

R&S®FSWT

Release Notes

Firmware Version V4.01

These Release Notes are for following models of the R&S®FSWT Test Receiver:
R&S®FSWT26, order no. 1313.7008.26

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The software makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" provided with the product.

The following abbreviations are used throughout this document: R&S®FSWT is abbreviated as R&SFSWT.



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1 Information on the current version and history

1.1 New functions

The following table lists the new functions and indicates the version in which the new function was introduced:



New function of firmware V4.01:

Version	Function
V4.01	This firmware version does not support devices with operating system Windows 7. Upgrade your device to Windows 10 before installing this firmware version. Contact the Rohde & Schwarz service center for help.
V4.01	R&S FSWT-K553: Supports R&S FE50DTR 50 GHz Up/Down converter, part number 1347.4099.02.
V4.01	R&S FSWT-K553: Supports measurements based on FFT sweep with external frontends. Spurious emission and spectrum emission mask measurements are excluded.
V4.01	New scan types "Channel Scan" and "Threshold Scan" introduced.
V4.01	Support of Settling Time Measurements in AM/FM/PM modulation analysis.
V4.01	Support of Digital I/Q Input (R&S FSWT-B17) in AM/FM/PM modulation analysis.
V4.01	Support of External Frontends in AM/FM/PM modulation analysis. Precondition is R&S FSWT-K553.
V4.01	R&S FSWT-K70: DVB-RCS2 configuration tool offers the selection of the Tx filter roll-off factor (0.05 / 0.1 / 0.2).
V4.01	R&S FSWT-K96: Supports zero padding between OFDM symbols.
V4.01	Support of microwave converter frontend unit, part number 1331.8077.02.

New function of firmware V3.21:

Version	Function
V3.21	Support for the external frontend R&S FE44S 44 GHz Up/Down Converter, part number 1338.7001.02 and for the new option R&S FSWT-K553 External Frontend Control. Supports receiver application, rastering application and "zero span" based measurement modes. The I/Q Analyzer application provides I/Q measurements with an analysis bandwidth up to the bandwidth of the connected external frontend. The firmware version V3.21 includes the external frontend microcontroller firmware V2.1.15. If the firmware versions installed on the analyzer and the external frontend are incompatible, connection to the

external frontend is refused. In that case, update the external frontend firmware (Input Source Config > External Frontend > Global Config > FW update dialog).

V3.21	This is the last firmware version that supports devices with operating system Win 7.
V3.21	The material number, serial number and revision of the HPLP Board, BP Board and RF Attenuator are shown in the logfile of the signal path check.
V3.21	New user interface design (industrial design theme) introduced.
V3.21	Besides the “graphical zoom”  , the new zoom mode “measurement zoom”  is supported. In contrast to the graphical zoom, which is merely a visual tool, the measurement zoom adapts the measurement settings (e.g. reference level, level range, frequency span) such that the data is measured in the required detail. The “measurement zoom” is the default zoom mode for spectrum mode, I/Q Analyzer and Analog Modulation Analysis. The context menu of the “measurement zoom” toolbar icon can be opened with a long touch. Level-Lock (default on), X-Lock and Y-Lock can be used to prevent changing specific settings by the zoom operations.
V3.21	Additional unit “dBm/Hz (Power)” available in amplitude dialog.
V3.21	New result window “Phase vs Time” (unit rad) in I/Q Analyzer available.
V3.21	Application starter functions: Allows starting any external application directly from R&S FSWT firmware.
V3.21	ASCII trace export function has been extended by a selectable column separator in spectrum mode, receiver mode, I/Q Analyzer and Analog Modulation Analysis.
V3.21	Switchable x-axis value distribution in frequency domain.
V3.21	Self-alignment scheduler to perform self-alignments regularly at specific days and times.
V3.21	I/Q data import supports AMMOS intermediate frequency data format (*.aid).
V3.21	Last service date, last calibration date, next calibration due date and recommended calibration interval are indicated in the R&S support dialog.
V3.21	Support of a new Trace Labels function, allowing you to add trace specific-labels.
V3.21	New SCPI command to change the frequency indication between center/span and start/stop: SENSE:FREQUENCY:ANNOtation.
V3.21	The toolbar is now configurable by the user.
V3.21	R&S FSWT-K57: Additional inputs I/Q File and digital baseband interface (R&S FSWT-B17) available as data sources.
V3.21	R&S FSWT-K70: LSB first bit ordering is now supported as demodulation parameter.
V3.21	R&S FSWT-K70: Support for DVB-S2X super frame measurement added in DVB-S2(X) configuration tool.
V3.21	R&S FSWT-K70: Configuration tool for DVB-RCS2 measurements available (linear modulation reference waveforms).
V3.21	R&S FSWT-K70: New mappings "DVB_RCS2" for $\pi/2$ -BPSK, QPSK, 8PSK and 16QAM.

V3.21	R&S FSWT-K70: New predefined digital standard: DMR (Digital Mobile Radio).
V3.21	R&S FSWT-K96: Support cyclic suffix: CONFigure:SYMBol:NSUffix. Support of phase compensation: CONFigure:RFUC:STATe, CONFigure:RFUC:FZERo:MODE, CONFigure:RFUC:FZERo:FREQuency For DFT-S precoding: User can choose how to process OFDM symbols that contain "Don't Care" or pilot cells: CONFigure:TPReCoding:IGNore New parameter Capture Oversampling which can increase the usable bandwidth: [SENSe:]CAPTure:OVERsampling Support of cyclic suffix: CONFigure[:SYMBol]:NSUffix Wizard: Support of custom constellation.

New function of firmware V1.81SP3:

Version	Function
V1.81SP3	Support for CPU board, part no.1206.3974.00

New function of firmware V1.81SP1

Version	Function
V1.81SP1	The analog outputs can be muted while changing the frequency for a variable duration.

New function of firmware V1.81

Version	Function
V1.81	Support for FSWT-K70 Vector signal analysis
V1.81	Support for FSWT-K70M Multi-modulation analysis
V1.81	Support for FSWT-K70P BER PRBS measurements
V1.81	Support for FSWT-K96 OFDM Vector signal analysis
V1.81	Support for FSWT-B517 DIG IQ 40G streaming out interface
V1.81	Support for single side band (SSB) demodulation added to analog outputs
V1.81	Analog modulation analysis: Audio file export (*.wav) added for time domain displays.

1.2 Modified functions

The following table lists the modified functions and indicates the version in which the modification was carried out:

Modifications of firmware V4.01:

Version	Function
V4.01	Digital IQ output (R&S FSWT-B17) and DIG I/Q 40G output (R&S FSWT-B517) cannot be activated simultaneously in IQ Analyzer.
V4.01	The minimum frame rate for auto adjust was increased from 1 Hz to 5 Hz according to the minimum frame rate in the rastering measurement.

Modifications of firmware V3.21:

Version	Function
V3.21	As of Version V3.21, not only the Setup EXE file is signed, but also the individual MSI files inside the Setup EXE file, making the firmware installer even more secure.
V3.21	The following new user coupling parameter were introduced in the raster option: Rastering Line Rate, Trigger Repetition Interval and Trigger Repetition Rate.
V3.21	The marker function "Signal Count" is not available with resolution bandwidth greater than 80 MHz.
V3.21	If the last self-alignment is older than [X] days (default: 30), an info message is shown. A SCPI command and status bit was added accordingly.
V3.21	Maximum number of peaks of marker peak list has been increased to 500.
V3.21	Saving screenshots via SCPI has been optimized. If the chosen file format (HCOpy:DEvice:LANGuage<n>) differs to the file type ending, the file is saved in the format of the file type.
V3.21	In spectrum mode the trace unit conversion for unit "dBm/MHz" was renamed to "dBm/MHz (Power)" and now takes the noise bandwidth into account. In earlier firmware versions the pulse bandwidth was used instead.
V3.21	The default date format was changed to "YYYY-MM-DD" in the GUI.
V3.21	RF attenuation is set to 75 dB during shutdown.
V3.21	In the Analog Modulation Analysis the minimum deviation per division of the AC Time Domain window was changed from 100 uV to 1 uV.
V3.21	R&S FSWT-K57: The user interface has been modified to improve usability.
V3.21	R&S FSWT-K70: Predefined digital standards for Bluetooth now set the bit ordering to LSB first.
V3.21	R&S FSWT-K70: Preview windows have been removed to allow for more compact dialogs.
V3.21	R&S FSWT-K70: In order to better visualize the symbol transitions, the sample points are now connected in the density trace mode for result type 'Vector I/Q'.

Modifications of firmware V1.81:

Version	Function
V1.81	The low pass filter for the Analog Outputs can now be set to lower values. With 10 MHz resolution bandwidth, the minimum low pass frequency is now 10 kHz.

1.3 Improvements

The following tables list the improvements and indicate since which version the issue could be observed:

Improvements of firmware V4.01:

Version	Function
V3.21	If two HiSlip connections were open, closing one of them sometimes ran into a timeout. This issue is solved.
V3.21	In some cases with a low number of sweep points, the graphical marker symbol on the measurement trace in the frequency sweep measurement diagram was misplaced, differing from the actual marker result. This issue is solved.
V3.21	In rare cases, some values in the amplitude dialogue of the receiver measurement were not shown correctly after recalling a save set. Measurements were not affected. This issue is solved.
V3.21	In rare cases, the signal level may drop to -580 dBm when using time domain scan with active auto range and pulsed signals. This issue is solved.

Improvements of firmware V3.21:

Version	Function
V1.81	In rare cases, CALCulate<n>:MARKer<m>:FUNCtion:FPEaks:Y? returned a query error. This issue is solved.
V1.81	Pressing enter in file dialogs did not save or open the file. This issue is solved.
V1.81	Rohde & Schwarz web control file upload failed for file sizes > 8 MB. This issue is solved.
V1.81	Switching off the external generator control could lead to broken traces when trace in view mode. This issue is solved.
V1.81	Firmware did not restart with previous settings after shutting down with remote command SYSTem:SHUTdown. This issue is solved.
V1.81	Opening multiple spectrum windows in Multiview mode and restarting the device possibly blocked the firmware application startup process. This issue is solved.
V1.81	In spurious emission measurement, a trace line was drawn in an empty range. This issue is solved.

V1.81	When entering numbers via touching the soft front panel number block on a connected external touch monitor, the number was automatically entered with unit Hz. This issue is fixed.
V1.81	Having a limit line definition with a limit value outside the current span, sometimes the rightmost limit point was interpreted as a vertical limit line, leading to a "fail" limit result. This issue is solved.
V1.81	The firmware sometimes showed instabilities when repeatedly opening and closing channels. This issue is fixed.

Improvements of firmware V1.81SP4:

since	Function
V1.81	I/Q Analyzer Spectrogram did not update with BW > 80 MHz. This issue is solved.
V1.81	Using Fast Access to step through Peak List omitted manually added peaks. This issue is solved.
V1.81	When using analog output in Log DC Video mode, the "OUTP OVL" indicator was active at low signal levels. This issue is solved.
V1.81	When using IF Gain Auto mode, the displayed IF Gain could deviate from the actual setting. This issue is solved.
V1.81	After running a self test with active transducer factors, error messages could be displayed without cause. This issue is solved.

Improvements of firmware V1.81SP2:

since	Function
---	Updated driver certificates to ensure ability to install FSWT firmware on current windows patch level.
V1.81SP1	The IF spectrogram was reset when changing the center frequency. This issue is solved.

Improvements of firmware V1.81:

since	Function
V1.71	Relative limit lines in AC Video displays in the analog modulation analysis application did not work. This issue is solved.
V1.71	Parameter changes could cause previously deselected limit lines to reappear. This issue is solved.
V1.61	After closing the "Trigger / Gate Config" dialog in the spectrum application, the audio output would not be turned on again. This issue is solved.

1.4 Known issues

The following tables list the known issues and indicate since which version the issue could be observed:

since	Function
Windows Defender Updates 07/24	On devices with operating system Windows 10 IoT Enterprise LTSC 2021 some versions of Windows Defender slow down the firmware startup and the firmware installation. To prevent this, you can add exclusions to the following processes in the Windows Defender: ApplicationManager.exe, Verifikation.exe, AdminServiceController.exe and DriverServiceController.exe.
V4.01	On Windows 10 IoT Enterprise LTSC 2021, the "File Explorer" button in file dialogs (e.g. File -> Recall -> File Explorer, File -> Save -> File Explorer) is disabled.
V3.21	The "measurement zoom" button in the toolbar is always available although some options are not intended to support this feature and the button should be unavailable.
V1.81	K96 OFDM: The y-axis of the Power Spectrum is labeled with dBm instead of the correct unit dBm/Hz.
V1.60	License key installation over R&S License Manager webpage often shows a red error message in the last line. Nevertheless, the license key has been properly installed on the device, which can be seen after the reboot.
V1.00	If the additional software R&S DigIConf should be installed directly on the FSWT, please use the version V03.01.009.30.Build220 SP1 or newer (Beta available upon request) older version may have data transfer problems or show white screens. The R&S DigIConf software might prevent windows to shut down occasionally. If this happens, please select "Force shut down" and confirm.
V1.00	It is anticipated that save sets made with the firmware 1.01 and earlier will not be compatible to this version.
V1.10	The R&S FSWT-B10 (External Tracking) generator option does not work with resolution bandwidth larger than 80 MHz.

2 Modifications to the documentation

The current documentation is up-to-date.

3 Firmware update

The firmware update file for the R&S® FSWT is one file including the main firmware version number, e.g. FSWTSetup_V1.81SP3.exe. It will be referred to as FSWTSetup.exe later in the text. The file can be found on the Rohde & Schwarz web page at <https://www.rohde-schwarz.com/de/firmware/fswt>.

3.1 Providing access to the firmware update file

There are three ways to make the setup FSWTSetup.exe visible to the device:

Using a USB storage device:

1. Copy the file to a directory of the storage device.
2. Insert the storage device in one of the USB connectors of the R&S FSWT.

Using the remote desktop:

1. Connect the R&S FSWT to your LAN.
2. Start the remote desktop on your PC (C:\winnt\system32\mstsc.exe).
3. Enter the required connection settings:
 - TCP/IP address of the instrument you want to update.
To get the TCP/IP address of the R&S FSWT, select [Setup] > "Network + Remote". The IP address consists of 4 numbers between 0 and 255.
 - Enable the "local resources" > "drives" option.
4. Select "Connect".
5. Log in to the instrument using the user name: "instrument" and the default password "894129".
6. Copy the FSWTSetup.exe from your PC to a new folder, e.g. C:\FWUpdate.
7. You can now access this directory with the FSWTSetup.exe from the R&S FSWT firmware.

Using a network drive:

1. Connect the R&S FSWT to your LAN.
2. Establish a connection to one of your servers. (Ask the local IT administrator for support).
3. Copy the FSWTSetup.exe from your PC to a directory on this server.
4. You can now access the directory with the FSWTSetup.exe from the R&S FSWT firmware.

3.2 Performing the firmware update on the instrument

1. Switch on the instrument and wait until the analyzer is ready for operation.

2. If a measurement is running, stop it by pressing the highlighted [Run Cont] or [Run Single] key. Do not update the firmware during a running measurement.
3. Select [Setup] > "System Config" > "Firmware Update" tab.
4. In the file selection dialog box, select the `FSWTSetup*.exe` file from the prepared storage location.
"File Explorer": Instead of using the file manager of the R&S FSWT firmware, you can also use the Microsoft Windows File Explorer to manage files.
5. Select "Install".
6. Select "Next".
A selection list of the available firmware packages is displayed.
7. By default, all applications are installed. Make sure the required applications are selected.
8. Select "Install" to start the update.

After the firmware update, the R&S FSWT reboots automatically.

Depending on the previous firmware version, a reconfiguration of the hardware can be required during the first startup of the firmware. The reconfiguration starts automatically, and a message box informs you about the process. When the reconfiguration has finished, the instrument again reboots automatically.

Note: Do not switch off the instrument during the reconfiguration process!

Now the firmware update is complete.

9. After the firmware update, the "UNCAL" status is displayed in the status bar. Perform a self-alignment ([SETUP] > "Alignment" > "Start Self Alignment").

3.3 Performing the Firmware Update from a Windows PC

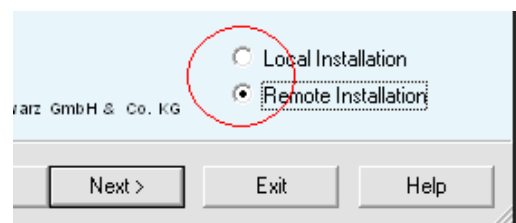
You can also update the firmware using a LAN connection between the instrument and a Windows PC.



Note for firewall users

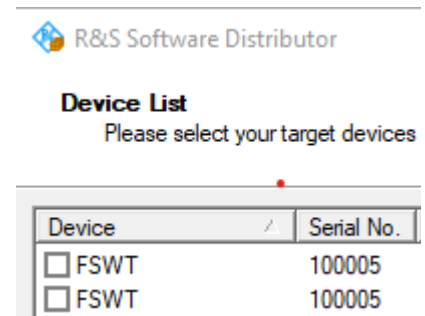
The `FSWTSetup.exe` communicates with the instrument via LAN. Therefore, the `FSWTSetup.exe` must pass the firewall. If necessary, add it to the firewall rules.

1. Run `FSWTSetup.exe` on your PC.
2. Select "Remote Installation".



3. Select "Next".
4. Select the packages to install.
5. Select "Next".

Your LAN subnet is scanned to find all available instruments. If the required instrument is not found, check your firewall settings. After adding the `FSWTSetup.exe` to the firewall rules, restart the scan by selecting "Rescan".

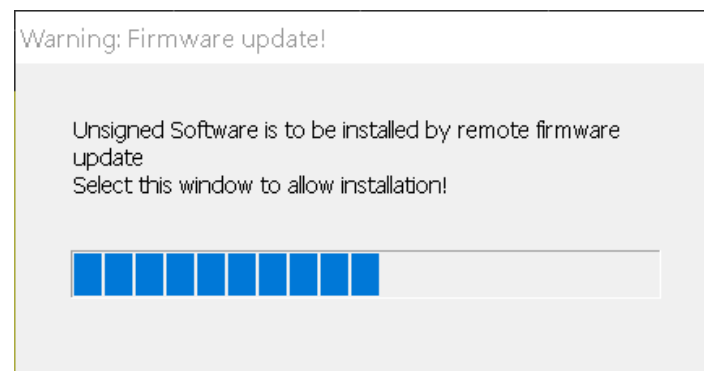


6. Select the instruments you want to update.
You can select up to 5 instruments to update in parallel.
7. If necessary, select "Help" to display additional help.
8. If necessary, select "Options" for further options.
9. Select "Install" to start the installation.

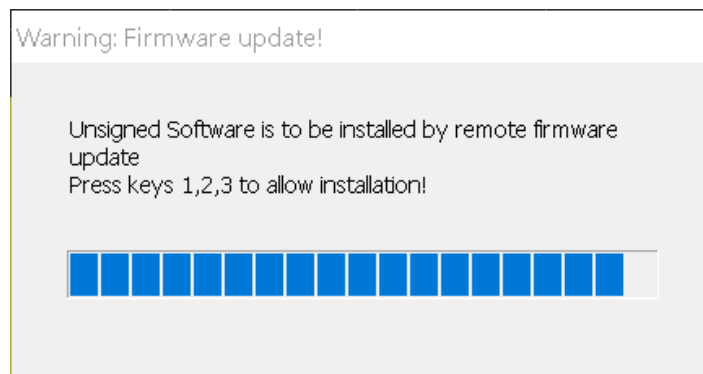
Note on package signing

MSI package signing of setups is a security feature that was added as of firmware version V3.21. It prevents man-in-the-middle attacks with manipulated MSIs during remote firmware installation. After installing a setup file with signed MSI files, installing a setup file whose MSI files are not signed requires an additional step, if you perform the installation from a remote PC. For example, when you downgrade the firmware to a version prior to 3.21. In this case, you must confirm the less secure installation on the device.

After starting the remote installation, the following message is shown on the device.



- a) Tap the message box on the device, or click on it via Remote Desktop. The following message is shown on the device.



- b) Press the keys 1,2,3.
If you do not confirm the installation on the device, it is aborted.
10. Confirm the message to reboot the instrument to activate the firmware update.
The instrument restarts automatically.

3.4 Operation with and without administrator rights

You can operate the analyzer with or without administrator rights. Some administrative tasks (e.g. network configuration) require administrator rights. Updating the firmware is also possible without administrator rights.

In the default configuration, auto-login is enabled, and the "Instrument" account with administrator rights is active. This means that no password is required, and the full functionality of the analyzer is available. An additional user account is predefined with the user name "NormalUser" and the default password "894129". Use standard Windows functionality to deactivate the auto-login mechanism and activate the "NormalUser" account. Also refer to the R&S FSWT Getting Started manual.

3.5 Installing Firmware Options

3.5.1 Firmware options included in basic instrument

The R&S FSWT-K33, FSWT-K53 and FSWT-K57 application software packages are included in the basic instrument firmware. Therefore, they do not have a separate item in the installer to be selected.

3.5.2 Enabling Options by Entering Option Key Codes

To activate application software packages, you must enter a license key for validation. You only have to enter the option key once per option.

If an XML-file with an option key was sent to you, see the installation description below.

The license key is in the device certificate or delivered as a part of the software package.

To enable an option using an option key

1. Select [SETUP] > "System Config" > "Versions + Options" tab.
2. Select "Install Option".
A dialog box is displayed.
3. Enter the option key number using the keypad.
4. Press [ENTER].

After a successful validation, the "Option Key valid" message is displayed. If the validation fails, the option software is not installed.

5. Repeat the activation process for all options you want to install.
6. Reboot the device.
7. Check whether the options are available on the instrument ([SETUP] > "System Config" > "Versions + Options" tab).

To enable options via an XML-file

1. Select [SETUP] > "System Config" > "Versions + Options" tab.
2. Select "Install Option by XML".
A file browser is displayed.
3. Select the path to the XML file (e.g. network drive or USB storage device).
4. Press "Select".

After a successful validation, the "Option Key valid" message is displayed. If the validation fails, the option software is not installed.

5. Repeat the activation process for all options you want to install.
6. Reboot the device.
7. Check whether the options are available on the instrument ([SETUP] > "System Config" > "Versions + Options" tab).

4 Customer support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz product, contact our customer support center. A team of highly qualified engineers provides support and works with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz products.

Contact information

Contact our customer support center at www.rohde-schwarz.com/support or follow this QR code:



Figure 4-1: QR code to the Rohde & Schwarz support page