

# Release Notes

Revision: 02

## R&S® FSC Spectrum Analyzer

### Firmware Release 2.20

These Release Notes describe the following models and options of the R&S® FSC Spectrum Analyzer:

- R&S® Spectrum Analyzer FSC3, order no. 1314.3006.x3
- R&S® Spectrum Analyzer FSC6, order no. 1314.3006.x6

#### New features in V2.20:

- Spectrum Analyzer: Trace color changes on limit line violation
- Spectrum Analyzer: Faster sweep time with narrow resolution bandwidth due to use of FFT filters
- Network Analyzer: Trace mathematics available
- Network Analyzer: Limit lines added, including pass / fail display
- Limit lines: Horizontal threshold line available in addition to limit lines loaded from file
- Support of power sensors R&S®NRP-Z211 and R&S®NRP-Z221
- SCPI command to create limit lines
- Remote Control: Shutdown command added
- Configurable screenshot button for immediate storing of datasets or pictures
- Default name for saving datasets can be changed by user
- Beep on fail and overload
- Support for different time zones. This new function should be used to adapt time and date to the local geographic conditions.
- A file rename function was added to the file manager.
- Trace from recalled setup file is automatically stored in memory trace

#### New features in FSCView Software Version V2.20

- Synchronization button for easy exchange of settings and result files between PC and instrument
- Remote Instrument Desktop available
- Report Generator for stored measurement results (datasets) available

#### Important notes:

- Please refer to sections 6.2.2 and 6.2.3 before updating instruments from firmware version 1.30 or below.
- The USB stick used to update the firmware needs to be formatted either in FAT16 or FAT32 format.
- Instruments shipped with V1.21 or higher cannot be downgraded to firmware versions below V1.21, as older firmware versions do not support the flash memory type used in newer instruments.

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# 1 New Functions

The following table lists the new functions in V2.20:

Version	Function
V2.20	Spectrum Analyzer: Trace color changes on limit line violation
V2.20	Spectrum Analyzer: Faster sweep time with narrow resolution bandwidth due to use of FFT filters
V2.20	Network Analyzer: Trace mathematics available
V2.20	Network Analyzer: Limit lines added, including pass / fail display
V2.20	Limit lines: Horizontal threshold line available in addition to limit lines loaded from file
V2.20	Support of new power sensors R&S®NRP-Z211 and R&S®NRP-Z221
V2.20	SCPI command to create limit lines
V2.20	Remote Control: Shutdown command added
V2.20	Configurable screenshot button for immediate storing of datasets or pictures
V2.20	Default name for saving datasets can be changed by user
V2.20	Beep on fail and overload
V2.20	Support for different time zones. This new function should be used to adapt time and date to the local geographic conditions.
V2.20	A file rename function was added to the file manager.
V2.20	Trace from recalled setup file is automatically stored in memory trace
V2.20	FSCView: Synchronization button for easy exchange of settings and result files between PC and instrument
V2.20	FSCView: Remote Instrument Desktop available
V2.20	FSCView: Report Generator for stored measurement results (datasets) available

The following table lists modifications, which were introduced in earlier versions, and indicates the version in which the modification was introduced:

Version	Function
V1.30	Spectrum Analyzer: Display and measurement of two traces with different trace mode or detector settings in one display
V1.30	Spectrum Analyzer: Display of PASS/ FAIL information in ACLR measurement
V1.30	Spectrum Analyzer: LTE standard configurations now support ACLR limits for LTE and WCDMA adjacent channels
V1.30	Network Analyzer: Selectable uplink and downlink frequency channel tables
V1.22	Spectrum Analyzer: Minimum value for Reference Level is -200 dBm
V1.22	Network Analyzer: Minimum value for Reference is -200 dB
V1.22	Spectrum Analyzer: LTE standard configurations now support ACLR limits for LTE and WCDMA adjacent channels
V1.21	Remote Control: Remote command SYST:SHUT added for instrument shutdown
V1.20	Power Meter: New measurement mode Power Meter
V1.20	Power Meter: Support of R&S@NRP-Z11, R&S@NRP-Z21, R&S@NRP-Z22, R&S@NRP-Z23, R&S@NRP-Z24, R&S@NRP-Z31, R&S@NRP-Z51, R&S@NRP-Z55, R&S@NRP-Z56, R&S@NRP-Z57, R&S@NRP-Z81, R&S@NRP-Z91, R&S@NRP-Z92.
V1.20	Network Analyzer: Support for Limit Lines with unit dB
V1.20	Screen Capture supports JPG and PNG format
V1.20	LAN gateway settings for LAN connections with firewall
V1.20	Support of user defined preset dataset
V1.20	Remote Control: Support of Gated Trigger
V1.10	Spectrum Analyzer: ACLR measurements
V1.10	Spectrum Analyzer: Spectrum Emission Mask measurements
V1.10	Spectrum Analyzer: Gated Trigger
V1.10	Spectrum Analyzer: Measurement of Harmonic Signals
V1.10	Spectrum Analyzer: AM Modulation Depth measurement
V1.10	Spectrum Analyzer: Display of frequency + channel number with active channel tables
V1.10	Indicator for presence of valid external reference signal
V1.10	Printer friendly color scheme
V1.10	Network Analyzer: Support of channel tables
V1.10	Remote control: Export of trace data in binary format
V1.10	Remote control: Support of HCOPY command

## 2 Modified Functions

The following table lists the functions modified in V2.20:

Version	Function
V2.20	Network Analyzer: The hardware setup was optimized to increase the margin before an overload condition is reported. This resulted in changes to the internal calibration data structures. As a consequence a self-alignment must be performed when updating older firmware versions to V2.20.
V2.20	Network Analyzer: Manual sweep time entry is enabled again
V2.20	When switching between operating modes (e.g. Spectrum Analyzer -> Network Analyzer), the display now shows the target operating mode while the switch is in progress.
V2.20	The Occupied Bandwidth measurement allows to set any desired span independently of the selected Channel Bandwidth
V2.20	User must now explicitly confirm when changing the date settings. Together with the new support for time zones this mechanism should help avoiding conflicts with timed option licenses.
V2.20	Remote Control: In manual operation the span is adjusted automatically when selecting narrow resolution bandwidths. Via remote control the resolution bandwidth command was rejected if the span settings didn't match. Starting with V2.20 the remote control behavior is equal to the behavior in manual operation.
V2.20	Optimized synthesizer setup table

The following table lists modifications, which were introduced in earlier versions, and indicates the version in which the modification was introduced:

Version	Function
V1.30	Spectrum Analyzer: Explicit display of IF Overload condition
V1.30	Optimized 1MHz resolution filter shape
V1.25	The modifications in V1.25 are for R&S® FSC manufacturing purposes only.
V1.23	Optimized synthesizer setup table
V1.22	New synthesizer setup table
V1.21	Hardware: V1.21 supports a new type of internal flash memory. Instruments shipped with V1.21 cannot be downgraded to earlier versions.
V1.21	Spectrum Analyzer: Update of the LTE standard files for spectrum emission mask
V1.20	Support of Channel Tables with overlapping frequency limits between channels
V1.20	The following predefined transducer factors were renamed from primary transducer factors to secondary transducer factors (= add on factors in unit dB): FSH-Z38 PreAmp RAM TSEMFZ2 example
V1.20	The limit lines GSM_UPPER.RELLIM and GSM_LOWER.RELLIM, which are positioned relative to the upper diagram border, were shifted down by 4 dB, so that their maximum level is displayed inside the diagram.
V1.10	More transducer and limit line points (1000)
V1.10	Spectrum Analyzer: Improved level adjust routine with active preamplifier
V1.10	Auto sweep time in Network Analyzer mode changed for RBW < 10 kHz and span < 300 MHz

## 3 Improvements

The following table lists the issues eliminated in V2.20:

Version	Function
V2.20	SCPI command for Detector Auto on Trace 2 didn't work
V2.20	Improved speed on marker frequency change with active Marker Demod function.
V2.20	Fixed a memory leak in Power Meter when using USB Power Sensor
V2.20	FSCView: File conversion stores the previously selected file type
V2.20	FSCView: Improved import of limit lines in .csv format if values contain digits behind the decimal point
V2.20	FSCView: Improved display of measurements with active transducer in unit V/m

The following table lists the issues already eliminated in earlier versions and indicates the version in which the issues were eliminated:

Version	Function
V1.30	Spectrum Analyzer: Improved level adjust routine for multicarrier signals
V1.30	Spectrum Analyzer: Delta Markers are displayed with values down to 1 Hz
V1.30	Spectrum Analyzer: Improved accuracy of marker frequency readout, obtained by modified auto sweep time calculation
V1.22	Spectrum Analyzer: Improved level adjust routine for multicarrier signals
V1.20	Remote control: The response for command TRACE:DATA? TRACE1 contains double quotes and a trailing comma
V1.20	When saving a dataset, the saved trace data and the preview screenshot capture different data
V1.20	Spectrum Analyzer: The trace contains black lines in the noise floor
V1.20	Several predefined transducer factors for HE300 and HE200 antenna contain frequency values in Hz rather than MHz
1.10	Network Analyzer: The accuracy with active normalization is limited to +- 1.5 dB
1.01	New synthesizer setup table

## 4 Known Issues

None.

## 5 Modifications to the Documentation

The latest manual can be downloaded from the R&S® FSC Spectrum Analyzer product web page under: <http://www.rohde-schwarz.com>. Select "DOWNLOADS" and "MANUALS".



## 6 Installation Information

### 6.1 General Information

- Firmware release V2.20 corresponds to FSCView V2.20, which is available on the Rohde & Schwarz web page as a separate update package.
- Although older versions of FSCView might be able to communicate with firmware release V2.20, an update of FSCView is highly recommended, as older FSCView versions might not support all functions included in the new firmware release.

### 6.2 Firmware Update

The firmware update file for the R&S FSC is one file with the name FSC\_V2\_20.EXE from the Rohde & Schwarz web page.

The installation can be done via SD-Card or via USB-Stick

#### 6.2.1 Preparing the Installation via SD-Card

In order to update the device after downloading the FSC\_V2\_20.EXE installation file, a USB stick is required.

##### **Make a backup of datasets, screenshots and modified files**

Before you start the firmware update, make sure that you created a backup with FSCView of all datasets and screenshots which you previously stored on the instrument. The same holds true for all channel tables, standards, limit lines, transducer factors and cable models which you created or modified. The factory preset necessary to complete the firmware update procedure will otherwise erase or overwrite the files.

##### **Preparing the installation files**

1. Insert an USB stick into the USB slot of the PC and wait until Windows® has identified the USB stick as a new volume (e.g. D:)
2. Copy FSC\_V2\_20.EXE into the root directory of the USB stick, e.g. D:\

Execute FSC\_V2\_20.EXE. The self-extracting .ZIP file will be unpacked.

The SD card should now contain the following files:

bootloader\_FSC\_V2\_20.bin  
osimage\_FSC\_V2\_20.bin  
updater\_FSC\_V2\_20.bin  
splashscreen\_SA.bmp  
FSC\_V2\_20.EXE

**Note:**

Please make sure that only one file of each type is present on the USB stick. The update mechanism will reject the USB stick if it detects two versions of the same file type (e.g. bootloader\_FSC\_V1\_01 and bootloader\_FSC\_V2\_20) in the root directory and abort the update later on.

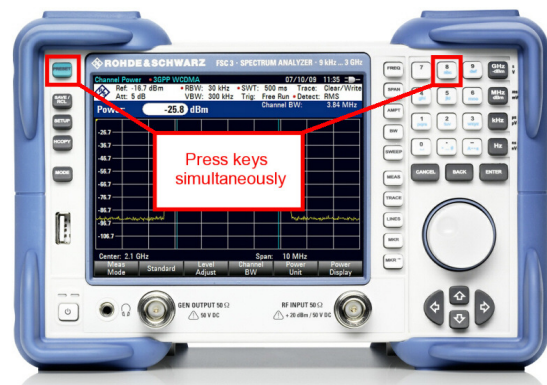
**Prepare the instrument**

1. Switch the instrument OFF.
2. Insert the US B stick into the USB slot of the instrument.

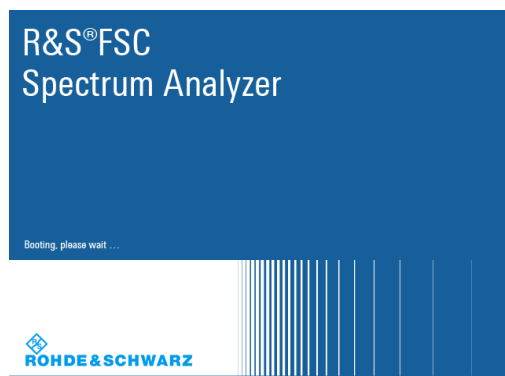
## 6.2.2 Performing the Firmware Update on the Instrument

The firmware update process is performed by the following steps:

1. Press the keys PRESET and 8 on the numeric keypad simultaneously.



2. Switch the instrument on and keep PRESET and 8 pressed for at least 5 seconds after the startup screen has appeared on the screen.



3. Release the keys PRESET and 8.

The FSC will continue its boot process and after a couple of seconds the following information will appear on the screen:

---

**Instrument Firmware Update**

Searching for firmware update (updater\_\*.bin)  
...Found \USB\updater\_FSC\_V2\_20.bin  
...OK  
Checking updater\_FSC\_V2\_20.bin: ... OK

---

Update instrument to software version V2.20  
Press [ENTER] to update the firmware.  
Press [CANCEL] to abort firmware updating.

- 
4. Press ENTER to start the firmware update process.

The instrument will perform the firmware update. This will take about 5 minutes. The progress of the update will be displayed in a sequence of messages on the screen.

**Warning:**

Do not switch the instrument off during the update process in order to avoid data corruption of the internal flash memory! Do not remove the USB stick from of the USB slot during the firmware update!

5. As soon as the firmware update is completed, the R&S FSC will display the following message at the bottom of the screen:

---

Firmware updating is successfully completed.  
Please switch off the instrument.

---

Switch the instrument off and on again. The FSC will boot with the new firmware version.

6. After the boot process is completed, press SETUP – INSTRUMENT SETUP. Select "RESET TO FACTORY SETTINGS" by moving the cursor down the list with the cursor keys or the rotary knob. Confirm the selection with ENTER, and re-confirm with YES when prompted. Please be patient: the subsequent reset and reboot process will take about a minute to complete.

**Note:**

Restoring the factory settings is necessary to update the pre-installed channel tables, cable models and transducer factors. If this step is omitted, bug fixes and updates to these pre-installed files will not be installed.

## 6.2.3 Performing the Self Alignment on the Instrument



This section is relevant for R&S FSC3.13 and R&S FSC6.16 shipped with firmware version V1.30 or below.

In Network operating mode the instrument models R&S FSC3.13 and R&S FSC6.16 support a default set of calibration data, the so-called factory calibration. This dataset is used whenever the instrument displays "uncal" in the title bar.

Instruments which were shipped with firmware versions V1.30 or below need an update of this dataset, as V2.20 uses improved algorithms which need more data in order to obtain optimum results.

The self alignment procedure requires a calibration standard R&S FSH-Z28 (order # 1300.7810.03), which is suitable for R&S FSC3 and R&S FSC6 instruments, or at least a calibration standard R&S FSH-Z29 (order # 1300.7510.03) for R&S FSC3 instruments. In addition a RF cable with two N connectors is required in order to provide a through connection between the instrument ports.

The self alignment is performed by the following steps:

1. Switch the instrument on
1. Select Network operation by pressing MODE – NETWORK ANALYZER.
2. Make sure that the instrument runs for at least 30 minutes at room temperature.
3. Press the keys SETUP – INSTRUMENT SETUP. Place the cursor on the menu entry "Self Alignment" by scrolling the menu bar down with the rotary knob and press ENTER.

The instrument will prompt you to confirm that the factory calibration data will be overwritten.

4. Press softkey YES.

The self alignment procedure will start and prompt you to connect the calibration standards and the through connection to port 1 and 2 in the sequence.

5. Follow the instructions until the instrument reports "Self Alignment Done!".
6. Press softkey EXIT to return to the measurement screen.

## 6.3 Installing Firmware Options

### 6.3.1 Enabling Options by Entering Option Key Codes



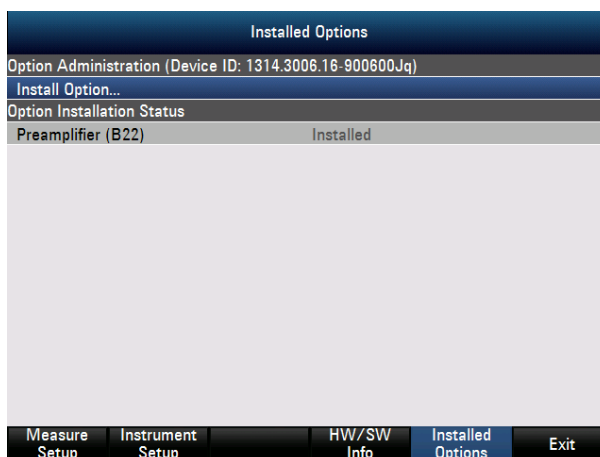
This section can be skipped if the option keys were already entered once. Option keys are not affected by a firmware update.

To activate application software packages, you must enter a license key for validation. The license key is in the device certificate or delivered as a part of the software package. The process is performed in the following steps:

1. Press the SETUP key.
2. Press the softkey INSTALLED OPTIONS.
3. Use the rotary knob or the cursor keys to select the INSTALL OPTION... menu item and confirm the entry with the ENTER key.
4. Enter the key code ( 32 digit number) for the option with the numeric keys and confirm with the ENTER key.

If the correct key code is entered, the R&S FSC displays "Installation successful", and the option is marked as "Installed" in the option list (example: Option Preamplifier (B22)).

If an invalid key code is entered, the R&S FSC displays "Invalid key code!". The correct key code can then be entered.

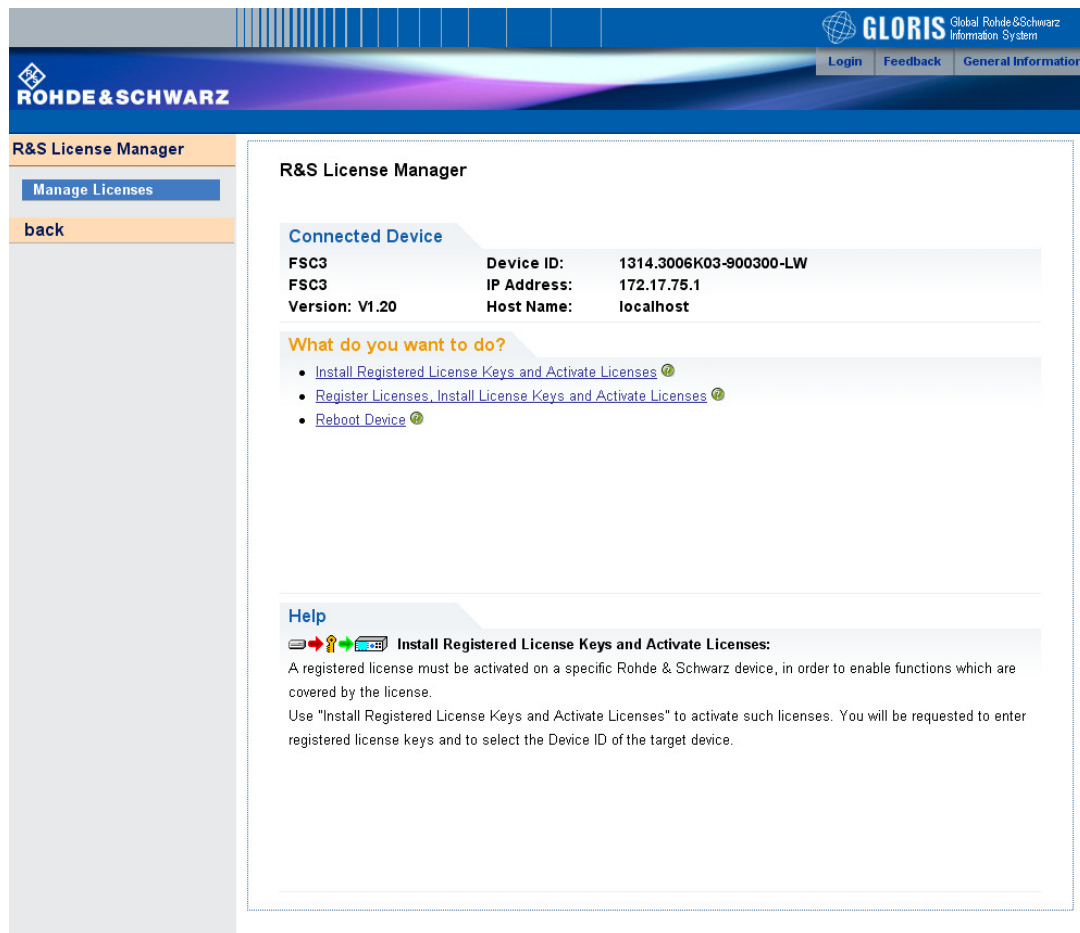


### 6.3.2 Enabling Options via the R&S License Manager

This feature is only available starting with firmware version V1.20.

Prerequisite: Your PC must be connected via Ethernet to the instrument and to the internet.

1. Open your browser and type in the IP address of your instrument.



The screenshot displays the R&S License Manager web interface. The top navigation bar includes the Rohde & Schwarz logo and the GLORIS (Global Rohde & Schwarz Information System) logo. The main content area is titled "R&S License Manager" and features a sidebar with "Manage Licenses" and "back" buttons. The main panel shows the following information:

Connected Device		
FSC3	Device ID:	1314.3006K03-900300-LW
FSC3	IP Address:	172.17.75.1
Version: V1.20	Host Name:	localhost

Below the device information, the "What do you want to do?" section offers three actions:

- [Install Registered License Keys and Activate Licenses](#)
- [Register Licenses, Install License Keys and Activate Licenses](#)
- [Reboot Device](#)

A "Help" section at the bottom provides instructions for "Install Registered License Keys and Activate Licenses":

**Install Registered License Keys and Activate Licenses:**  
A registered license must be activated on a specific Rohde & Schwarz device, in order to enable functions which are covered by the license.  
Use "Install Registered License Keys and Activate Licenses" to activate such licenses. You will be requested to enter registered license keys and to select the Device ID of the target device.

2. Select "License Manager" > "Manage Licenses".
3. Choose "Register Licenses, Install License Keys and Activate Licenses" and follow the instructions.

## 7 Customer Support

### Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz equipment, contact one of our Customer Support Centers. A team of highly qualified engineers provides telephone support and will work with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz equipment.

### Up-to-date information and upgrades

To keep your instrument up-to-date and to be informed about new application notes related to your instrument, please send an e-mail to the Customer Support Center stating your instrument and your wish.

We will take care that you will get the right information.

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