R&S®FSW
Signal and Spectrum Analyzer
Release Notes
Firmware Version V2.00

These Release Notes are for following models of the R&S®FSW Signal and Spectrum Analyzer:

R&S® FSW8,	**order no. 1312.8000K08,**	**R&S® FSW13,**	**order no. 1312.8000K13,**
R&S® FSW26,	**order no. 1312.8000K26,**	**R&S® FSW43**	**order no. 1312.8000K43,**
R&S® FSW50,	**order no. 1312.8000K50,**	**R&S® FSW67,**	**order no. 1312.8000K67**

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

Test and Measurement
Release Notes
PAD-T-M: 3574.3288.02/02.00/CI/1/EN/

ROHDE&SCHWARZ

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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 V2.00:

Version	Function
V2.00	FSW43, 50, 67: Support of IF output with 2 GHz bandwidth. The "IF 2GHz Output" is supported in Spectrum mode (zero span), I/Q mode and also in the option FSW-K70 (VSA) for frequencies above 8 GHz.
V2.00	Out of range behavior in entry fields in manual operation can be changed from 'Warning' to 'Set Max/Min Value'.
V2.00	PSA emulation: For remote control by VXI-11 or Raw Socket protocol the termination with <LF><CR><LF> (0xA, 0xD, 0xA) is now supported.
V2.00	FSW-B500: Support of IQ Power Trigger
V2.00	FSW-K6: Support of "Segmented Capture" mode for I/Q data acquisition. This allows coherent processing of multiple trigger events and improves acquisition efficiency by capturing only the pulse "on" samples. Supports RF input with up to 80 MHz I/Q bandwidth (B80) or 160 MHz of I/Q bandwidth (B160). Supports external, IF power and RF power triggers.
V2.00	FSW-K6: Support of "Result Range Spectrum" result display. This display shows the power spectrum of the I/Q data contained within the Result Range interval. Supports auto and manual modes for RBW. Supports window types Rectangular, Bartlett, Hamming, Hann and Blackman.
V2.00	FSW-K6: Frequency values can now be optionally shown as relative (to the center frequency) or absolute. The setting is available under [AMPT] -> "Unit Config". This applies to the Pulse Frequency result display, the Result Range Spectrum result display and the Frequency column of the Pulse Results table.
V2.00	FSW-K10: Support of 'Auto Frequency' feature. In Multi-Carrier Wideband Noise (MCWN) mode: User now gets a warning if an active carrier is outside the span.
V2.00	FSW-K72: The number of analyzed slots can be reduced to increase the measurement speed.
V2.00	Support for FSW-K103 EUTRA / LTE Advanced UL measurements
V2.00	FSW-K100/104: New function Marker Coupling for synchronization of markers between displays. FSW-K100/104: Support of Cumulative ACLR (requires the option FSW-K102) FSW-K101/105: Support of Multi-Carrier ACLR for measuring the ACLR of carrier aggregated signals (requires the option FSW-K103) FSW-K101/105: Spectrum emission mask now supports the measurement of carrier aggregated signals (requires the option FSW-K103)
V2.00	FSW-K91/P/N/AC: New measurement result: IQ Skew

New functions of Firmware V1.93:

Version	Function
V1.93	Support of Detector Board 2 with part no. 1313.7050.xx.
V1.93	Support of additional RBWs 20 MHz, 28 MHz, 30 MHz and 50 MHz with span > 0 Hz (requires Detector Board 2)
V1.93	FSW-K76: Supporting synchronization on slot 0 for signals without DwPTS FSW-K77: Support of UpPTS evaluation FSW-K77: Support of time synchronization on UpPTS FSW-K77: User can now define the maximum modulation type in order to avoid false detection
V1.93	FSW-K91/P/N/AC: Support of FSW-B17 Digital Baseband Interface FSW-K91/P/N/AC: Support of FSW-B71 Analog Baseband Inputs FSW-K91/P/N/AC: Support of AM/AM, AM/PM, AM/EVM measurements FSW-K91AC: Support of proprietary 1024 QAM. Using the temporary MCS indices 10 and 11. FSW-K91/P/N/AC: Support of 'PVT Rising' and 'PVT Falling' diagram FSW-K91/P/N/AC: Support of Frequency Error vs Preamble Samples measurement FSW-K91AC: Analysis of up to 8 Tx antennas for IEEE802.11ac MIMO capable devices FSW-K91/P/N/AC: Unit selection dB, % for diagrams 'EVM Measurements EVM vs Carrier', 'EVM vs Symbol' FSW-K91: Support of IEEE 802.11j standard FSW-K91N/AC: Support for R&S FS-Z11 Trigger Unit or FSW Trigger Output for simultaneous MIMO measurements
V1.93	FSW-K101/105: Support of LTE Uplink in MSRA mode

New functions of Firmware V1.92:

Version	Function
V1.92	Support for FSW-K60 Transient Measurements Support for FSW-K60C Transient Chirp Measurements Support for FSW-K60H Transient Hop Measurements
V1.92	FSW50: Support for Preamplifier FSW-B24 with order no. 1313.0832.49 and 1313.0832.51

New functions of Firmware V1.91:

Version	Function
V1.91	Spectrum Emission Mask (SEM): Multi-SEM measurement now supports non-contiguous multi standard radio base stations. Up to three sub blocks with individual range definition and the possibility of summing up limits in the sub block gaps are available now.
V1.91	SEM measurement: The minimum number of sweep points per range can now be defined. The number of measurement points obtained in narrow frequency ranges can thus be increased manually compared to the default value.
V1.91	Mini Front Panel (invoke with ALT+M) enhanced with unit keys.
V1.91	FSE emulation: Support for `INP:ATT:AUTO:MODE NORM` added.
V1.91	PSA emulation: Support for `CALC:MARK:CENT` added.
V1.91	FSW-B71: I/Q Analyzer: Remote control: Support for Average Power Consumption calculation added
V1.91	FSW-B71: Remote control: Support for setup of the Common Mode Offset of differential probes and support for user defined DC offsets for I and Q input individually added.
V1.91	FSW-K17: Smoothing of group delay traces supported
V1.91	FSW-K33: Added confirmation dialogs during setup of new passwords

New functions of Firmware V1.90:

Version	Function
V1.90	Support for FSW-B500: 500 MHz analysis bandwidth in I/Q Analyzer, FSW-K6, FSW-K7, FSW-K17 and FSW-K70
V1.90	Sub folders for transducers and limit lines can now be used.
V1.90	MSRA: Support for I/Q export
V1.90	I/Q Analyzer: Support for swapping I/Q
V1.90	FSW-B10: Support for R&S SMW added
V1.90	FSW-K6: A more advanced Parameter Spectrum algorithm is available which can handle pulses sequences with large gaps between pulses. More control over the spectrum calculation manual mode is supported, e.g. frequency range and window type can be changed.
V1.90	FSW-K6: Support to export only the I/Q data from the Result Range of the Selected Pulse (or the entire capture buffer as before).
V1.90	FSW-K6: Added support for the MSRA mode.
V1.90	FSW-K7: Export trace to ASCII file supported via remote control
V1.90	FSW-K10: Support for multicarrier BTS measurements as in chapter 6.12 of 3GPP TS 51.021.
V1.90	FSW-K40: New mechanism to finish averaging/measuring sooner: Finish Half Decade. New remote command is `[SENSe]:SWEep:FHDecade`
V1.90	FSW-K40: New results display showing Frequency and Level stability.
V1.90	FSW-K40: New remote commands added under `FETCh:PNOis:SWEep` to obtain results from the Sweep Results Display List
V1.90	FSW-K70: New modulation orders 2048QAM and 4096QAM
V1.90	FSW-K70: New SCPI command `CALC:Y:UNIT:TIME S|SYM` for switching y-unit of equalizer group delay measurements
V1.90	FSW-K91N: Analysis of up to 4 Tx antennas for IEEE802.11n MIMO capable devices
V1.90	FSW-K91AC: Analysis of up to 4 Tx antennas for IEEE802.11ac MIMO capable devices
V1.90	FSW-K100/K104: Time Alignment Error measurement now supports Carrier Aggregation. FSW-K100/K104: Support of MIMO measurements with multiple devices. FSW-K100/K104: Support of new enhanced features for PDSCH Subframe Configuration. All these functions require option FSW-K102.
V1.90	FSW-K100/K104: Support of new Result Displays: EVM vs Symbol x Carrier, Power vs Symbol x Carrier, Allocation ID vs Symbol x Carrier and UE-Specific RS Weights Magnitude
V1.90	FSW-K160R: Support for Multi Standard Realtime Mode (MSRT): The MSRT supports the use of a Frequency MaskTrigger and analysis the captured data in the following options: FSW-K6, FSW-K7, FSW-K70 and I/Q Analyzer

V1.90	PSA emulation extended with the following commands:
	`[SENSe]:POWer:ATTenuation` changed to
	`[SENSe]:POWer[:RF]:ATTenuation`
	`[SENSe]:POWer[:RF]:ATTenuation:AUTO`
	`[SENSe]:AVERage:COUNt, [SENSe]:AVERage[:STATe]`
	`[SENSe]:AVERage:CLEar, [SENSe]:DETector[:FUNCtion]`
	`[SENSe]:DETector:AUTO, TRAC:MODE`
	`MMEM:STOR:SCR, CALC:MARK:FCO:STAT`
	`CALC:MARK:FCO:X?, CALC:MARK:FCO:GAT:AUTO`
	`TRAC:DATA, FORMat:BORD` changed to `FORMat:BORDer`

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 V2.00:

Version	Function
V2.00	Spectrum Emission Mask: Multi-Standard Radio (MSR) limits now compliant with specification 3GPP TS 37.141 V12.2.0.
V2.00	Selfalignment of IF path extended.
V2.00	Modified synthesizer setup table.
V2.00	HP emulation: Support MKPK HL
V2.00	FSW-K6: Increased the maximum possible Result Range length from 100,000 to 1,000,000 I/Q samples.
V2.00	FSW-K10: Changed format of Limit Line response returned by SCPI : Start and stop frequencies are rounded to multiples of 1 Hz. Multiple adjacent segments are merged to a single one if possible (same limit level, no gap).
V2.00	FSW-K10: The minimum value for parameter 'capture time' is calculated as follows: For 'trigger source' set to 'external': (First Slot to measure+Number of Slots to measure+0.5) * T_slot , with T_slot = 577 us. For 'trigger source' set to 'Free Run': 10 ms
V2.00	FSW-K70: The maximal capture length has been increased to 200 000 000 samples. See chapter 1.6.
V2.00	FSW-K70: Minimum roll off of RRC filters reduced from 0.1 to 0.05 (needed for DVB-S2X)
V2.00	FSW-K160R & I/Q Analyzer: Modified signal path settings for start frequency < 130 MHz and span > 80 MHz
V2.00	FSW-K160R: Spectrogram areas which cannot be zoomed are now displayed darker and in gray.

Modified functions of Firmware V1.92:

Version	Function
V1.92	Modified synthesizer setup table.

Modified functions of Firmware V1.91:

Version	Function
V1.91	ACLR: Frequency setup improved to eliminate switching point at 1 GHz.
V1.91	FSW-K6: Table scrolling enhanced: Non scrolling heading for index columns added.
V1.91	FSW-K6: Y-Scaling now adjusts to limit lines whenever the lines are visible on a Parameter Trend display.

Modified functions of Firmware V1.90:

Version	Function
V1.90	Increased the maximum sweep points for Spectrum, I/Q analyzer and FSW-K7 from 32001 to 100001. (FSW-K54 remains with maximum sweep points 200001)
V1.90	FFT overlapping to smoothen the level display between two FFTs introduced.
V1.90	IF/Video output now also available in time domain power measurement
V1.90	The remote command `:SYSTem:REBoot` will now reboot the operating system as well and not only the firmware application.
V1.90	Changing the reference level offset will also change the limit line with relative y-values. (aligned

Version	Function
	behavior to FSU/FSQ)
V1.90	FSW-B10: Support long computer names for generator setup (e.g. for name of R&S SGS)
V1.90	FSW-K10 Multicarrier parameters modified: BTS Class parameter and `CONFigure:MS:MCARrier:BTSClass` removed. Previously the standard supported BTS classes 1 and 2. Now three new device types have been introduced as device type (Multicarrier BTS Wide Area, Medium Range, Local Area). Compatibility mode for `CONFigure:MS:MCARrier:ACTCarriers` introduced. Compatibility mode for `CONFigure:MS:MCARrier:MCBTs` and `CONFigure:MS:MCARrier:STATe` introduced. New Carrier tab added to Signal Description dialog.
V1.90	FSW-K10: MEAS key now opens dialog to select the measurement mode (I/Q or Multicarrier Wide Spectrum mode)
V1.90	FSW-K10: Device tab of Signal Description dialog split into a Device and a Frame tab.
V1.90	FSW-K30: The maximum for the y-scale settings of graphs with dB scaling has been increased from 75 dB to 100 dB.
V1.90	FSW-K30: `CALCulate:LIMit:ACTive?` now returns all active limit lines, regardless of whether they have been activated through SCPI or GUI.
V1.90	FSW-K30: The way invalid results are represented in `TRACe:DATA` and Trace Export has been changed to conform to the SCPI99 specification (FSW-K30 previously returned -200, it now returns 9.9e+037).
V1.90	FSW-K40: Spur suppression can now also be controlled for each trace. New remote command is `DISPlay:TRACe{1...6}:SPURs:SUPPress[:STATe]`
V1.90	FSW-K70: Auto level measurement with trigger now can be aborted.
V1.90	FSU/FSQ emulation: Allow maximum reference level of 5 dBm if manual attenuation is 0 dB.

1.3 Improvements

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

Improvements of Firmware V2.00:

since	Function
V1.90	FSW-B500: For sample rates greater than 600 MHz record lengths above 230 MSamples will show corrupt data. This issue is solved.
V1.90	FSW-B500 and Multi-Standard Radio Analyzer (MSRA) mode: For RF measurements inside the I/Q analyzer the message "wait for trigger" occurs and the sweep will not finish. Sample rates <= 100 MHz are working. This issue is solved.
V1.90	FSW-K10: Improved manual scaling of y-axis of diagrams, to ensure 10 divisions with rounded values. SCPI command `:CONFigure:MCARrier:ACTCarriers DEFAULT` now sets the number of carriers to one (instead of zero). When being in Multi-Standard Radio Analyzer (MSRA) mode the IQ import is now deactivated. In Multi-Carrier Wideband Noise (MCWN) mode: When changing multi-carrier setup back and forth the setting 'gap start after carrier' is restored in the GUI.
V1.51	FSW-K10: In multi measurement mode the 'modulation spectrum list' now defaults to the '1.8 MHz list' (before '1.8 MHz sparse list'). Issuing the `CONF:BURS:PTEM` commands will not change the window layout or start an auto refresh in multi measurement mode.
V1.90	FSW-K160R: After using the realtime mode once, the transducers are not available in spectrum mode unless the device is rebooted. This issue is solved.
V1.93	FSW-K160R: Clicking on the color legend bar now opens the color mapping dialog box.
V1.93	FSW-K91: In case of an OVLD in Amplitude Manual Mode, the OVLD indicator wasn't cleared after Amplitude Auto Mode was selected. This issue is solved.

Improvements of Firmware V1.93:

since	Function
V1.92	Spectrum Emission Mask: Using the standard file TD_SCDMA_DL.XML and switching the Symmetrical Setup Mode to On leads to a firmware lock up. This issue is solved.
V1.90	For frequencies > 8 GHz, RBW = 100 kHz, span < 100 MHz, YIG Filter active and sweep mode "sweep" the level readings can be too low. This issue is solved.
V1.91	FSW-K6: With the Gauss Filter set to 250 MHZ BW (default with option B320) the IQ export function would produce a corrupted IqTar file. This issue is resolved.
V1.92	FSW-K91: 'Signal Field' measurement results had been missing. This issue is solved.

Improvements of Firmware V1.92:

since	Function
V1.60	FSW-K77: Improved the signal detection of signals with large differences in frequency offset, clock offset and level between slots.
V1.50	FSW-K101/105: Improved synchronization of signals with low SNR and large carrier leakage.

Improvements of Firmware V1.91:

since	Function
V1.10	Trace update in Zero Span mode for larger sweep time (with small RBW and high number of sweep points) is now in all cases performed during the sweep and not only at the end of a sweep.
V1.10	Duplicating a channel did not work after a "Recall in Current Channel". This problem is solved.
V1.90	When loading a save set which was created with a FW version < 1.90, the result display could not be configured anymore. The evaluation bar under the Display Config softkey displayed empty buttons. This problem is solved.
V1.90	FSW-B500: For sample rates above 600 MHz triggers are not working reliably. The same situation is valid for FSW- K17 if the span is wider than 480 MHz. This issue is solved.
V1.90	FSW67: For some center frequency/span setup a firmware lock up may happen (e.g. after preset setting center frequency to 45GHz). This issue is solved.
V1.81	FSW-K6: `TRACe:DATA:X` returns Y data on Pulse Magnitude, Frequency and Phase displays. This issue is resolved.
V1.90	FSW-K6: Changing the Parameter Spectrum configuration may result in a long processing delay. This issue is solved.
V1.90	FSW-K6: The phase units displayed in the edit box for pulse parameter limits may be incorrect after PRESET. This issue is solved.
V1.90	FSW-K91: In case "number of space time streams (STS) > number of spatial streams (SS)", the Rx antenna results: *IQ Offset, Gain Imbalance, Quadrature Offset, PPDU Power, Crest Factor* for the second STS stream were missing [2Tx X 2Rx setup]. This issue is solved
V1.90	FSW-K100/102/104: When measuring MIMO and recalling a save set containing the same IP-addresses of the connected devices, the measurement stopped working. This problem is solved.

Improvements of Firmware V1.90:

since	Function
V1.80	I/Q Import Dialog: Selecting a file was only possible by double clicking. This Select softkey is now available again.
V1.10	After closing the data entry for new option keys once, entering further key code was never accepted unless the firmware was restarted. This issue is solved.
V1.70	APD: Recalling a save set with y-unit percent changed the scaling. This issue is solved.
V1.10	Transducers with same units and all transducers in unit dB can now be combined. The button for selecting transducers is now correctly horizontally aligned with the name of the transducer.
V1.81	FSW-K6: In certain cases the Result Range displays would not correctly update when changing

since	Function
	the Selected Pulse. This issue is resolved.
V1.82	FSW-K10: Modulation spectrum limit at 1.8 MHz offset corrected for BTS Micro.
V1.81	FSW-K30: The DANL values used by the Uncertainty Calculator were incorrect for some configurations of instrument and hardware options. This issue is solved.
V1.70	FSW-K30: The calibration status check did not differentiate between the 15 dB and 30 dB preamplifier settings. This issue is solved.
V1.11	FSW-K40: Reference Measurement soft key restarts an already running reference measurement, instead of aborting it. This issue is now solved.
V1.70	FSW-K40: Calculation of Random Jitter value in the Spur List was incorrect in some cases. This issue is now solved.
V1.81	FSW-K160R didn't work with FSW67

1.4 Known Issues

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

since	Function
V1.81	If the additional software R&S DigIConf should be installed directly on the FSW, 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.
V1.41	FSW-K6: After aborting a measurement via SCPI (:ABORt) the status bar still shows "Measuring...".
V1.41	FSW-K6: The following commands are not available: `[SENSe:]FREQuency:CENTer:STEP` `[SENSe:]FREQuency:CENTer:STEP`
V1.51	FSW-K6: After recalling a Pulse channel which was saved after a RUN SINGLE operation, the RUN SINGLE button is lit but no measurement is running.
V1.51	FSW-K6: The zoom mode on trace displays is not function correctly. Trace displays are not updated when changing the zoom position and marker icons are not correctly displayed on the traces.
V1.60	FSW-K10: Cumulating of Modulation Spectrum limits of carriers of a multicarrier BTS not supported for frequency offsets < 1.8 MHz of the outmost carrier.
V1.80	FSW-K17: When moving markers whilst measuring the group delay it sometimes can happen that the trace shows significantly high values. As a workaround move markers in a sweep stop condition.
V1.21	FSW-K30: After Recall the trace displays are not updated correctly
V1.42	FSW-K91, -K91n, -K91ac: In case the instrument is waiting for a trigger this message is not displayed in the status bar.
V1.90	FSW-K91: When measuring MIMO and recalling a save set containing the same IP-addresses of the connected devices the measurement will stop working. Please delete the shutdown file 'C:\R_S\Instr\results\Shutdown.dfl' and power cycle the FSW on the rear main switch.
V2.00	FSW-K91: Please use not more than three FSW-K91 channels - at maximum capture time - to ensure that the memory of the application is not exceeded.
V1.80	FSW-K160R: No full support of trigger outputs. "Device Triggered" mode for "Frequency Mask Trigger" is available for trigger output 3 only.
V1.80	FSW-K160R: Persistence Spectrum not available if the device is used via Windows Remote Desktop.
V1.90	FSW-K160R: Auto Adjust functions are not available in MSRT mode.

1.5 Changing of solid state disks between different types of CPU boards

For the FSW spectrum analyzer different CPU boards are in use: IPC10 with order no. 1206.0223 and IPC11 with order no. 1206.3216.

If the solid state disk is exchanged between FSWs with different types of CPU boards the screen resolution is only 800x600 and a "Drive Access Error" will be displayed from the firmware. Please switch off the device and change back to the solid stated drive which fits to the CPU board. The device will boot as usual.

1.6 Modifications to the Documentation

1.6.1 FSW-K6: Information about Segmented Capture Buffer

During operation of the Segmented Capture acquisition mode, the following status messages may appear:

1) "Segmented Capture: Last Segments truncated. Please reduce segment length."
This message appears if the end of a segment occurred very close to the successive trigger event (e.g. within 2 µs). In this case a merge of segments will occur. The timestamp information remains correct for this data.
However more data is stored from the time "between" the merged segments which is then truncated from the last segments in order not to exceed the allocated buffer size. This may potentially result in fewer than the requested number of events being captured.
Reduce the segment length to avoid this behavior.

2) "Segmented Capture: Timestamps inconsistent. Please reduce pre-trigger time."
This message appears if a large pre-trigger time is used (negative trigger offset) such that multiple trigger events occur with the pre-trigger interval. In this case an exact allocation of timestamps to segments is not possible.
Reduce the pre-trigger time to avoid this situation.

During operation of the Segmented Capture acquisition mode the following should be considered when using Gauss Filters:
Gauss filters with a 3 dB bandwidth of 50 MHz and above use more than 160 MHz of I/Q bandwidth if a FSW-B320 option is installed.

During segmented capture operation these filters are limited to 160 MHz of I/Q bandwidth which results in increased system rise time (up to an additional 3 ns) compared to the non-segmented B320 measurement.

2 Firmware Update

The firmware update file for the R&S FSW is one file including the main firmware version number e.g. FSWSetup_V1.60.exe. It will be referred as FSWSetup.exe later in the text. The file can be found on Rohde & Schwarz web page

2.1 Performing the Firmware Update on the Instrument

There are three ways to make the setup FSWSetup.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 FSW.

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

1. Connect the R&S FSW 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 FSW press the hard key “Setup” and then the soft key “Network + Remote”. The IP address consists of 4 numbers between 0 and 255.
4. Login to the instrument (user name: “instrument” and default password “894129”).
5. Copy the FSWSetup.exe from your PC to a new folder e.g. C:\FWUpdate.
6. You can now access this directory with the FSWSetup.exe from the R&S FSW analyzer firmware.

Using a network drive:

1. Connect your R&S FSW to your LAN, and establish a connection to one of your servers. (Please ask the local IT administrator for support)
2. Copy the FSWSetup.exe from your PC to a directory on this server
3. You can now access the directory with the FSWSetup.exe from the R&S FSW 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" hard key, then the soft key “System Config”, and select the tab “Firmware Update”.
   A file browser is displayed to select the proper FSW*.exe setup file. Change the path to the drive and directory which you prepared in the step before (USB stick

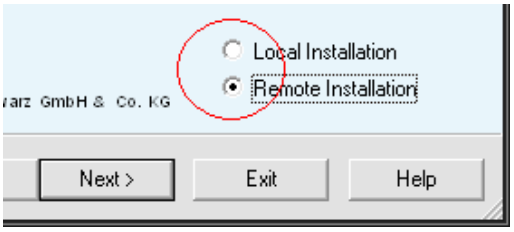
directory, remote PC directory or directory on a server) and close the dialog with the “Install” button.

3. Press the "Next" button to come to the selection of the firmware packages. By default all application should be installed. Ensure that the applications needed are selected.
4. Press the "Install" button.
   The firmware will be 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" hard key, the soft key "Alignment" and then press the button "Start Self Alignment" to invoke the alignment procedure.

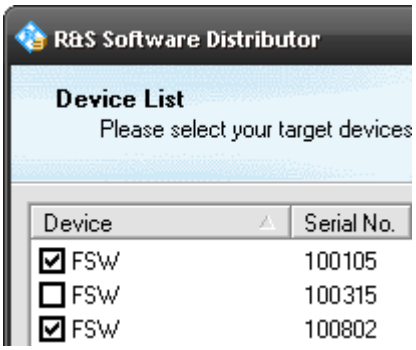
2.2 Performing the Firmware Update from a Windows PC

If the firmware version 1.10 or newer is installed on the instrument 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 FSWSetup.exe on your PC.
2. Select Remote Installation and click the button Next.



3. Select the Packages which shall be installed and click the button Next.
   HINT FOR FIRE WALL USERS: The FSWSetup.exe is communicating with the instruments via LAN. Therefore it is necessary that the FSWSetup.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

Please 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. Additional help will be displayed after clicking the button "Help" and further options are available by clicking the button "Options".
6. Start the installation by selecting "Install"
7. 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

With firmware version V1.41 or higher, the analyzer may be operated with or without administrator rights. Some administrative tasks (e.g. LXI functions or network configuration) do require administrator rights. Since firmware V1.60 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 Quick Start Manual of the FSW.

2.4 Installing Firmware Options

2.4.1 Firmware options included in basic instrument

The R&S FSW-K7, R&S FSW-K33 and R&S FSW-K54 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 FSWSetup.exe File

The R&S FSW-K6, R&S FSW-K10, R&S FSW-K17, R&S FSW-K30, R&S FSW-K40, R&S FSW-K60, R&S FSW-K70, R&S FSW-K72/73, R&S FSW-K76/77, R&S FSW-K82/83, R&S FSW-K84/85, R&S FSW-K91 and R&S FSW-K100/101/102/104/105 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 the FSW-K91p, FSW-K91n and FSW-K91ac are integrated within FSW-K91 and are activated by their own key code. The functionality of the FSW-K60C and FSW-K60h are integrated within FSW-K60 and are activated by their own key code.

The R&S FSW Signal Analyzer Firmware V2.00 is compatible to the following options:

FSW-K6	FSW-K10	FSW-K17	FSW-K30	FSW-K40	FSW-K60/ K60C/K60H	FSW-K70
V2.00	V2.00	V2.00	V2.00	V2.00	V2.00	V2.00

FSW-K72 FSW-K73	FSW-K76 FSW-K77	FSW-K82 FSW-K83	FSW-K84 FSW-K85	FSW-K91/ K91p/K91n /K91ac	FSW-K100/ K101/K102/ K103/K104/ K105
V2.00	V2.00	V2.00	V2.00	V2.00	V2.00

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" hard key.
2. Go to the tab “Versions + Options”
3. Press the button "Install Option".
   A dialog box is displayed.
4. Enter the option key number using the keypad.
5. Press "ENTER".
   After a successful validation the message "Option Key valid" 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" hard key.
2. Go to the tab “Versions + Options”
3. Press the button "Install Option by XML".
   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 message "Option Key valid" 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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