – Modulation Slope Displays: – AGC Regulation
RF >	IQ Adjust >			Setting items: – Auto I/Q Adjust (Start/Break) – I/Q Test Signal – Bias Coarse [I/Q] – Bias Fine [I/Q] – Gain [I/Q] – Phase Displays – Auto I/Q Adjust (Adjusted/Not Adjusted/ In Progress) – LO1 Frequency
RF >	Limiter >			Setting points for main limiter: – State – Level
Amplifier > <sup>c)</sup>	Setup > <sup>c)</sup>			Setting items: – Ref Voltage – Nominal Power – RF Fail Limit Displays: – RF Fail – Amplifier – Actual Power
Amplifier > <sup>c)</sup>	Calibration > <sup>c)</sup>			Setting items: – Ref Voltage – Nominal Power – Calibration Displays: – Actual Power – Calibration Power – Calibration Offset
Reference >				Setting items – Reference – OCXO Adjust – Mute on PPS Fail – Mute on Ref. Fail – Fail Delay Time

Level 1 >	Level 2 >	Level 3 >	Level 4 >	Parameter
Device Info >	Exciter >			Displays: – Part Number – Model – Product index – Serial Number – Product Date – Software Number – Software Version – Operating hours – Power up cycles
Device Info >	Boards >	Mainboard > Input Interface > RF Board > Synth 1 > <sup>d)</sup> Synth 2 > <sup>d)</sup> Synth 3 > <sup>e)</sup>		Displays: – Part Number – Model – Product index – Serial Number – Product Date – BIOS version (mainboard only) – Operating hours – Power up cycles

- a) The menu window is only displayed in the Single Low Power mode.
- b) The parameter displayed depends on the instrument model (variant) and/or ADE option.
- c) The menu window is only displayed in the low-power operating modes of the exciter.
- d) The menu window is displayed only for instrument models (variants) 60 and 61.
- e) The menu window is displayed only for instrument model 61 (with ADE option).

### 3.2 Status Menu

The **Status** menu summarizes the current status of the exciter. Color coding (green, yellow and red) is used to indicate status information, warnings and error messages. In addition, some basic settings are shown.



Display/LED	Color	Description
Sum Fault	Red	Sum-fault signal: One or more errors occurred

Display/LED	Color	Description
RF	Green	The RF level at the exciter output is OK
	Red	There is no RF level at the exciter output even though the RF output is enabled
	- OFF -	There is no RF level at the exciter output since the RF output is not enabled ("manually" disabled)
Exciter	Green	RF output of the exciter is enabled  There are several options for enabling the RF output: <ul style="list-style-type: none"> <li>- using the RF Output setting item in the RF menu</li> <li>- on the R&amp;S NetCCU800 via the <b>ON</b> key</li> <li>- on the exciter via the <b>ON</b> key (if a R&amp;S NetCCU800 is not present or is inactive)</li> </ul>
Loop	Yellow	RF interlock loop not closed
	Green	RF interlock loop closed
Input	Green	Valid transport stream present on the active input
	Yellow	Invalid transport stream on the active input (connected with the setting Type of Loss of Input = Warning, see the section "Input > Input Automatic")
	Red	Invalid transport stream on the active input (connected with the setting Type of Loss of Input = Fault, see the section "Input > Input Automatic")
Input 1 connect	Green	Input signal present at input <b>TS 1 IN</b>
	- OFF -	No input signal on input <b>TS 1 IN</b>
Input 2 connect	Green	Input signal present at input <b>TS 2 IN</b>
	- OFF -	No input signal on input <b>TS 2 IN</b>
Reference	Green	External reference frequency present and OK
	Yellow	External reference frequency not OK
	Red	External reference frequency is not OK and the fail delay time set in the Reference menu has expired
	- OFF -	External reference frequency not present, but not actually needed
Option Key	Green	All options required for the current transmitter operating mode are installed
	Yellow	A temporarily installed option will expire shortly
	Red	An important option for the current transmitter operating mode is missing
Sum Warning	Yellow	One or more warnings are active

Display/LED	Color	Description
Output Terminated	Red	The cable-break sensor has reported that the RF output is not terminated
Self Test	Red	A hardware fault has occurred in one or more modules of the exciter; detailed information about the fault is recorded in the log-book
Temperature	Red	At least one module is overheating
Fan	Yellow	A fan has failed; there is a possibility of overheating
	Red	Both fans have failed; there is an acute risk of overheating
Datarate	Yellow	Wrong data rate on the active input
Mute	Yellow	Output signal from signal processing disabled
Test signal	Yellow	Exciter is set to test mode

### 3.2.1 Status Displays, Warnings, and Error Messages

When warnings and error messages occur, this usually means that transmission operation is impaired. Different signal colors are used to distinguish the severity of an impairment or the "quality" of the defect. The following applies:

Status display	green [OK]	Transmission is not impaired.
Warning	yellow [W]	Although the exciter is functional, external influences may impair transmission or transmission operation.
Error message	red [F]	A severe error has occurred so that transmission operation is generally not possible.

**Note** *This type of LED signaling using colors and abbreviations (OK, W, F, etc) is identical for the complete menu.*

#### Indications with and without memory effect

Status displays (green) and warnings (yellow) always reflect the current status of the exciter. On the other hand, error messages (red) remain active even after the reason for the error has passed or the error has been corrected. If the error has been corrected, you can reset the error display with the RESET key.

## 3.3 Logbook Menu

The logbook is used to record changes in state (events) of the exciter.

**Menu windows**

The **Logbook** menu branches to the following menu windows:

- **Summary:** Complete logbook with all recorded data
- **Status:** Partial logbook with recorded status changes
- **Warning:** Partial logbook with recorded occurrences of warnings
- **Fault:** Partial logbook with recorded occurrences of error messages

**3.3.1 Logbook > Summary/Status/Warning/Fault**

Exciter A ATSC > Logbook > Summary ↓			
No	Message	Time	Date
128	↑ Reboot	00:00:00	05-10-10
127	↑ Reboot	00:00:00	05-10-10
126	↑ Reboot	00:00:00	05-10-10
125	↑ Reboot	00:00:00	05-10-10
124	↑ Reboot	00:00:00	05-10-10
123	↑ Reboot	00:00:00	05-10-10
122	↑ Reboot	00:00:00	05-10-10
121	↑ Reboot	00:00:00	05-10-10
120	↑ Reboot	00:00:00	05-10-10

The complete logbook and the partial logbooks are uniformly structured. The messages are numbered sequentially and contain the following information:

- Identification for occurrence ↑ or disappearance ↓ of an event
- Message: Brief description of the event
- Time: Time of day of the event
- Date: Date of the event

*Note* Up to 256 entries can be saved in every partial logbook. The most current 128 entries of the partial logbook will be grouped in the complete logbook.

**3.3.2 Logbook Context Menu**

Additional context functions are available in the menu windows for the complete logbook and the partial logbooks:

Function	Explanation
Clear logbook	<p>Clears all entries in the current logbook; clearing individual logbook entries is not possible.</p> <p><i>When you clear the complete logbook, the partial logbooks are also cleared. A Reset Fault is triggered at the same time.</i></p>

Function	Explanation
Restore logbook	Restores the cleared entries in the current logbook.  <i>When you restore the complete logbook, the partial logbooks are also restored.</i>

## 3.4 Setup Menu

The menu windows in the **SETUP** menu are used to make basic settings for transmission operation, signal processing and operating the exciter.

### Menu windows

The **Setup** menu branches to the following menu windows and menu paths:

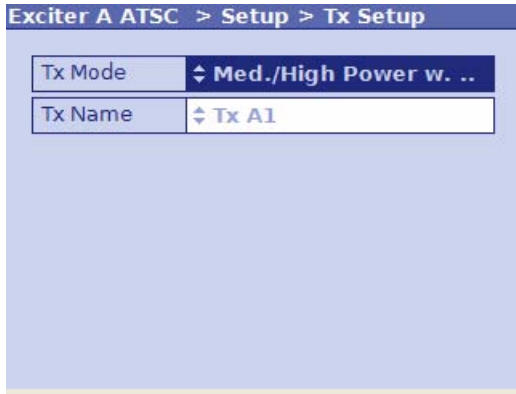
- **Tx Setup**: Used to set the transmitter operating mode
- **Option Keys > Status**: Status of the available software options
- **Option Keys > Install**: Used to activate or, if necessary, deactivate software options
- **Option Keys > Deactivations**: Displays deactivated software options
- **Exciter Setup > Common**: Used to enter the basic settings for signal processing
- **Exciter Setup > Date/Time**: Used to enter the current date and time (only required for "Single Low Power" transmitter operating mode)
- **Exciter Setup > Ethernet**: Used to configure the Ethernet interface of the exciter (only possible in the "Single Low Power" transmitter operating mode)
- **Exciter Setup > BitBus**: Used to activate and configure the BitBus communication via Ethernet (only possible in the "Single Low Power" transmitter operating mode)
- **Exciter Setup > SNMP** menu path: Used to configure the SNMP connection (only possible in the "Single Low Power" transmitter operating mode)

**Note** *Only the menu windows relevant to medium-power and high-power transmitters (i.e. **Tx Setup**, **Exciter Setup > Common** and **Option Keys > ...**) are described below.*

### 3.4.1 Setup > Tx Setup

The **Tx Setup** menu window is used to set the exciter software to the appropriate transmitter operating mode.





Setting item	Explanation
Tx Mode	<p><i>Used to set the transmitter operating mode</i></p> <p>The options are as follows:</p> <ul style="list-style-type: none"> <li>– Med./High Power with NetCCU: Operation in a medium-power or high-power transmitter with an R&amp;S NetCCU800 as the operator station and control unit</li> <li>– Low Power with NetCCU: Operation in a low-power transmitter with an R&amp;S NetCCU800 as the operator station</li> <li>– Low Power 1+1: Operation in a 1+1 standby system for low-power transmitters with an R&amp;S NetCCU800 switchover unit (NSU) as the higher-level switching unit and operator station</li> <li>– Low Power N+1: Operation in an N+1 standby system for low-power transmitters with an R&amp;S NetCCU800 switchover unit (NSU) as the higher-level switching unit and operator station</li> <li>– Single Low Power: Operation in a low-power transmitter; operated via a connected PC and web browser</li> </ul> <p>In order to switch between two transmitter operating modes, the exciter must be rebooted <sup>a)</sup>. The associated user interface is loaded.</p>
Tx Name	<p>Used to set an address to allow the NSU to identify the low-power transmitter within an N+1 standby system</p> <p>The options are as follows:</p> <ul style="list-style-type: none"> <li>– Tx A1 to Tx A8: Address range for a main transmitter</li> <li>– Tx B: Address for the standby transmitter</li> </ul> <p><i>The setting item "Tx Name" is only active in the transmitter operating mode "Low Power N+1".</i></p>

a) To reboot the exciter, disconnect it briefly from the AC power supply or execute the Reboot Tx command in the Tx Setup context menu.

### 3.4.1.1 Setting Transmitter Operating Mode

The exciter can be used in either a medium/high-power transmitter or a low-power transmitter.

In the first case a R&S NetCCU800 assumes control of the power amplifiers connected to the rack controller. In the case of a low-power transmitter the amplifiers are connected to the exciter, which also delivers the control signals.

Each version requires slightly different setup options. These can be enabled with the aid of the **Tx Mode** parameter. In the case of low power, a further distinction is made between two single transmitter modes and two standby modes (see table).

On delivery from the factory, the **Med./High Power w. NetCCU** operating mode is preset as standard. When a low-power transmitter is brought into use for the first time, its operating mode must therefore be changed. The settings do not take effect until the exciter has been rebooted.<sup>1</sup>

**Note** *Depending on the configuration of the instruments concerned, it may no longer be possible to operate the exciter after having changed the operating mode via R&S NetCCU800 or NSU. This problem can be solved as follows:*

*a) Configure the operating mode appropriately in the R&S NetCCU800/NSU menu or b) correct incorrect settings via the web interface of the exciter.*

### 3.4.2 Setup > Option Keys Submenu

Certain features of the device are activated using the Option Keys mechanism.

Each available software option can be enabled by installing a valid *activation key*. If a software option is later no longer required, activation can be canceled again by installing a *deactivation key*.

**Note** *The deactivation mechanism allows software options which are no longer required to be "returned" to Rohde & Schwarz.*

Option keys are available from your local Rohde & Schwarz sales partners.

#### Installing option keys

Option keys can be installed in three ways:

- Automatic installation of one or more activation keys using the Software Distributor  
The procedure is the same as for performing software updates (see the chapter "Maintenance").
- Installation of an option key by means of a web browser  
With this method, the option key can be transferred from, for example, a received mail using the copy/paste function.
- Installation of an option key directly at the display  
With this method, a 30-digit code is entered using the keyboard.

The two last methods use the installation menu **Setup > Option Keys > Install** described below.

---

<sup>1</sup> To reboot, briefly disconnect the exciter from the AC power supply.

**3.4.2.1 Setup > Option Keys > Status**

The **Option Keys > Status** menu window lists the available software options with their respective activation status.

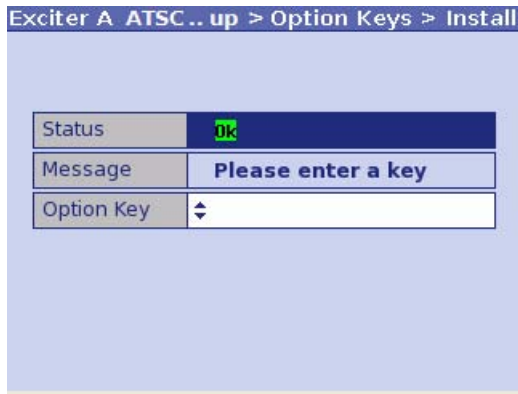
Exciter A ATSC .. up > Option Keys > Status		
K	Name	Validity
K12	DVB-T	<input type="checkbox"/>
K04	DVB-H	<input type="checkbox"/>
K13	ATSC-MFN	<input checked="" type="checkbox"/> Permanent
K09	A-VSB	<input type="checkbox"/>
K02	SNMP	<input checked="" type="checkbox"/> Permanent
K05	ADE	<input checked="" type="checkbox"/> Permanent
K11	Ext. Group Delay	<input type="checkbox"/>
K00	Demo	<input type="checkbox"/>

List column	Explanation
K	The K material number and stock number of the device are used to order an option key to activate a software option from Rohde & Schwarz sales partners.
Name	Name of the software option
—	Status of a software option: – Green (OK): Option has been activated – Gray: Option has not been activated
Validity	Validity period of an installed option key: – Permanent: Option activated for an unlimited period (standard license) – "Expiry date": Option remains activated until the displayed expiry date (e.g. as a test license)  <i>If the activation mechanism is not supported by the hardware, all software options are activated automatically (status = OK). In this case, no validity period is displayed in the Validity column.</i>

**Note** There must be (at least) one software option activated for the TV standard in order that the exciter can generate an RF signal at the output.

**3.4.2.2 Setup > Option Keys > Install**

The **Option Keys > Install** menu window is used to install option keys manually.



Setting item	Description
Option Key	Used to enter a 30-digit code to activate (or deactivate) a software option. Entry of the code is completed with <b>Enter</b> or <b>OK</b> .

Display	Description
Status	<ul style="list-style-type: none"> <li>- Status = OK: The mechanism used to activate/deactivate software options is supported by the hardware. To be able to use a software option, the associated option key must be installed.</li> <li>- No key Required: The mechanism used to activate/deactivate software options is not supported by the hardware. All available software options can be used without installing option keys.</li> </ul>
Message	Dialog box with the following messages: <ul style="list-style-type: none"> <li>- Please enter a key: Prompt to enter a key</li> <li>- Key OK: Key entered successfully (the display changes back to "Please enter a key" after a few moments)</li> <li>- Key deactivated: Deactivation key entered successfully (the display changes back to "Please enter a key" after a few moments)</li> <li>- Invalid format: Invalid key entered</li> </ul>

### 3.4.2.3 Setup > Option Keys > Deactivations

The **Option Keys > Deactivations** menu window lists software options which were once active, but have been deactivated again using a deactivation key.

Exciter A ATSC .. tion Keys > Deactivations		
K	Name	Response
K05	ADE	0A91555059257504F

Column	Explanation
K	The K material number and stock number of the device are used for ordering an option key to activate a software option from Rohde & Schwarz sales partners.
Name	Name of the software option
Response	Acknowledgment code as a system response to a deactivation  To prove that a software option has been deactivated, the acknowledgment code must be sent to the Rohde & Schwarz sales partner (e.g. by e-mail).

### 3.4.3 Setup > Exciter Setup > Common

The **Exciter Setup > Common** menu window is used to enter the default settings for signal processing.

Exciter A ATSC .. Exciter Setup > Common	
Digital Standard	ATSC
Amplifier Control	OFF

Setting item	Description
Digital Standard	Selection of the digital TV standard: DVB-T, DVB-H or ATSC  To switch over from DVB-T or DVB-H to ATSC you need to reboot <sup>a)</sup> the exciter. At the same time signal processing is switched over and the associated user interface is loaded.

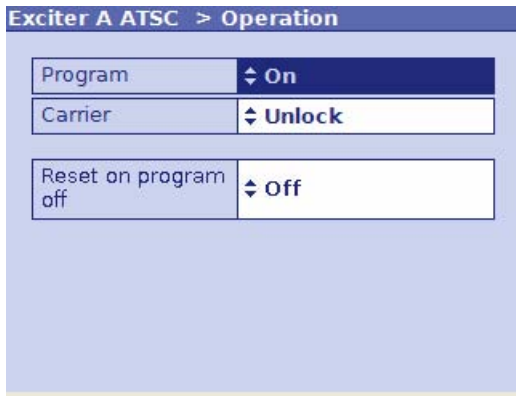
- a) To reboot the exciter, disconnect it briefly from the AC power supply or execute the Reboot Tx command in the Tx Setup context menu.

Display	Description
Amplifier Control	Status display for amplifier control  <i>In R&amp;S low-power transmitters, the exciter takes over amplifier control.</i>

### 3.5 Operation Menu

The **Operation** menu window provides functions used to switch the program on and off and to deactivate an RF carrier loop.

The context menu also provides a function used to reset fault indicators.



Setting item	Explanation
Program	Used to enable (ON) or disable (OFF) the RF output  The function has the same effect as the <b>ON</b> key on the front of the exciter and, like this key, is only intended for use with the Single Low Power mode only.  <i>As soon as an R&amp;S NetCCU800 or NSU takes control of the transmitter, the function has no effect.</i>

Setting item	Explanation
Carrier	Control command for an R&S NetCCU800  With the switch set to Unlock, an RF carrier loop initiated by the R&S NetCCU800 can be removed in certain service situations.  These service situations include: – replacement of the exciter – Failure of the R&S NetCCU800 in standby systems  <i>As soon as an R&amp;S NetCCU800 or NSU takes control of the transmitter, the function has no effect.</i>
Reset on program off	In the ON switch position, a Reset Fault is automatically triggered when the RF output is locked (Program = OFF).
Reset Fault (context menu)	Used to reset fault indicators  The function has the same effect as the <b>RESET FAULT</b> key on the front panel of the exciter and also belongs to the range of functions available for remote operation via the R&S NetCCU800.

### 3.6 Input Menu

The menu windows in the **INPUT** menu can be used to configure up to two input channels.

#### Menu windows

The **Input** menu leads to the following menu windows:

- **Input Config:** Configure input data streams, and display of data format, packet length, and data rate
- **Input Automatic:** For preselecting operating input, configuring automatic input switch-over, and setting behavior in the event of input signal failure

#### 3.6.1 Input > Input Config

Exciter A ATSC > Input > Input Config		
	Input 1	Input 2
Presel. Mode	↕ SMPTE	↕ SMPTE
Packet Length	188	188
Meas. Data Rate [bps]	0	0
Req. Data Rate [bps]	0	0
Active Mode	SMPTE	SMPTE

Setting item	Explanation
Presel. Mode [Input 1/Input 2]	<p>Sets the data format for the two data streams (main and standby signals) on inputs TS 1 IN or TS 2 IN.</p> <p>The options are as follows:</p> <ul style="list-style-type: none"> <li>– AUTO: The data format is recognized automatically</li> <li>– ASI: Manual setting for an ASI transport stream</li> <li>– SMPTE: Manual setting for an SMPTE transport stream</li> </ul>

Display	Explanation
Packet Length [Input 1/Input 2]	Displays the packet length detected at the respective input
Meas. Data Rate [bps] [Input 1/Input 2]	Displays the <i>data rate measured</i> at the respective input without null packets
Req. Data Rate [bps] [Input 1/Input 2]	Display for checking the measured data rate. The <i>maximum data processing rate</i> is displayed.
Active Mode	<p>Displays the data format detected or set at the respective input:</p> <ul style="list-style-type: none"> <li>– ASI: As described</li> <li>– SMPTE: As described</li> <li>– AUTO: Auto is selected and there is no data stream</li> </ul>

### 3.6.1.1 Checking Measured Data Rate

By comparing the **Meas. Data Rate [bps]** and **Req. Data Rate [bps]**, it is possible to check that the input buffers (FIFOs) are neither overflowing nor underflowing (both cases would result in transmission interruptions).

#### Maximum data processing rate

First, all null packets are removed from the transport stream. The associated useful data rate is measured and displayed under **Measured Data Rate**. Trouble-free operation is possible provided that this measurement value remains below the value for **Required Data Rate**.

**Note** *After the useful data rate has been measured, stuffing to the required data rate is performed, i.e. the difference between **Required Data Rate** and **Measured Data Rate** is compensated by inserting null packets.*



### 3.6.2 Input > Input Automatic

Exciter A ATSC > Input > Input Automatic		
Preselect Input	⇅	INPUT1
Autoswitch	⇅	ON
Priority	⇅	EQUAL
Check Time Forward	⇅	4 s
Check Time Back	⇅	4 s
On Input Loss	⇅	Mute
Type Of Loss Of Input	⇅	Warning
Fail Delay Time	⇅	10 s

Setting item	Description
Preselect Input	Preselection of inputs – INPUT 1: Operating input is TS 1 IN. – INPUT 2: Operating input is TS 2 IN.
Autoswitch	Activates and deactivates <i>automatic input switchover</i>  In the event of a failure on the active operating input, automatic switchover to the standby input takes place. The automatic switchover mode is defined by the following parameter settings.
Priority	Selects the <i>priority mode</i> – EQUAL: The preselected operating input and standby input have the same priority. Once a switchover has taken place the system does not normally switch back to the previously faulty operating input. – PRIO: The preselected operating input is the priority input. Once a switchover has taken place the system switches back to the preselected operating input as soon as the signal reappears.
Check Time Forward	For setting a delay time (0 to 60 s) which must elapse before the switchover to the standby input takes place in the event of a failure on the operating input
Check Time Back	For setting a delay time (0 to 60 s) which must elapse before switching back to the preselected operating input after switching over from the standby input (which is no longer active)  <i>The function has no effect if the priority mode is set to EQUAL.</i>
On Input Loss	For setting the behavior in the event of a defective input signal (synchronization error) – No Mute: The output signal is not suppressed (only effective with MFN) – Mute: The output signal is suppressed if the data rate is incorrect (recommended for SFN)

Setting item	Description
Type of Loss of Input	Selection: – Warning: If the input signal fails, only a warning will be generated. – Fault: If the input signal fails, an additional sum fault will be generated after the time set under Fail Delay Time has elapsed. In the case of transmitters with exciter standby, switchover to the second exciter occurs.
Fail Delay Time	For setting a delay time which must elapse after an input signal dropout before a general fault is generated.

### 3.6.2.1 Automatic Input Switchover

The exciter has a circuit for automatic switchover from one input to the other following a signal failure, provided that a valid signal is present at the second input. Before a failure occurs, the preselected input is active.

The mode of this automatic switchover circuit is defined by the following factors:

- Automatic: ON or OFF (**Autoswitch**)
- Delay times until switchover (**Check Time Forward** and **Check Time Back**)
- Priority mode: Inputs have equal priority or the preselected input has priority (Priority)

#### Automatic input switchover ON/OFF

If automatic switchover is OFF, the preselected input remains active even if the input signal fails.

If automatic switchover is ON and there is a failure at the preselected input, switchover to the associated standby input takes place.

#### Priority mode PRIO (input priority)

Following a switchover of the preselected input, the automatic system switches back to this priority input as soon as a signal reappears. Switchover is delayed for the set delay times.

If the signal fails at both the operating input and the standby input, the priority input remains active.

#### Priority mode EQUAL (equal input priority)

Following a switchover of the preselected input, the standby input with the same priority remains active until the input signal fails on this input also. The automatic system switches back to the preselected input, but only if a signal is present on it once again. Switchover is delayed for the set delay times.

**Note** *Selecting this operating mode keeps to a minimum the number of switchover operations and in certain cases the number of breaks in transmission (in the case of unsynchronized input streams).*

### 3.6.2.2 Behavior with Defective Input Signal

The behavior in the event of a defective input signal can be influenced by the **On Input Loss** switch as follows:

- **Mute:** The output signal of the exciter is suppressed as soon as synchronization with the input signal (from the operating input *and* standby input) is no longer possible.
- **No Mute:** The output signal of the exciter is not suppressed even though the input signal is defective. Only null packets are transmitted.

## 3.7 Precorrection Menu

Using the menu windows in the **Precorrection** menu, you can activate or deactivate linear and nonlinear precorrectors individually without having to call up the precorrector GUI (see the section "Introduction to Precorrector Operation" in the chapter "Operating" of the exciter manual).

If the software option "ADE" (K05) has been activated, additional functions for the automatic mode are available. The switch settings (On/Off) correspond to the related settings in the precorrector GUI.

### Menu windows

The **Precorrection** menu branches to the following menu windows:

- Linear: Switches linear precorrection on or off completely; settings for the ADE option (if available)
- Nonlinear: Switches nonlinear precorrection on or off completely; settings for the ADE option (if available)

### 3.7.1 Precorrection > Linear

Exciter A ATSC > Precorrection > Linear	
Linear Correction	↕ On
Automatic (ADE)	↕ Adaptive
Max Amplitude Ripple	↕ 0.500 dB
Max Group Delay Ripple	↕ 300.00 ns
Amplitude Ripple	0.203 dB
Group Delay Ripple	240.45 ns
Input Level	OK
Automatic	Active

Setting item <sup>a)</sup>	Explanation
Linear Correction	Switches the entire linear precorrection on or off.
Automatic (ADE)	Sets the operating mode: <ul style="list-style-type: none"> <li>– Manual: linear precorrection is performed manually</li> <li>– Adaptive: linear precorrection is performed in the automatic mode</li> </ul>
Max Amplitude Ripple	Sets a limit value for the permitted amplitude ripple in dB; setting range: 0.1 to 2 dB  <i>If the set value is exceeded, a new characteristic is calculated and set.</i>
Max Group Delay Ripple	Sets a limit value for the permitted group delay ripple in ns; setting range: 10 to 500 ns  <i>If the set value is exceeded, a new characteristic is calculated and set.</i>

a) Except for the first setting item, the other setting items are only displayed if the exciter is equipped with the option "automatic precorrection" (ADE).

Display <sup>a)</sup>	Description
Amplitude Ripple	Displays the residual ripple in the amplitude frequency response attained by the circuit for automatic switchover
Group Delay Ripple	Displays the residual ripple in the group delay attained by the circuit for automatic switchover
Input Level	Status of RF input level: <ul style="list-style-type: none"> <li>– OK: RF level on channel RF2 is within operating range</li> <li>– Failure: channel RF2 is not connected</li> <li>– Too Low: the RF level in the RF2 channel is too low – increase input level</li> <li>– Too High: the RF level in the RF2 channel is too high – decrease input level</li> </ul>
Automatic	Status of automatic switchover circuit: <ul style="list-style-type: none"> <li>– Active: the automatic switchover circuit and the precorrection are switched on and wait for the system to be enabled for the next precorrection cycle</li> <li>– Measure: the automatic switchover circuit is in the measurement cycle and determines the measured values</li> <li>– Calculate: the automatic switchover circuit calculates the new characteristics based on the measured values and sets them.</li> <li>– Disabled: the automatic switchover circuit is activated; the precorrector is still switched off</li> </ul>

a) All display fields are only displayed if the exciter is equipped with the option "automatic precorrection" (ADE).

**Note** *Further information on how to operate the precorrector can be found in the section "Setting Linear Precorrection" in the chapter "Operating" of your exciter manual.*

### 3.7.2 Precorrection > Nonlinear

Exciter A ATSC .. Precorrection > Nonlinear	
Nonlinear Correction	↕ On
Automatic (ADE)	↕ Adaptive
Threshold Shoulders	↕ 38.0
Shoulder Left	37.0 dB
Shoulder Right	37.0 dB
Input Level	OK
Automatic	Active

Setting item <sup>a)</sup>	Explanation
Nonlinear Correction	Switches the entire nonlinear correction on or off.
Automatic (ADE)	Sets the operating mode: – Manual: nonlinear precorrection is performed manually – Adaptive: nonlinear precorrection is performed in the automatic mode
Threshold Shoulders	Sets a limit value for the permitted shoulder attenuation in dB; setting range: 20 to 40 dB  <i>If the set value is underrun, a new characteristic is calculated and set.</i>

a) Except for the first setting item, the other setting items are only displayed if the exciter is equipped with the option "automatic precorrection" (ADE).

Display <sup>a)</sup>	Description
Shoulder Left	Displays the shoulder attenuation to the left of the signal spectrum attained by the automatic switchover circuit
Shoulder Right	Displays the shoulder attenuation to the right of the signal spectrum attained by the automatic switchover circuit
Input Level	Status of RF input level: – OK: RF level on channel RF1 is within operating range – Failure: channel RF1 is not connected – Too Low: the RF level in channel RF1 is too low – increase input level – Too High: the RF level in channel RF1 is too high – decrease input level

Display <sup>a)</sup>	Description
Automatic	Status of automatic switchover circuit: – Active: the automatic switchover circuit and the precorrection are switched on and wait for the system to be enabled for the next precorrection cycle – Measure: the automatic switchover circuit is in the measurement cycle and determines the measured values – Calculate: the automatic switchover circuit calculates the new characteristics based on the measured values and sets them. – Disabled: the automatic switchover circuit is activated; the precorrector is still switched off

a) All display fields are only displayed if the exciter is equipped with the option "automatic precorrection" (ADE).

**Note** Further information on how to operate the precorrector can be found in the section "Setting Nonlinear Precorrection" in the chapter "Operating" of your exciter manual.

## 3.8 RF Menu

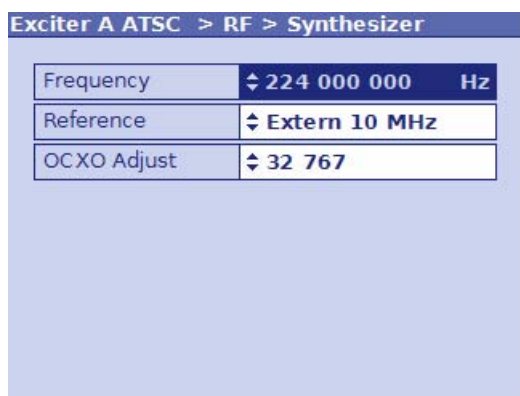
The menu windows in the **RF** menu are used to make the settings for frequency generation, modulation and RF monitoring.

### The menu windows

The **RF** menu leads to the following menu windows:

- **Synthesizer:** Set pilot frequency and reference frequency source
- **Output:** Used to enable the RF output, to activate output level control or set the level manually, or to correct the amplitude frequency response of subsequent components
- **IQ Adjust:** Used to adjust the modulator
- **Limiter:** Used to suppress signal peaks in the output spectrum and/or baseband

### 3.8.1 RF > Synthesizer



Setting item	Explanation
Frequency	Setting of the pilot frequency
Reference	<p>Selecting the reference source for stabilization of the frequency processing (<i>reference frequency source</i>). The following settings are possible:</p> <ul style="list-style-type: none"> <li>– Internal: Operation without external reference frequency source</li> <li>– External 5 MHz: Operation with external 5 MHz reference</li> <li>– External 10 MHz: Operation with external 10 MHz reference</li> <li>– External 1pps: Operation with external time reference (1 pps)</li> </ul> <p><i>The same setting options can be found in the RF &gt; Reference menu window.</i></p>
OCXO Adjust	<p>Used to adjust an internal OCXO frequency (for operating mode "Internal")</p> <p><i>The same setting options can be found in the RF &gt; Reference menu window.</i></p>

### 3.8.1.1 Reference Frequency Source

The basis for frequency generation is a 10 MHz oven-controlled crystal oscillator (OCXO). This OCXO can be operated in different modes:

#### "Internal" mode

The OCXO runs in uncontrolled mode.

It obtains its control voltage via a D/A converter which can be set using the **OCXO adjust** setting item. The OCXO can be adjusted via the **10 MHz MONITORING** test output (front panel of exciter).

#### "External 5 MHz" and "External 10 MHz" modes

The OCXO runs in controlled mode.

Due to the control, the control voltage generated by the D/A converter is adapted on an on-going basis so that the 10 MHz frequency of the OCXO is synchronized with the externally supplied 5 MHz or 10 MHz reference frequency.

#### "External 1pps" mode

The OCXO runs in controlled mode.

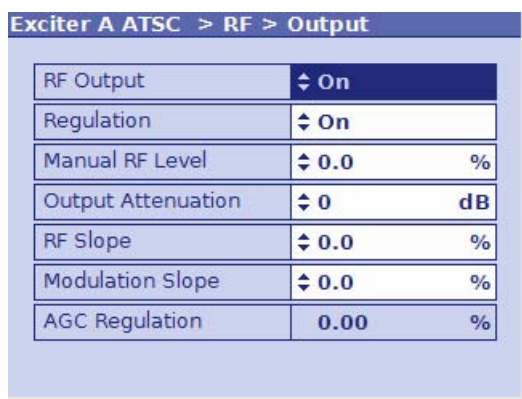
The 10 MHz frequency of the OCXO is synchronized with the external seconds pulse. In this mode, for example, SFN operation is possible without separate feed of a 10 MHz reference.

### 3.8.1.2 Holdover Mode (if reference frequency fails)

As soon as a failure of the external reference frequency is detected, the control voltage for the OCXO is no longer modified. The result of this is that the RF generation is now based on the stability of the OCXO.

As soon as the external reference frequency is restored, the control voltage on the OCXO will be controlled again with the externally supplied reference frequency.

### 3.8.2 RF > Output



Setting item	Description
RF Output	Enables (On) or disables (Off) the RF output.
Regulation	Activates (On) or deactivates (Off) the <i>output level control</i> . During transmission operation, control must be enabled.  <i>The current status of the related level adjuster is displayed as a percentage under RF &gt; RF Monitor &gt; AGC Exciter.</i>
Manual RF Level	Manual setting of the <i>output level</i> ; the setting has an effect only if output level control is deactivated.  <i>The current status of the related level adjuster is displayed as a percentage under RF &gt; RF Monitor &gt; AGC Exciter.</i>
Output Attenuation	For level adaptation purposes, an integrated attenuator with a value of 3 dB, 6 dB or 9 dB can be connected. <i>This has no influence on the level control.</i>
RF Slope	Correction of a slope of the amplitude frequency response in the spectrum for equalizing subsequent components (output stage, filter).
Modulation Slope	Correction of a curvature of the amplitude frequency response in the spectrum for equalizing subsequent components (output stage, filter).



Display	Description
AGC Regulation	Displays the level of the output level control

### 3.8.2.1 Output Level Control

The output power delivered by the exciter is set to the nominal output level of 13 dBm by means of a controller.

For test purposes, this controller can be deactivated. The output level is then set via the **Manual RF Level** control element.

*Note* If **Manual RF Level** is set too low, the **RF FAIL** fault will be generated.

### 3.8.3 RF > IQ Adjust

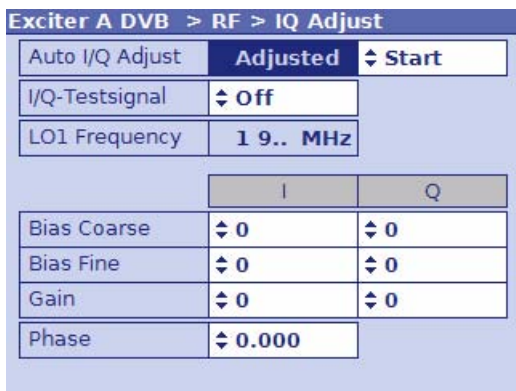
When the exciter is delivered, the I/Q modulator is factory-adjusted so that no customer intervention is normally required. If a further I/Q adjustment is needed at a later time, the menu window **RF > IQ Adjust** offers the associated setting options.

*Note* In the section "Maintenance" (exciter manual), you will find a description of how to perform the I/Q adjustment.

The I/Q adjustment depends on the automatically selected intermediate frequency LO1. Accordingly, it applies only to the intermediate frequency displayed under LO1 Frequency.

*Note* The following table shows the relationship between the set vision carrier frequency and intermediate frequency LO1:

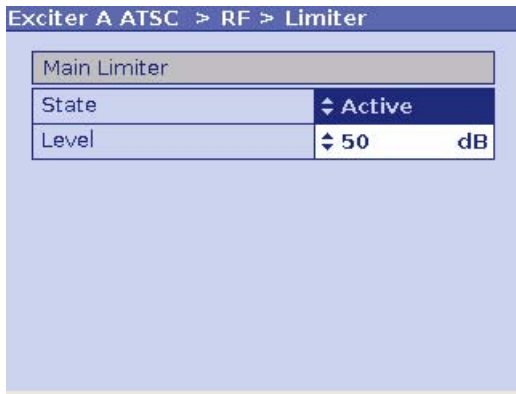
<b>Vision carrier frequency</b>		<b>Intermediate frequency</b>
47 MHz ≤ fB < 510 MHz	⇒	LO1 = 2160 MHz
510 MHz ≤ fB < 580 MHz	⇒	LO1 = 1920 MHz
580 MHz ≤ fB < 680 MHz	⇒	LO1 = 2160 MHz
680 MHz ≤ fB < 860 MHz	⇒	LO1 = 1920 MHz



Setting item/Displays	Explanation
Auto I/Q-Adjust	<p>Automatic I/Q adjustment</p> <p>The switch offers the following options:</p> <ul style="list-style-type: none"> <li>– Start: starts the automatic I/Q adjustment. The calculation takes approx. 1 minute. During this time (display Calc), the RF output signal is suppressed.</li> <li>– Break: immediately stops the adjustment. The modulator must then be adjusted again in any case.</li> </ul> <p><b>Important:</b> Before performing the I/Q adjustment, make sure that the exciter has been in operation for at least 30 minutes. During adjustment, transmitter parameters must not be changed.</p> <p>The values for the actuators Bias Coarse, Bias Fine, Gain and Phase determined during automatic I/Q adjustment are displayed under the setting items of the same name for manual adjustment.</p> <p><i>The values are valid only for the intermediate frequency displayed under LO1 Frequency and can, if required, be checked and optimized with a manual I/Q adjustment (see section "Adjustment of I/Q modulator").</i></p>
I/Q Test Signal	Switches a test signal on or off to manually perform the I/Q adjustment.
Bias Coarse [I/Q]	For coarse setting and display of an actuator for suppressing the undesired center carrier; setting range: -1023 to +1023
Bias Fine [I/Q]	For fine setting and display of an actuator for suppressing the undesired center carrier; setting range: -32767 to + 32767
Gain [I/Q]	For setting and display of an actuator for suppressing the undesired carrier in the sideband; setting range: 0 to 255
Phase	For setting and display of an actuator for suppressing the undesired carrier in the sideband; setting range: -14 to +14

Display	Explanation
Auto I/Q Adjust	<p>Status display of automatic I/Q adjustment:</p> <ul style="list-style-type: none"> <li>– In Progress: an adjustment has been started; the calculation is currently being performed.</li> <li>– Adjusted: After completion of the adjustment, the display changes from "In Progress" to "Adjusted". This status is valid until a new and automatic I/Q adjustment is carried out. The "Adjusted" display does not necessarily mean that the modulator is (currently still) adjusted.</li> <li>– Not Adjusted: An error has occurred during the last adjustment. The automatic I/Q adjustment has to be repeated. If the automatic I/Q adjustment is still not functioning after several attempts, contact technical support.</li> </ul>
LO1 Frequency	<p>Display of the intermediate frequency LO1 which is automatically set in the modulator (1.92 GHz or 2.16 GHz)</p> <p><i>The adjustment values of the above actuators are only valid for the displayed intermediate frequency.</i></p>

### 3.8.4 RF > Limiter

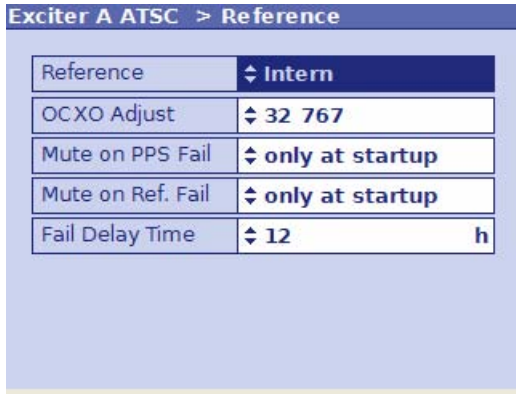


Setting item/display	Explanation
<b>Main Limiter</b>	The main limiter suppresses signal peaks across the entire output spectrum of the exciter.
State	Used to activate (Enable) or deactivate (Disable) the Main Limiter  Status display: Active/Off
Level	Used to set an operating point for the main limiter  <i>If 100% is set, the limiter is deactivated (like State = Off). If 0% is set, the useful signal is suppressed completely. This leads to RF Fail. Typical setting: 50%</i>

## 3.9 Reference Menu

A reference source for stabilization of the frequency processing (reference frequency source) can be selected via the **Reference** menu window.

In addition, the behavior of the exciter can be set for frequency processing if the reference source fails.



Setting item	Explanation
Reference	<p>Selects the reference frequency source. The following settings are possible:</p> <ul style="list-style-type: none"> <li>– Internal: operation without external reference frequency source</li> <li>– External 5 MHz: operation with external 5 MHz reference on</li> <li>– External 10 MHz: Operation with an external 10 MHz reference</li> <li>– External 1pps: Operation with an external time reference (1 pps)</li> </ul> <p><i>The same setting options are available in menu window RF &gt; Synthesizer.</i></p>
OCXO Adjust	<p>Setting for adjusting an internal OCXO frequency (for operating mode "Internal")</p> <p><i>The same setting options are available in menu window RF &gt; Synthesizer.</i></p>
Mute on PPS Fail	<p>For setting the behavior in SFN mode in the event of failure of the external time reference. The following settings are possible:</p> <ul style="list-style-type: none"> <li>– off: The output signal is not suppressed.</li> <li>– only at startup: the output signal is suppressed at startup until a valid 1 pps signal is recognized; if the 1 pps signal fails after successful synchronization, the output signal is no longer suppressed.</li> <li>– after fail delay time: The output signal is suppressed if the 1-pps signal fails for longer than the period specified at Fail Delay Time. This is the recommended setting for operation in SFN mode.</li> </ul>
Mute on Ref. Fail	<p>For setting the behavior in SFN and MFN mode in the event of failure of the external reference frequency source. The following settings are possible:</p> <ul style="list-style-type: none"> <li>– off: The output signal is not suppressed.</li> <li>– only at startup: the output signal is suppressed at startup until a valid reference source is detected; if the reference source fails after a successful synchronization, the output signal is no longer suppressed</li> <li>– after fail delay time: The output signal is suppressed if the reference source fails for longer than the period specified at Fail Delay Time. This is the recommended setting for operation in SFN mode.</li> </ul>

Setting item	Explanation
Fail Delay Time	<p>If a reference source fails, it takes the time given here before the output signal is suppressed. The setting is only effective if the behavior after fail delay time is set under Mute on PPS Fail or Mute on Ref. Fail.</p> <p>Selection: 0 to 24 hours; 0 hours = no delay time</p>

### 3.10 Device Info Menu

The menu windows under Device Info contain the electronic type plates for the exciter as a whole as well as for the individual modules or elements in the exciter:

- Exciter (complete device)
- Boards (modules)
  - Mainboard
  - Input interface
  - RF board
  - Synth 1 (only with device variants 60 and 61)
  - Synth 2 (only with device variants 60 and 61)
  - Synth 3 (only with device variant 61)

The structure of the individual type plates is more or less identical. The information which is displayed is explained below using the exciter type plate as an example:

#### Device Info > Exciter

Exciter A ATSC > Device Info > Exciter	
Part Number	2095.1502
Variant	61
Product index	00.00
Serial Number	100001
Product Date	2006-01-03
Software Number	2095.2973
Software Version	1.5.5
Operating hours	1200
Power up cycles	7

Display	Description
Part Number	Part number
Variant	Device or module variant (model)
Product Index	Product modification index

<b>Display</b>	<b>Description</b>
Serial Number	Serial number
Product Date	Date of production
Software Number	Part number for the software
Software Version	Version number for the software
Operating hours	Number of operating hours
Power up cycles	Number of times device has been switched on/off

The information saved here is used for troubleshooting purposes. In case servicing is required, this information allows you to precisely identify the defective component and order a replacement.

## **4 Adjustment of I/Q Modulator**

**Note** *Before performing the adjustment, make sure that the exciter has been in operation for at least 30 minutes.*

### **Objective**

If quadrature modulation were optimal (theoretically possible), the residual carrier would be completely suppressed. In actual practice, however, residual carriers arise (e.g. due to crosstalk). They must be suppressed using suitable correction carriers.

The objective of I/Q adjustment is to suppress the undesired center carrier and undesired carrier in the sideband with respect to a test carrier by better than 60 dB.

### **Two methods are available**

Two methods are available to perform the I/Q adjustment: setting and testing actuators manually or via a convenient automatic process.

The automatic method will usually meet the requirements. Yet, it may sometimes be useful to test the automatically determined values for the actuators and to improve them.

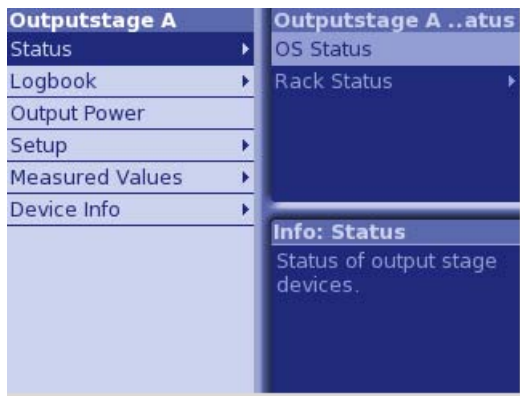
**Note** *How to perform I/Q adjustment is described in the chapter "Maintenance" of your exciter manual.*

# 5 Menus of Outputstage A/B

You can use the Outputstage A/B menus to operate and configure the transmitter rack and the amplifier and to call up information.

*Note* The Outputstage B menus and menu windows are identical to the Outputstage A menus and menu windows.

## 5.1 Overview of Menus



Outputstage A menu structure			
Level 1	Level 2	Level 3	Level 4
Status			
	OS Status		
	Rack Status		
		Rack 1	
			Rack Controller
			Amplifier 1 to 4
Logbook			
	Summary		
	Status		
	Warning		
	Fault		



Outputstage A menu structure			
Level 1	Level 2	Level 3	Level 4
Output Power			
Setup			
	OS Setup		
	Rack Setup		
		Rack Order	
		Rack 1	
			Rack Controller
			Amplifier Order
Measured Values			
	Rack Measured Values		
		Rack 1	
			Rack Controller
			Amplifier 1 to 4
Device Info			
	Rack 1		
		Rack Controller	
		Amplifier 1 to 4	

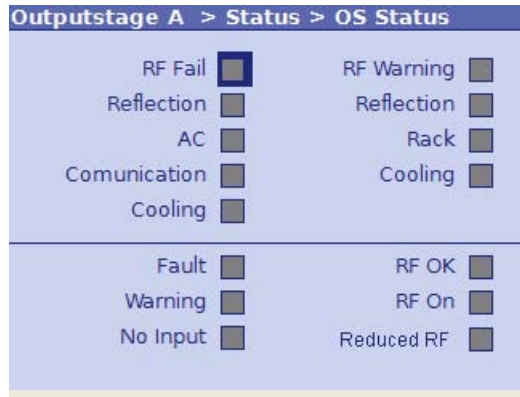
## 5.2 Status Menu

The **Status** menu provides an overview of faults, warnings and status messages relating to the individual output stage components.

## 5.2.1 OS Status Menu Window

### Outputstage A > Status > OS Status

The **OS Status** menu window provides an overview of faults, warnings and status messages relating to the output stage components.



The following table explains the meaning of the individual display fields:

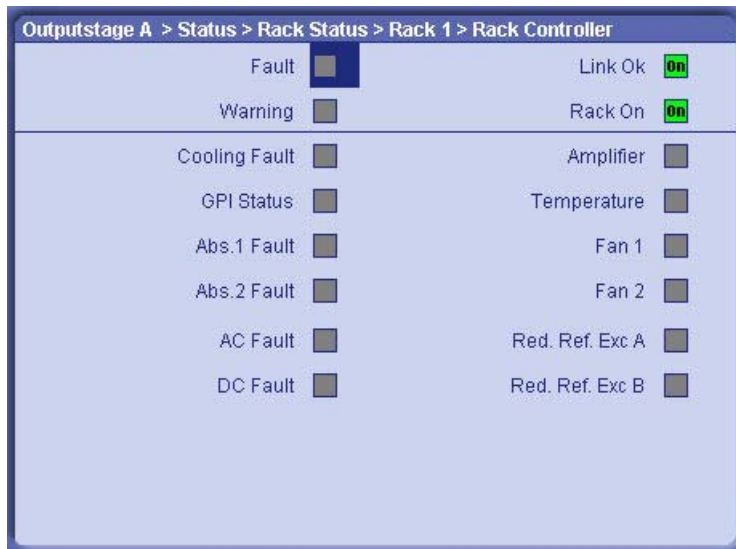
Display	Explanation
RF Fail	Red: Antenna output power is below the set fault threshold
Reflection	Red: Antenna reflected power is above the set fault threshold
AC	Red: AC supply voltage fault (e.g. phase absent)
Communication	Red: Communication to the output stage has been interrupted
Cooling	Red: Cooling system fault  Possible causes: both fans have failed
Fault	Red: Output stage sum fault
Warning	Yellow: Output stage sum warning
No Input	Yellow: No input signal sent to the amplifiers
RF Warning	Yellow: Antenna output power is below the set warning threshold
Reflection	Yellow: Antenna reflected power is above the set warning threshold
Rack	Yellow: There is a fault at at least one transmitter rack
Cooling	Yellow: There is a fault in the cooling system

Display	Explanation
RF OK	Green: Antenna output power is above the set warning limit
RF On	Green: Antenna output power is above the set fault threshold
Reduced RF	Yellow: Reduced RF power (only applies to ATV)

## 5.2.2 Status/Rack Controller Menu Window

**Outputstage A > Status > Rack Status > Rack x > Rack Controller**

The **Status/Rack Controller** menu window provides status information about the rack controller.



The following table explains the meaning of the individual display fields:

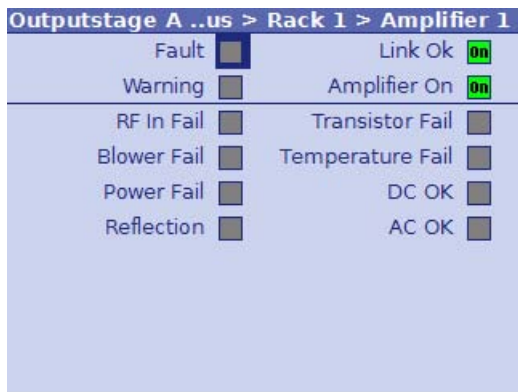
Display	Explanation
Fault	Red: Transmitter rack sum fault
Warning	Yellow: Transmitter rack sum warning
Link Ok	Green: There is a communication link with the transmitter rack
Rack On	Green: ON command at the rack is active
Cooling Fault	Red: Cooling system sum fault
GPI Status	GPI stands for <i>General Purpose Input</i> . Displays the status of a user-configurable pin at the rack controller.
Abs. 1 Fault	Red: Fault at absorber 1

Display	Explanation
Abs. 2 Fault	Red: Fault at absorber 2
AC Fault	Red: AC power supply fault (e.g. phase absent)
DC Fault	Red: Fault at auxiliary power supply unit
Amplifier	Yellow: Amplifier sum fault (at least one amplifier is indicating a fault)
Temperature	Red: Exhaust air temperature is above the set fault threshold
Fan 1	Yellow: Fault at fan 1
Fan 2	Yellow: Fault at fan 2
Red.Ref.Exc.A	Only applies to ATV
Red.Ref.Exc.B	Only applies to ATV

### 5.2.3 Status/Amplifier x Menu Window

**Outputstage A > Status > Rack Status > Rack x > Amplifier**

The **Status/Amplifier** menu window provides status information about the amplifiers.



The following table explains the meaning of the individual display fields:

Display	Explanation
Fault	Red: Amplifier x sum fault
Warning	Yellow: Amplifier x sum warning
Link OK	Green: There is a communication link to amplifier x
Amplifier ON	Green: Amplifier ON

Display	Explanation
RF In Fail	Yellow: No RF input signal at the amplifier
Blower Fail	Not active for this amplifier type
Power Fail	Red: Forward power is below the fault threshold
Reflection	Red: Reflected power at the amplifier VSWR >1.6
Transistor Fail	Red: At least one transistor of the amplifier is faulty
Temperature Fail	Red: Heat sink temperature > 85 °C ± 4 K
DC OK	Green: Internal DC power supply is OK
AC OK	Green: External AC power supply is OK

## 5.3 Logbook Menu

You can use the **Logbook** menu to query status and error messages about the output stage.

### 5.3.1 Logbook Menu Window

#### Outputstage A > Logbook

You can use the **Logbook** menu to query status and fault messages about the output stage. The Logbook menu windows provide an overview of status messages, warning messages and fault messages about the output stage.

*Note* You can call up logbook entries in the **Summary**, **Status**, **Warning** and **Fault** windows.



Outputstage A > Logbook > Summary			
No.	Message	Date	Time
2	↑ RF Ok	09-06-23	15:45:38
1	↑ RF On	09-06-23	15:45:36

The following table explains the meaning of the columns:

Column	Explanation
No	Consecutive entry number
Message	Message
Time	Time at which the message was received
Date	Date on which the message was received

The arrows in the second column have the following meaning:

Arrow direction	Arrow color	Explanation
Up		The event has just occurred.
Down		The event is no longer current or relevant.
	Red	Fault
	Yellow	Warning
	Green	Status

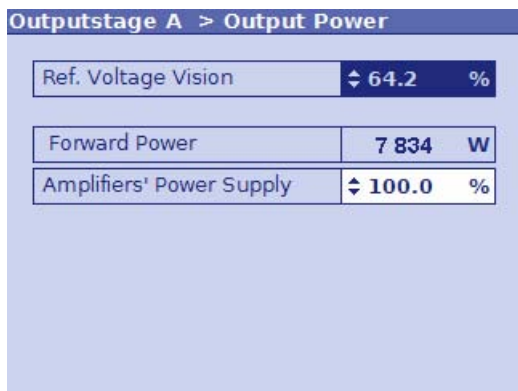
## 5.4 Output Power Menu

You may use the **Output Power** menu to access the **Output Power** window.

### 5.4.1 Output Power Menu Window

**Outputstage A > Output Power**

In the **Output Power** menu window you can set the output power of the transmitter.



The following table explains the meaning of the individual settings:

Setting/display	Explanation
Ref. Voltage Vision	Used to set the transmitter output power Value: 0% to 100%
Forward Power	Current reading of the transmitter-internal power display  <i>The displayed value is only valid after the transmitter power has been entered under the parameter "Nominal Value" and the power display has been calibrated.</i>
Amplifiers' Power Supply	DC supply voltage of the amplifier Value: 31% to 100%  100% corresponds to a nominal DC supply of 32 V. 31% corresponds to a nominal DC supply of 12 V.  The efficiency can be improved by reducing the DC supply voltage.  <i>Large changes in the DC supply voltage are only permitted if the amplifier is operated below the nominal power.</i> <b>Caution: Current limiting</b>

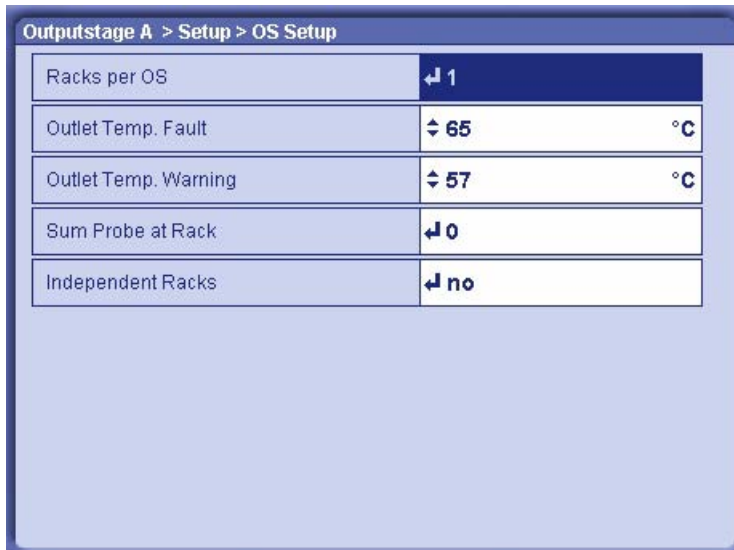
## 5.5 Setup Menu

You may use the **Setup** menu to access the **OS Setup** window.

### 5.5.1 OS Setup Menu Window

**Outputstage A > Setup > OS Setup**

In the **OS Setup** menu window you can make basic settings for the output stage.



The following table explains the meaning of the individual settings:

Setting	Explanation
Racks per OS	Number of racks belonging to the output stage
Outlet Temp. Fault	Switch-off threshold with overtemperature If this threshold is exceeded, the rack controller shuts down the transmitter rack. Value: 45 °C to 65 °C Nominal value: 65 °C
Outlet Temp. Warning	Warning threshold for overtemperature A warning is generated if this threshold value is exceeded.
Sum Probe at Rack	Used to select the transmitter rack (rack controller) to which the test points for forward/reflected power of the entire output stage are connected  <i>Only with active and passive output-stage standby</i>
Independent Racks	Possibility of dividing the output stage logically into independent racks – no: All racks of the output stage are controlled together and all act on the same RF output (default setting). – yes: The racks of the output stage can have separate RF outputs and can be controlled individually (e.g. ON/OFF command).

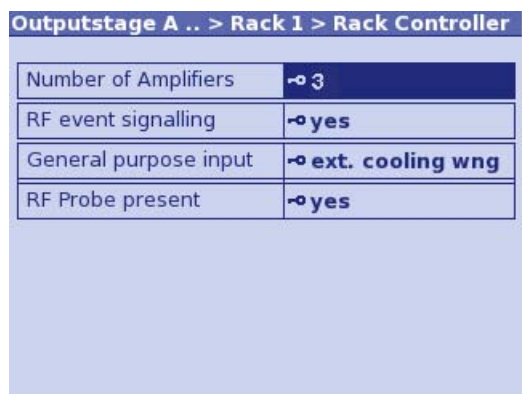
### 5.5.2 Rack Setup > Rack Order Menu Window

**Note** *This menu window is not relevant for single-rack transmitters.*



### 5.5.3 Rack Setup > Rack x > Rack Controller Menu Window

The **Rack Controller** menu window is used to inform the rack controller, for example, how many amplifiers are installed in the rack and whether the rack has its own measurement system.



Setting	Explanation
Number of Amplifiers	Used to enter the number of amplifiers installed in the rack Value: 1 to 4
RF event signalling	<ul style="list-style-type: none"> <li>– yes: If the minimum or maximum limits for forward and reflected power (RF Fail Limit, RF Warning Limit) are violated at the test points of the rack, warnings or fault messages are output (default setting).</li> <li>– no: Output of RF warnings and fault messages at the test points of the rack is suppressed.</li> </ul>
General purpose input	Assignment of a free line on the rack controller for customer-specific purposes: <ul style="list-style-type: none"> <li>– unused: Line is not used.</li> <li>– door open: Line is reserved for indicating when door contacts are open.</li> <li>– ext. cooling wng: Line is reserved for warnings from an external cooling system.</li> <li>– ext. cooling flt: Line is reserved for fault messages from an external cooling system.</li> </ul>
RFProbe present	<ul style="list-style-type: none"> <li>– yes: A measurement system is connected to the rack controller of the rack. <i>Only with active or passive output-stage standby if the measurement system is connected to this rack.</i></li> <li>– no: No measurement system is connected to the rack controller of the rack. <i>Correct setting in all other cases.</i></li> </ul>

### 5.5.4 Rack Setup > Rack x > Amplifier Order Menu Window

After the transmitter system has been put into operation, entries for the amplifiers (of a particular rack) are displayed in the menu path for the output stage with consecutive numbering (**Amplifier 1** to max. **Amplifier 4**). Since the numbering is derived from the chronological sequence in which the amplifiers can be detected on the CAN bus, it does not always correspond to the sequence in which the amplifiers are physically arranged from top (= 1) to bottom (= n) in the rack.

The **Amplifier Order** menu window is used to change the menu items for the amplifiers with respect to the installation positions in the rack.

Outputstage A .. Rack 1 > Amplifier Order			
Device	Link	Serialnumber	Identify
↕ 1	on	900003	↕ Start
↕ 2	on	900006	↕ Start
↕ 3	on	900004	↕ Start
↕ 4	on	900009	↕ Start
↕ 5	on	900012	↕ Start
↕ 6	on	900002	↕ Start
↕ 7			↕ Start
↕ 8			↕ Start
↕ 9			↕ Start
↕ 10			↕ Start

Setting/display	Explanation
Device	Order number x (= 1 to n) of an amplifier; this number describes the position of the associated amplifier menu in the menu path  By setting the order numbers correctly, it is possible to synchronize the menu items (1 to n) and the associated installation positions (from top to bottom).
Link	Green: Amplifier is installed in the rack
Serial number	Serial number of the amplifier (as indicated on the electronic type plate)
Identify	Identification of an amplifier in the rack  If the Start switch is activated, the LEDs of the associated amplifier in the rack flash.

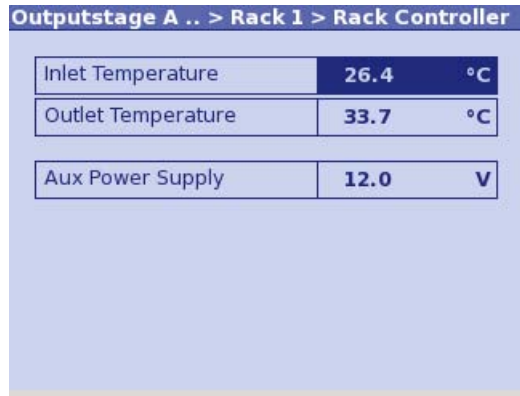
## 5.6 Measured Values Menu

You can use the **Measured Values** menu to read off measurement values.

### 5.6.1 Measured Values/Rack Controller Menu Window

**Outputstage A > Measured Values > Rack Measured Values > Rack x > Rack Controller**

The **Measured Values/Rack Controller** menu window displays the intake and exhaust air temperatures and the control voltage of the transmitter rack.



The following table explains the meaning of the fields:

Display	Explanation
Inlet Temperature	Inlet temperature of the cooling medium (intake air)
Outlet Temperature	Outlet temperature of the cooling medium (exhaust air)
Aux Power Supply	Control voltage of the internal auxiliary power supply for the transmitter rack  The value must be approx. 12 V.

### 5.6.2 Measured Values/Amplifier x Menu Window

**Outputstage A > Measured Values > Rack Measured Values > Rack x > Amplifier x**

The **Measured Values/Amplifier x** menu window displays the measurement values for a selected amplifier.

Outputstage A ..es > Rack 1 > Amplifier 1					
I[1A]	0.00	A	U[DC]	0.00	V
I[2A]	0.00	A	I[DC]	0.00	A
I[3A]	0.00	A	U[DC_Ctrl]	0.00	V
I[4A]	0.00	A	U[REG]	0.00	V
I[1B]	0.00	A	PWR[A]	0.00	V
I[2B]	0.00	A	PWR[B]	0.00	V
I[3B]	0.00	A	PWR[Out]	0.00	V
I[4B]	0.00	A	PWR[Ref]	0.00	V
I[Drv]	0.00	A	PWR[Ref]	0.00	V

The following table explains the meaning of the fields:

Display	Explanation
I[xA]	Module current of an output stage module, x = 1 to 4 <sup>a)</sup>
I[xB]	Module current of an output stage module, x = 1 to 4 <sup>a) b) c)</sup>
I[Drv]	Current of the driver stage
U[DC]	Supply voltage of the amplifier
I[DC]	Total DC current
U[DC_CTRL]	Reference voltage of the amplifier
U[REG]	AGC voltage of the amplifier
PWR[A]	Detector voltage of the power detector DET_A
PWR[B]	Detector voltage of the power detector DED_B
PWR[Out]	Forward voltage of the output-power detector
PWR[Ref]	Reflected voltage of the reflected-power detector
PWR[Ref]	Reference voltage of the output-power detector

- a) With the amplifier type R&S VH8300A1, the measured current values I[4A] and I[1B] to I[4B] are not displayed.
- b) With the amplifier type R&S VH8200A1, the measured current values I[1B] and I[4B] are not displayed.
- c) With the amplifier type R&S VM8530A1, the measured current values I[3B] and I[4B] are not displayed. The displayed measurement values correspond to the individual transistor currents.

## 5.7 Device Info Menu

You can use the **Device Info** menu to call for information on the transmitter rack.

## 5.7.1 Device Info/Rack Controller Menu Window

**Outputstage A > Device Info > Rack x > Rack Controller**

You can use the **Device Info/Rack Controller** menu to call for information on the transmitter rack.

Outputstage A .. > Rack 1 > Rack Controller	
Part Number	2096.4505
Variant	02
Product index	04.01
Serial Number	100337
Product Date	2006-11-02
SW/FW/BIOS Number	2096.4611
SW/FW/BIOS Version	01.44

The following table explains the meaning of the display fields:

Display	Description
Part Number	R&S stock number
Variant	Model (basic model = 02)
Product Index	Hardware amendment index
Serial Number	Serial number
Product Date	Date of production
SW/FW/BIOS Number	R&S stock number for software, firmware or BIOS
SW/FW/BIOS Version	Version number of software, firmware or BIOS

## 5.7.2 Device Info/Amplifier x Menu Window

**Outputstage A > Device Info > Rack x > Amplifier x**

The **Device Info/Amplifier x** menu window provides device information for an amplifier.

Outputstage A ..fo > Rack 1 > Amplifier 1	
Part Number	0000.0000
Variant	00
Product index	00.00
Serial Number	000000
Product Date	2004-12-24
SW/FW/BIOS Number	0000.0000
SW/FW/BIOS Version	0.0.0

The following table explains the meaning of the display fields:

Display	Explanation
Part Number	R&S stock number
Variant	Model (basic model = 02)
Product index	Hardware change index
Serial Number	Serial number
Product Date	Date of production
SW/FW/BIOS Number	R&S stock number for software, firmware or BIOS
SW/FW/BIOS Version	Version number of software, firmware or BIOS

## 6 Other Menus

### 6.1 TxTool Menu: Saving Transmitter Information

In order to improve clarity and for archiving purposes, you can save transmitter data selected via the web browser (such as logbook or device information, measurement values or parameters) to an ASCII or HTML file. You can also delete and restore logbook entries of the transmitter components.

1. Select **TxTool** in the browser window.

A security query appears first of all.

**Note** Execution of the TxTool requires write rights to the file system of the computer. To grant these rights you must confirm the security query.

If you select **Always trust content from this author**, the security query will not be displayed the next time the TxTool is called.



2. Confirm the security query with **Run**.

The **TxTool** window used to display and save transmitter data appears.

No.	Slope	Type	Message	Date	Time	Offset	Counts	Source
188	Set	State	Local	24.04.2009	13:25:05	+02:00	1	CCU
187	Reset	Warning	Ost A Warning	24.04.2009	13:19:36	+02:00	1	CCU
186	Set	Fault	No connect Ost A	24.04.2009	13:19:36	+02:00	1	CCU
185	Set	State	Active Ost A	24.04.2009	13:19:02	+02:00	1	CCU
184	Set	State	Active Exc A	24.04.2009	13:19:02	+02:00	1	CCU
183	Set	State	RF On	24.04.2009	13:19:02	+02:00	1	CCU
182	Set	Warning	Ost A Warning	24.04.2009	13:19:02	+02:00	1	CCU
181	Set	Warning	Fan	24.04.2009	13:19:02	+02:00	1	CCU
180	Set	Fault	No connect Exc B	24.04.2009	13:19:02	+02:00	1	CCU
179	Set	Fault	No connect Exc A	24.04.2009	13:19:02	+02:00	1	CCU
178	Set	Fault	Exc Switch	24.04.2009	13:19:02	+02:00	1	CCU
177	Set	State	Reboot	24.04.2009	13:18:39	+02:00	1	CCU
176	Reset	Warning	Ost A Warning	11.04.2009	17:39:49	+02:00	1	CCU
175	Set	Fault	No connect Ost A	11.04.2009	17:39:49	+02:00	1	CCU
174	Set	State	Active Ost A	11.04.2009	17:39:17	+02:00	1	CCU
173	Set	State	Active Exc A	11.04.2009	17:39:17	+02:00	1	CCU
172	Set	State	RF On	11.04.2009	17:39:17	+02:00	1	CCU
171	Set	Warning	Ost A Warning	11.04.2009	17:39:17	+02:00	1	CCU
170	Set	Warning	Fan	11.04.2009	17:39:17	+02:00	1	CCU

The window is initially empty when opened. The required settings must be selected before the data is read out.

### Reading out data

1. Select (top left) the data that is to be displayed.

Different windows containing additional functions are displayed depending on the type of data you select. Depending on the selected tab, the window will still be empty (e.g. **LogBooks**) or the appropriate data will be displayed (e.g. **DeviceInfo**).

2. Select (depending on the window) which data is to be displayed (see the table under "Functions in Logbooks Window").
3. Start the readout of the data with **Read**.

### Saving data

Different options and formats are available for saving the data.

1. Under **Output Format**, select the file format in which the data is to be saved.
2. In the **Output** menu, select whether the data is to be saved as a file (**Write to File**) or copied to the clipboard (**Copy to Clipboard**).

Depending on your selection, you can save the data in a file using the Windows **Save** command or copy it to the clipboard and then use it in other applications.

**Note**

*If the data is to be evaluated in a spreadsheet application (e.g. Microsoft Excel) it is advisable to copy the data to the clipboard in HTML format. If the clipboard is then copied to an (empty) worksheet, the values are separated in tabular form.*

## 6.1.1 Functions in LogBooks Window

The following additional functions are available in the **Logbooks** window:

Function	Explanation
Message Type	Used to select the type of messages which are to be listed (more than one option can be selected)
Device	Used to select the transmitter components for which message data is to be displayed (more than one option can be selected)
Content Type Filter	Used to select the parameters or values which are to be displayed
Display	Used to show and hide the columns Counts (shows the number of messages of this message type) and Source (shows the transmitter component to which the message is assigned)
Last/First On Top	Sorts the displayed messages according to the time at which they occurred
Clear	(Real) deletion of the logbook entries (identical to deleting the logbook entries using the context menu of the Logbook menu window)



Function	Explanation
Restore	(Real) restoration of the logbook entries (identical to restoring the logbook entries using the context menu of the Logbook menu window)
Read	Used to read out / update the displayed messages

## 6.2 SW Backup/Restore Menu: Backing Up Complete System

You can create a data/system backup file on the flash card of the R&S NetCCU800 and save it on an external medium or restore it to the flash card by using the **SW Backup/Restore** browser menu.

**Note** You can create the data/system backup file in the **SW Backup/Restore** menu window of the R&S NetCCU800 and from there also read it directly back into the R&S NetCCU800.

☞ Select **Backup / Restore** in the browser window.

The **SW Backup/Restore - Web Interface** window is displayed.



Commands	
Upload	<input type="text"/> <input type="button" value="Durchsuchen..."/>
	<input type="button" value="Upload selected file to the Device"/>
Download	<input type="button" value="Download Backup file from Device"/>
Status	
Status	Ready
Backup Information	
File Status	Backup OK
Device	NetCCU800
Part Number	2095.8007k02
SerialNumber	100116
Date	2009-04-08
Time	12:24:39
SW Version	1.16.5-2
Tx Name	NX8000

The window displays the current status of the tool (Status) as well as the backup information (**Backup Information**) related to the data/system backup file that is stored on the flash card.

**Copy the data/system backup file from the flash card to an external medium**

1. Click on **Download Backup file from the Device**.

2. In the Windows dialog boxes that follow, select the desired file name and where you want to save it.

The file will be saved at the selected location.

#### **Copy the data/system backup file from an external medium to the flash card**

1. Click on **Browse**.
2. Select the desired file in the Windows dialog boxes that follow.  
The selected file is shown in the display area of the **Upload** window segment.

3. Click **Upload selected file to the Device**.

The file is saved on the R&S NetCCU800 flash card and can then be loaded into the R&S NetCCU800 via the **SW Backup/Restore** menu window.

## **6.3 Storage Menu: Saving Exciter Data**

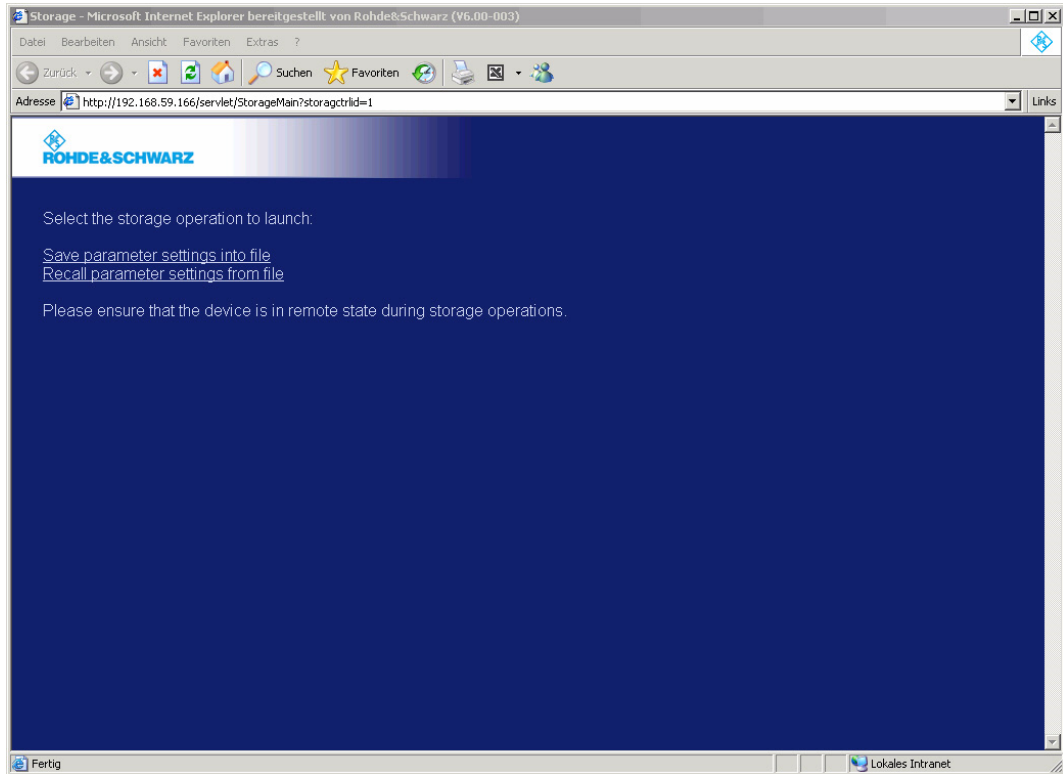
You can use the R&S NetCCU800 to save parameter data of the exciter to an external medium and to recall this data again when required.

**Note** *This function is only available via the web browser.*

The exciter must be connected to the R&S NetCCU800 and must be in remote mode.

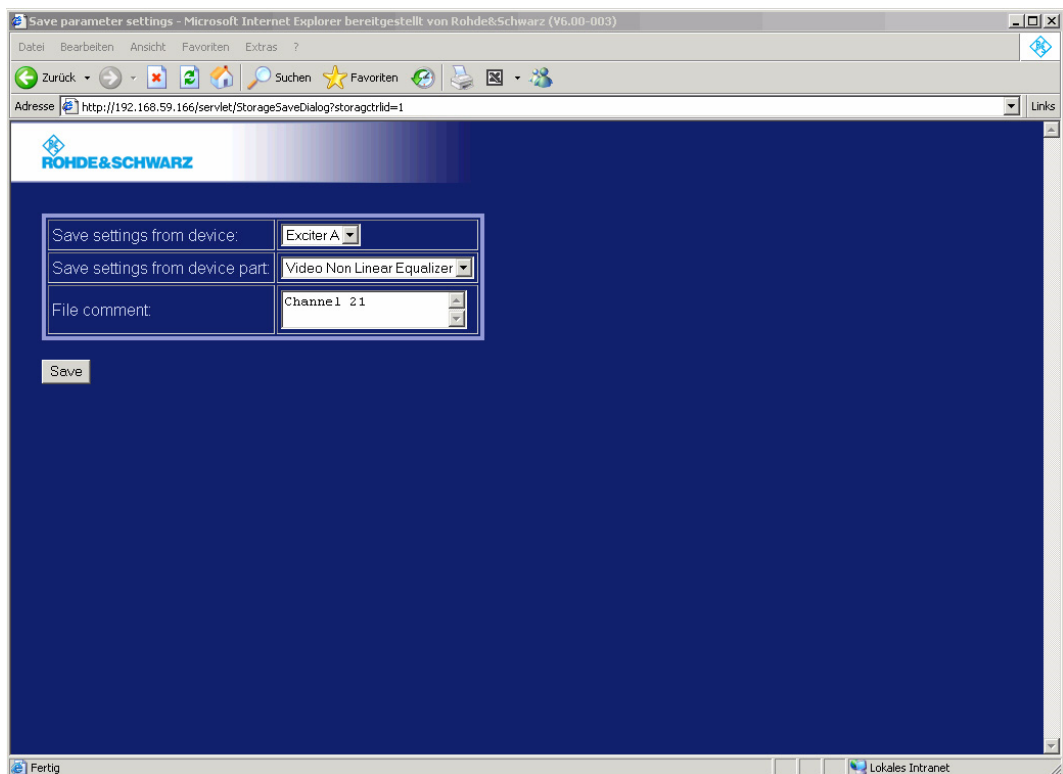
- ☞ Select **Storage** in the browser window.

The start window to save and recall exciter parameter data is displayed.



### 6.3.1 Saving Parameter Data

1. In the start window, select **Save parameter settings into file**.  
A window opens from which you can select the parameter data you want to save.



2. Select the required exciter and the parameter data set that you want to save.
3. Enter a unique comment about the selected parameter set to help you recognize the content of the set or its intended use.
4. Click **Save**.

Use the Windows **Save file as** command to save the parameter set to a file.

### 6.3.2 Recalling Parameter Data



#### ATTENTION!

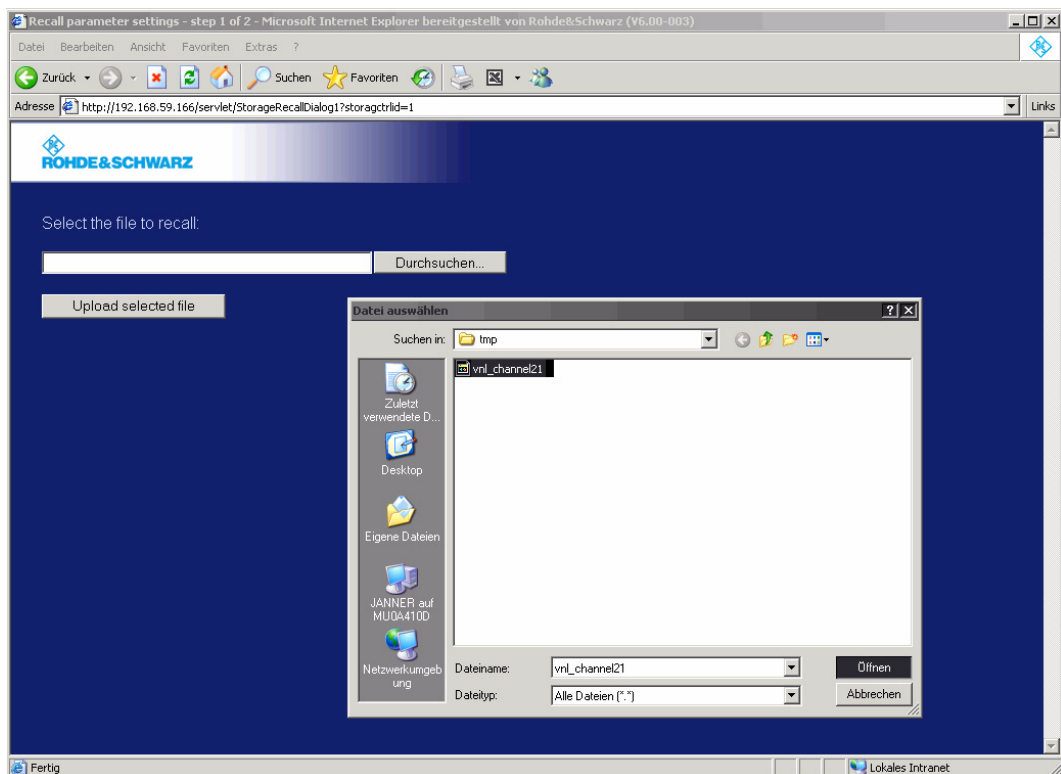
When parameter data is recalled, the current parameters of the selected exciter are overwritten without a warning message being displayed.

1. In the start window, select **Recall parameter settings into file**.

A window appears in which you can select which saved parameter data you want to recall to which exciter.

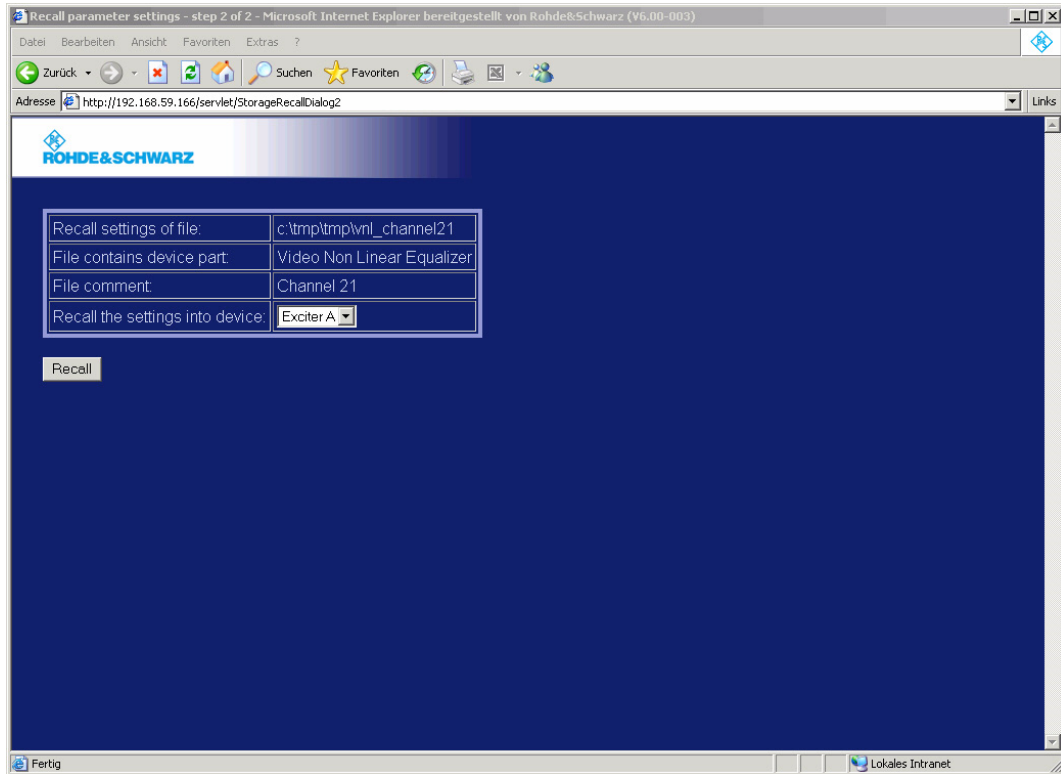
#### Note

*It is possible to import the parameter data of an exciter to a second exciter of the same type.*



2. Click **Browse** and select the required file.
3. Click **Upload selected file** to load the file.

A window is opened in which you can select the exciter to which the parameter data is to be copied.



4. Select the exciter to which the parameter data is to be copied, and confirm with **Recall**.  
The parameter data is copied to the selected exciter. The exciter is then automatically rebooted.

