

R&S®FSWP

Phase Noise Analyzer

Release Notes

Firmware Version V1.90SP1

These Release Notes are for following models of the R&S®FSWP Phase Noise Analyzer:
R&S® FSWP8, order no. 1322.8003.08,
R&S® FSWP26, order no. 1322.8003.26,
R&S® FSWP50, order no. 1322.8003.50,

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

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1 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 functions of Firmware V1.90SP1:

Version	Function
V1.90SP1	Support of RF Frontend (1325.2806.02) for R&S FSWP (for production internal reasons). Note: Instruments equipped with this module require firmware version 1.90SP1 or higher and cannot be downgraded below firmware version 1.90SP1.

New functions of Firmware V1.90:

Version	Function
V1.90	Phase Noise measurements: <ul style="list-style-type: none"> Spurious analysis supports weighting filter (weighted spurious) Spurious analysis supports filter function to show or suppress a defined list of spurious
V1.90	Transient Analysis measurement: <ul style="list-style-type: none"> Supports new measurement chirp linearity Supports new measurement settling time
V1.90	VCO Characterization: <ul style="list-style-type: none"> Supports new diagram Power versus Frequency
V1.90	Phase Noise measurements: New remote command for querying the number of entries in spurious list table. FETCh:PNOise:SPURs:COUNT?
V1.90	R&S FSWP-B1: Supports RBW up to 40 MHz with R&S FSWP-B8E option.
V1.90	R&S FSWP-B1: Number of FFT sub spans is displayed in sweep dialog and can be retrieved via SCPI.
V1.90	R&S FSWP-B1: Frequency offset limit has been extended from 100 GHz to 1 THz.
V1.90	R&S FSWP-B1: Center frequency of imported I/Q files is shown in global info bar when using I/Q File Input mode.
V1.90	R&S FSWP-B10: Supports R&S SMW 12.75 GHz and R&S SMW 31.8 GHz.
V1.90	R&S FSWP-B10: Supports R&S SMA100B 67 GHz.
V1.90	R&S FSWP-K6: The maximum possible analysis pulse width has been increased from 1 million to 25 million I/Q samples.
V1.90	R&S FSWP-K6: The overall measured pulse count is now shown in the Pulse Results table header and per parameter as an extra row in the Pulse Statistics table.
V1.90	R&S FSWP-K6: New Pulse-Pulse Spectrum display useful for doppler measurements. New user-definable Detection Range for analyzing a subset of the acquisition. New fixed-level algorithm for pulse envelope measurements. Incorporation of Trigger Position in Sample into timestamp values for better resolution with external trigger.
V1.90	R&S FSWP-K30: Supports smart noise sources R&S@FS-SNS.
V1.90	R&S FSWP-K30: Supports trace smoothing similar to spectrum mode.

Version	Function
V1.90	R&S FSWP-K50: Supports identification of spur origins using a DUT frequency plan.
V1.90	R&S FSWP-K70: Density trace mode for polar displays and eye diagram.
V1.90	R&S FSWP-K70: New "Marker To" functionality to move the marker to the start of the current result range automatically, i.e. the result range highlighted in blue.
V1.90	R&S FSWP-K70: Various new SCPI commands that facilitate the handling of burst/pattern search scenarios and bit error rate measurements.
V1.90	R&S FSWP-K70: Auto-refresh functionality in Run Single mode.
V1.90	R&S FSWP-K70: New "SMx" mapping for $\pi/8$ -D8PSK and $\pi/4$ -DQPSK.
V1.90	R&S FSWP-K70: Supports QAMs with orders up to 16,384.

New functions of Firmware V1.80:

Version	Function
V1.80	All measurements in Phase Noise Mode: <ul style="list-style-type: none"> Extended ASCII trace export function by selectable column separator Possible values for this column separator are semicolon, comma or tabulator
V1.80	Phase Noise measurements: <ul style="list-style-type: none"> Continuous display of remaining time until measurement is complete Spurious list is now sortable either by spurious power or spurious offset frequency
V1.80	R&S FSWP-B10: Support of generator control for R&S@SMB100B and R&S@SMBV100B
V1.80	R&S FSWP-K7: New marker function AF Phase. This function allows relative signal delay measurements for the AM/FM/PM spectrum result displays.
V1.80	R&S FSWP-K30: Support of measurements with variable RBW and sweep time for frequencies below 10 MHz
V1.80	The behavior of the number block (on the front panel of the instrument) for text input in entry fields and dialogs can now be switched from text (default) to number.
V1.80	I/Q Analyzer and options supporting I/Q data input: For the input source "I/Q File" a repetition number is supported which determines how often the data stream is copied in the I/Q data memory.

New functions of Firmware V1.71SP1:

Version	Function
V1.71SP1	None.

New functions of Firmware V1.71:

Version	Function
V1.71	Phase Noise Measurements: <ul style="list-style-type: none"> Increased measurement speed for offsets > 30 MHz Optimized Smoothing at 100 MHz Stop Offset

1.2 Modified Functions

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

Modified functions of Firmware V1.90SP1:

Version	Function
V1.90SP1	Changed synthesizer setup table for production reasons.

Modified functions of Firmware V1.90:

Version	Function
V1.90	R&S FSWP-B1: The signal path hardware settings for resolution bandwidths between 10 Hz and 100 Hz were adapted for the sweep modes Sweep and FFT.
V1.90	R&S FSWP-K70: The name of the default QPSK mapping has changed from "WCDMA" to "GRAY". The mapping values itself remain identical. Depending on the order of settings in a remote script, this might change the default mappings for other modulation schemes as well.
V1.90	R&S FSWP-K70: The blue marker that highlights the currently analyzed result range in the capture buffer is now also displayed if there is only one result range in the capture buffer.
V1.90	R&S FSWP-K70: Only relevant for capture lengths > 256,000 samples: Title of the window now clarifies whether the entire capture buffer or only a section of the entire capture buffer is displayed.
V1.90	R&S FSWP-K70: Only relevant for capture lengths > 256,000 samples: Lines in the Mag Overview (Capture Buffer) display now visualize which section of the capture buffer is displayed in windows that show only a part of the entire capture, e.g. Mag (Selected CB Section).
V1.90	R&S FSWP-K70: Only relevant for capture lengths > 256,000 samples: Windows that display just a section of the capture buffer only support the trace modes "ClearWrite" and "View".
V1.90	R&S FSWP-K70: Modified layouts for the "Predefined Display Configurations".
V1.90	R&S FSWP-K70: Up/Down increment for the capture length and result length parameters has been increased, both for the scroll wheel step size and for the corresponding SCPI commands.
V1.90	R&S FSWP-K70: Adding/changing a result window triggers an auto refresh on the current capture buffer. The currently selected result range is then the last possible result range in the current capture buffer.
V1.90	R&S FSWP-K70: "Channel Bar" now displays more setting parameters.

Modified functions of Firmware V1.80:

Version	Function
V1.80	VCO characterization - harmonic power measurement: <ul style="list-style-type: none"> To avoid relay clicking when fundamental or harmonic frequencies are located below and above 8 GHz, the measurement sequence was changed. Now, first the power of the fundamental is measured for all measurement points and afterwards the power of the harmonic n is measured for all measurement points.
V1.80	Additive phase noise measurements: <ul style="list-style-type: none"> The measurement result parameter 'gain' is not shown when either RF input with an external local oscillator or baseband input is used.

Version	Function
V1.80	Phase Noise Measurements: The spurious detection algorithm was optimized.
V1.80	Grid annotations are displayed semi-transparently in front of traces to enhance the readability of the annotation values.
V1.80	R&S FSWP-K30: Online help now also supports result displays.
V1.80	R&S FSWP-K30: Maximum number of measurement points increased to 1201.
V1.80	R&S FSWP-K70: The default directories for manual file loading (e.g. user modulation, user filter) are changed
V1.80	R&S FSWP-K70: SCPI commands that involve file loading can now be defined relative to the default directory path, too. (Absolute paths still work as before).

Modified functions of Firmware V1.71SP1:

Version	Function
V1.71SP1	Band breaks (e.g. 8 GHz) aligned with beginning of a measurement point.
V1.71SP1	Optimized synthesizer setup algorithm.

Modified functions of Firmware V1.71:

Version	Function
V1.71	None.

1.3 Improvements

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

Improvements of Firmware V1.90SP1:

Version	Function
V1.90	On some devices, the self-alignment failed. This issue is solved.
V1.80	R&S FSWP-B21: In Phase Noise Mode measurements with two external mixers: <ul style="list-style-type: none"> It was not possible to configure conversion loss tables for mixer 1 and 2 individually The conversion loss average value or table for mixer 2 was not always taken into account properly These issues are solved.

Improvements of Firmware V1.90:

Version	Function
V1.80	R&S FSWP-B1: ACLR measurement limited Multi-Standard Radio standard sub block frequency to 20 GHz. This issue is solved.
V1.80	R&S FSWP-B1: Trace export frequency values in frequency domain could differ from the marker readout frequency values when using an even number of sweep points. This issue is solved.
V1.80	R&S FSWP-K7: Some dialogs did not open when selected from overview dialog. This issue is solved.
V1.10	The command <code>DISPlay:WSElect?</code> was not supported in Phase Noise Mode. This issue is solved.
V1.10	The command <code>LAYout:MOVE[:WINDOW]</code> was not supported in Phase Noise Mode. This issue is solved.
V1.10	R&S FSWP-B1: Transducers in subfolders were not shown correctly in the transducer list. This issue is solved.

Improvements of Firmware V1.80:

Version	Function
V1.70	Persistence Mode in Phase Noise measurements and Transient Analysis measurement: <ul style="list-style-type: none"> The persistence trace is not shown on screenshots. This issue is solved.
V1.70	Phase Noise measurements: After recalling a save set: <ul style="list-style-type: none"> The phase noise diagram scale parameters are erroneously reset. The phase noise frequency auto search limit parameters are erroneously reset. The 'trace offset' parameter erroneously has no effect on the spurious list results No traces are visible in case the 'trace mode' is set to 'view' at creation time of the save set. These issues are solved.
V1.70	RT-ZM probes: The setup of the probe modes "differential mode" (DM) and "common mode" (CM) is mixed up, resulting in the displayed DM level showing the CM level and vice versa. This issue is solved.

Version	Function
V1.50	R&S FSWP-B33 does not show up in the version and option dialog although the USB Mass Memory Write Protection is active. The functionality of the write protection is not affected. This issue is solved.
V1.50	R&S FSWP-K70: Occasionally, mostly after remote operation, the blue marker that highlights the currently analyzed result range is not visible. This issue is solved.
V1.60	R&S FSWP-K7: Relative FM/PM results are not updated in result table. Remote Control is not affected. This issue is solved.
V1.60	Spurious measurement: The entries in the sweep list for "Stop after sweep" are all blank instead of "on" or "off". This issue is solved.
V1.30	PSA Emulation: Trace data request for Real 32 and Real 64 improved.
V1.10	Phase Noise measurements: <ul style="list-style-type: none"> When a measurement is aborted, a change of the trace parameters 'smoothing', 'hide spur' and 'trace offset' have no effect on integrated measurement results. When setting the numbers of cross correlations in 'half decade config mode: manual' to values greater than 10 000 000, the measurement does not start. A query of a limit line without an active limit line does not return an error via remote command <code>CALC : LIM : FAIL ?</code> although <code>SYST : ERR ?</code> returns error code "-200: Execution error;Function not available". Activating a limit line trace check without an active limit line does not return an error via remote command <code>CALC : LIM : TRAC : CHEC ON</code> although <code>SYST : ERR ?</code> returns error code "-200: Execution error;Function not available". These issues are solved.
V1.00	Save / Recall Dialog: Under certain circumstances, selected save items (e.g. 'current settings', 'all traces' etc.) are disabled. This item is solved.

Improvements of Firmware V1.71SP1:

Version	Function
V1.10	FSWP-B60 / B61: In rare cases, the reference coupling sequence executed during firmware startup, showed an error message by mistake ("reference 2 unlock"). This message was then also visible in the system messages. This issue is solved.

Improvements of Firmware V1.71:

Version	Function
V1.70	Phase Noise Measurements: While using a measurement range with offsets below and above 30 MHz, an active persistence trace was erroneously cleared with every measurement. This issue is solved.
V1.70	Phase Noise Measurements: When a hardcopy was created, the grey XCORR gain indicator was printed with opaque background and therefore hid the grid lines and legend of the diagram. This issue is solved.
V1.70	Phase Noise Measurements: When using the Zoom / Multizoom function in a diagram, the values of the Y-axis legend on the right of the zoomed diagram were not updated. This issue is solved.
V1.70	Phase Noise Measurements: When a measurement from 1 MHz to 1 GHz offset, RBW 0.1 % and XCORR Factor 500 was configured, the XCORR gain indicator (grey area) above 40 MHz offset was not always updated correctly. This issue is solved.
V1.70	FSWP-B320: Creating a new application channel for applications I/Q Analyzer, FSWP-K6, FSWP-K7, FSWP-K50, FSWP-K60 or FSWP-K70 in the context of an active Phase Noise channel or Spectrum Monitor channel sporadically lead to an erroneous restriction of the analysis bandwidth to values below 320 MHz. This issue is solved.

Version	Function
V1.70	FSWP-K6: The order of table headers and table column data did not correctly match up in an exported CSV file. This issue is solved.

Improvements of Firmware V1.70:

since	Function
1.30	VCO Characterization measurement: <ul style="list-style-type: none">• The VCO measurement slowed down when a second Phase Noise channel with a small RBW was created. This issue is solved.• When a save set was recalled and DC power was reactivated afterwards, no traces for new measurements were visible in the diagrams. This issue is solved.
1.50	Transient Analysis measurement: The increment / decrement step size for parameter 'Meas Time' did not match the user manual description. This issue is solved.
1.60	On instruments without FSWP-B1 Spectrum Analysis, power sensors were not supported. This issue is solved.

1.4 Known Issues

The following table lists the known issues and indicates since which version the issue could be observed:

since	Function
-	<p>For devices including the patch "Apply MS17-010 to prevent WannaCrypt attacks" - Microsoft Patch KB4012212: When starting the self-alignment or self-test, the corresponding result dialog is hidden. The measurements themselves are performed correctly in the background. Workaround: Select the orange colored "Alignment" or "Service+Support" softkeys or simply touch the screen. The result dialogs appear again.</p>
V1.80	<p>License key installation via the R&S License Manager webpage often shows a red error message in the last line. Nevertheless, the license key is properly installed on the device, which can be seen after the reboot.</p>
V1.70	<p>R&S FSWP-K6P Pulse Stability measurements: Bandwidths below 400 kHz (Gauss) and 2 MHz (Flat) are not supported with the Low Noise digitizer mode.</p>
V1.70	<p>Persistence Mode in Phase Noise measurements and Transient Analysis measurement: The persistence trace is cleared when the diagram Y-axis scaling parameters change. This may be the case in diagram scale mode "auto". To prevent this behavior, set the diagram scale mode to "manual".</p>
V1.20	<p>R&S FSWP-K6:</p> <ul style="list-style-type: none"> ● After recalling a Pulse channel that was saved after a RUN SINGLE operation, the RUN SINGLE button is lit but no measurement is running. ● The "view" trace behaves like a "clear write" trace. ● After aborting a measurement via SCPI (:ABORT) the status bar still shows "Measuring...".

1.5 Windows 10

FSWP running operation system Windows 10 are using Windows 10 IoT Enterprise LTSC. (IoT stands for Internet of Things and is the embedded version of Windows 10. LTSC stands for Long Term Servicing Branch, which means a long support period of Windows patches.)

1.6 “Missing smartcard” message

For FSWP phase noise analyzer produced November 2017 or later, the message “Missing smartcard or smartcard not initialized” may appear after starting the device. This only happens if a firmware below V1.60 is used. Either because a downgrade to a version below V1.60 had been performed, or the solid state drive was exchanged with a version below V1.60.

Solution: Please install firmware V1.60 or higher. The device will boot as usual.

1.7 Modifications to the Documentation

The latest documentation is available for download from the Rohde & Schwarz website at:

<http://www.rohde-schwarz.com/manual/fswp/>

2 Firmware Update

The firmware update file for the R&S FSWP is one file including the main firmware version number e.g. FSWPSetup_V1.90SP1.exe. It will be referred as FSWPSetup.exe later in the text. The file can be found on Rohde & Schwarz web page at

<http://www.rohde-schwarz.com/firmware/FSWP>.

2.1 Performing the Firmware Update on the Instrument

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

Using a memory stick:

1. Copy the file to a directory of the memory stick and insert the memory stick into one of the USB sockets of the R&S FSWP.

Using the remote desktop and copying the installation files to a directory of the instrument:

1. Connect the R&S FSWP to your LAN.
2. Start the remote desktop on your PC (C:\winnt\system32\mstsc.exe).
3. Enter the TCP/IP address of the instrument you want to update. Ensure that the "local resources" > "drives" option is selected and press the "Connect" button. (To get the TCP/IP address of the R&S FSWP press the hard key "Setup" and then the soft key "Network + Remote". The IP address consists of 4 numbers between 0 and 255.
4. Log in to the instrument (user name: "instrument" and default password "894129").
5. Copy the FSWPSetup.exe from your PC to a new folder e.g. C:\FWUpdate.
6. You can now access this directory with the FSWPSetup.exe from the R&S FSWP analyzer firmware.

Using a network drive:

1. Connect your R&S FSWP to your LAN, and establish a connection to one of your servers. (Ask the local IT administrator for support)
2. Copy the FSWPSetup.exe from your PC to a directory on this server
3. You can now access the directory with the FSWPSetup.exe from the R&S FSWP analyzer firmware.

Performing the update on the instrument:

The firmware update process is performed by the following steps:

1. Switch the instrument on and wait until the Analyzer has resumed operation.
2. Press the "SETUP" key, then "System Config", and select the "Firmware Update" tab.

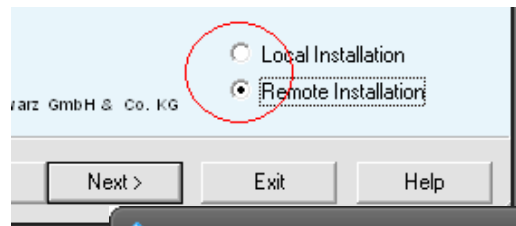
A file browser is displayed to select the proper FSWP*.exe setup file. Change the path to the drive and directory which you prepared in the step before (USB stick directory, remote PC directory or directory on a server) and close the dialog with the "Install" button.

3. Press the "Next" button to come to the selection of the firmware packages. By default all application should be installed. Ensure that the required applications selected.
4. Press the "Install" button.
The firmware is stopped and the installation starts. After a few minutes the system restarts automatically. After the restart the firmware installation is complete. After the firmware update the "UNCAL" flag appears. A self alignment is necessary.
5. Press the "SETUP" key, select "Alignment" and then "Start Self Alignment" to invoke the alignment procedure.

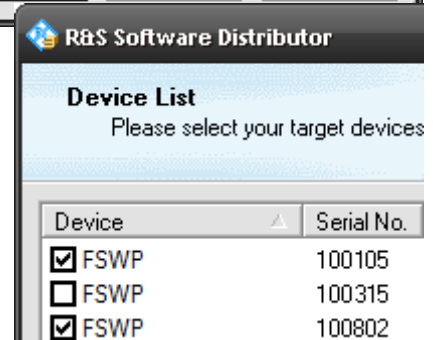
2.2 Performing the Firmware Update from a Windows PC

The new firmware can also be uploaded without using a memory stick or a network drive. Just a LAN connection from the instrument and a Windows PC is necessary.

1. Run FSWPSetup.exe on your PC.
2. Select "Remote Installation" and then "Next".



3. Select the packages to install and then "Next".
HINT FOR FIRE WALL USERS: The FSWPSetup.exe communicates with the instruments via LAN. Therefore it is necessary that the FSWPSetup.exe may pass the fire wall. After adding it to the fire wall rules, restart the scan by clicking on "Rescan".



4. After scanning your LAN subnet all found instruments are listed. Select the instruments you want to update.
It is possible to select up to 5 instruments for updating in parallel.

NOTICE

Be careful and check twice if you have selected the correct instruments. Depending on your company's network structure, also instruments of other departments will show up!

5. Select "Help" to display additional help.

6. Select "Options" for further options.
7. Select "Install" to start the installation.
8. Confirm that you want to reboot the instrument in order to activate the firmware update (the instrument then restarts automatically)

2.3 Operation with and without Administrator Rights

The analyzer may be operated with or without administrator rights. Some administrative tasks (e.g. LXI functions or network configuration) do require administrator rights. A firmware update 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 (user name "NormalUser" with default password "894129") is pre-defined. Use standard Windows functionality if you wish to deactivate the auto-login mechanism and activate the "NormalUser" account. Please refer also to the R&S FSWP Getting Started Manual.

2.4 Installing Firmware Options

2.4.1 Firmware Options Included in Basic Instrument

The R&S FSWP-K7 and R&S FSWP-K33 application software package is included in the basic instrument firmware. Therefore, they do not have a separate item in the installer to be selected.

2.4.2 Other Firmware Options within the FSWPSetup.exe File

The R&S FSWP-K6/S/P, R&S FSWP-K30, R&S FSWP-K50, R&S FSWP-K60/C/H and R&S FSWP-K70 application software packages have their own installation item and are therefore added to the selection list during the firmware update. Ensure that the checkbox is checked if the installation is requested.

Note: The functionality of FSWP-K6S is integrated within FSWP-K6 and is activated by its own key code. The functionality of the FSWP-K60C and FSWP-K60H are integrated within FSWP-K60 and are activated by their own key code.

2.4.3 Enabling Options by Entering Option Key Codes

NOTICE

This section can be skipped if the option key was entered once.

To activate application software packages, you must enter a license key for validation.

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

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. Go to the "Versions + Options" tab.
3. Press the "Install Option" button.
A dialog box is displayed.
4. Enter the option key number using the keypad.
5. Press "ENTER".
After a successful validation the "Option Key valid" message is displayed. If the validation failed, the option software is not installed.
6. Reboot the device.

Installation of options via XML-file

1. Press the "SETUP" key.
2. Go to the "Versions + Options" tab.
3. Press the "Install Option by XML" button.
A file browser is displayed.
4. Select the path to the XML file (e.g. network drive or USB stick)
5. Press "Select".
After a successful validation the "Option Key valid" message is displayed. If the validation failed, the option software is not installed.
6. Reboot the device.

3 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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