

R&S®FSVA3000/FSV3000

Signal and Spectrum Analyzer

Release Notes

Firmware Version V1.70

These Release Notes apply to the following models of the R&S®FSV3000 and R&S®FSVA3000 Signal and Spectrum Analyzers:

R&S®FSV3004	order no. 1330.5000K04
R&S®FSV3007	order no. 1330.5000K07
R&S®FSV3013	order no. 1330.5000K13
R&S®FSV3030	order no. 1330.5000K30
R&S®FSV3044	order no. 1330.5000K43

R&S®FSVA3004	order no. 1330.5000K05
R&S®FSVA3007	order no. 1330.5000K08
R&S®FSVA3013	order no. 1330.5000K14
R&S®FSVA3030	order no. 1330.5000K31
R&S®FSVA3044	order no. 1330.5000K44

© 2022 Rohde & Schwarz GmbH & Co. KG
Muehldorfstr. 15, 81671 Munich, Germany
Phone: +49 89 41 29 - 0
E-mail: info@rohde-schwarz.com
Internet: <http://www.rohde-schwarz.com>

Subject to change – Data without tolerance limits is not binding.
R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG.
Trade names are trademarks of the owners.

1178.9378.02 | Version 01 | R&S®FSVA3000/FSV3000 |

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®FSVA3000/FSV3000 is abbreviated as R&S FSVA3000/FSV3000.



Contents

1	Information on the current version and history	3
1.1	New functions	3
1.2	Modified functions	5
1.3	Improvements	6
1.4	Known issues.....	8
1.5	Optimizing 10 Gbit LAN Speed (R&S FSV3-B6).....	10
1.6	Windows 10	10
2	Modifications to the documentation	11
3	Firmware update	12
3.1	Validity information	12
3.2	Update information	12
3.3	Performing the Firmware Update on the Instrument	12
3.4	Performing the Firmware Update from a Windows PC	14
3.5	Installing firmware options	15
3.5.1	Firmware options included in basic instrument.....	15
3.5.2	Other firmware options within the FSV3000setup.exe File.....	15
3.5.3	Enabling options by entering option key codes	15
4	Customer support.....	17

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 V1.70:

Version	Function
V1.70	<p>R&S FSV3-K553 "External Frontend Control":</p> <p>Allow up to two simultaneous LAN connections to one External Frontend.</p> <p>Firmware version V1.70 includes the External Frontend microcontroller firmware V2.1.6. Please note: Incompatible firmware versions installed on analyzer and the External Frontend will lead to a deactivated connection to the External Frontend. Please update the External Frontend firmware in this case (dialog "input source – external frontend – global config – FW update").</p> <p>FE50DTR Simultaneous Mode requires SMM/SMW Firmware Version > 5.00.044.38.</p> <p>Support for new revisions of External Frontend synthesizer boards:</p> <ul style="list-style-type: none"> FE44S_Synthesizer, part number 1338.6570.02, revision ≥ 3.11. FE50DTR_Synthesizer, part number 1338.6570.02, revision ≥ 3.11. <p>See table "Setup – System Config – Hardware Info", column "Rev".</p>
V1.70	R&S FSV3-K18: Support of time trigger, auto level and power sensor. Automatic correction of input/output levels. Increased capture length (depending on system configuration).
V1.70	R&S FSV3-K7: Support of Settling Time Measurements.
V1.70	Support of R&S FS-SNS67 smart noise source for noise figure and gain measurement.
V1.70	Support for Three-Path Diode Power Sensor R&S NRP67SN-V, order no. 1424.6415.02.
V1.70	User-defined parameter coupling additionally supports coupling of reference level and center frequency with an R&S SMBV100B (dialog "Setup – Parameter Coupling – Generator Coupling").
V1.70	New SCPI command to change the frequency indication between center/span and start/stop: <code>SENSe:FREQuency:ANNotation</code> .
V1.70	SCPI command <code>:LAYout:WINDow<n>:TYPE?</code> available now for spectrum mode, I/Q analyzer mode and analog demodulation.
V1.70	<p>R&S FSV3-K144/-K145/-K147/-K148:</p> <p>Signal demodulation and analysis in line with TS38.211 V16.7.0.</p> <p>PUCCH format 3 and 4.</p> <p>Optionally allow PDSCH in unused CORESET CCEs.</p> <p>Optional transport block size calculation including allocation gaps.</p>

V1.70	R&S FSV3-K980: HUMS history export: Additional tracking of the utilization of bandwidth extensions, frequency ranges, relay switching cycle counters, external reference settings.
V1.70	R&S FSV3-K70: Support for external mixers (R&S FSV3-B21) added.
V1.70	R&S FSV3-K70: Configuration tool for DVB-RCS2 measurements available (linear modulation reference waveforms).
V1.70	R&S FSV3-K54: Additionally: linear analog sweep with CISPR detectors, and logarithmic analog sweep with CISPR and classical detectors.

New function of firmware V1.60 SP1:

Version	Function
V1.60 SP1	Support for CPU boards with part numbers: <ul style="list-style-type: none"> • 1206.3974.00 • 1206.3980.00 • 1206.3997.00

New function of firmware V1.60:

Version	Function
V1.60	New option R&S FSV3-B21 "Connections Ext. Mixers" supports external mixers for the following applications: <ul style="list-style-type: none"> • Spectrum • I/Q Analyzer • Analog Modulation Analysis (R&S FSV3-K7)
V1.60	Support for floating licenses on R&S FSV3000 and R&S FSV3000. Requires options R&S FSV3-FL or R&S FSV3-LP-FL. Please see the R&S FSV3000 or R&S FSV3000 datasheet for detailed list of available floating options and ordering information.
V1.60	Gated sweep now supports the traditional sweep method in addition to the previously available FFT sweep.
V1.60	Support for new options: R&S FSV3-K18M: "Memory Polynomial DPD" R&S FSV3-K54C: "CISPR Calibration for K54" R&S FSV3-K91BE: "WLAN 802.11be Measurements"
V1.60	Support for Russian user interface language (menu Setup – System Configuration – Language)
V1.60	A new function allows adding trace specific labels (dialog "Trace – Trace Config - Trace Label")
V1.60	R&S FSV3-K6: Support for analysis of pulse widths up to 25 million samples.
V1.60	R&S FSV3-K60: Support for Long Capture Buffer mode which allows analysis of the full installed IQ capture memory depth.

V1.60	R&S FSV3-K70: Support for external frontends R&S FE44S and R&S FE50DTR added.
V1.60	R&S FSV3-K106: Support NB-IoT Non-anchor carriers. CONFigure[:LTE]:TYPE <ANCHor NANChor>
V1.60	R&S FSV3-K553 "External Frontend Control": <ul style="list-style-type: none"> Extended support of network settings (e.g. static IP address of the frontend). The I/Q Analyzer application provides I/Q measurements with an I/Q bandwidth of up to 1 GHz using external frontends. Firmware version V1.60 includes the external frontend microcontroller firmware V2.0.4. Please note: Incompatible firmware versions installed on analyzer and the external frontend will lead to a deactivated connection to the external frontend. Please update the external frontend firmware in this case (dialog "input source – external frontend – global config – FW update").
V1.60	R&S FSV3-K144/-K145/-K147/-K148: Support for external frontends R&S FE44S and R&S FE50DTR added. Analysis of multiple CSI antenna ports added. Parallel processing of multi carrier analysis for increased analysis speed added. Power mode "Average active symbols" added. Bitstream format "Symbols" or "Bits" selectable. A new SCPI query returns all result summary entries in one response.

1.2 Modified functions

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

Version	Function
V1.70	Saving screenshots via SCPI: If the graphics format set via <code>HCOPY:DEVICE:LANGUage<n></code> differs from the format indicated by file type ending of the selected filename, the file is saved in the format of the file type ending.
V1.70	The R&S FSV3-B8E evaluation license key is supported now.
V1.70	RF attenuation is set to 75 dB during shutdown.
V1.70	R&S FSV3-K144/K145: Rename FR2 to FR2-1 according to 3GPP.
V1.70	R&S FSV3-K980: Link to HUMS added to instrument web browser interface.
V1.70	R&S FSV3-K54: EMI measurement FFT sweep: Sweep times leading to interruption in signal acquisition within one FFT segment are not possible anymore.
V1.60SP1	R&S FSV3-B10: Generator control data for SMA100B were modified to fully support the TTL handshake.
V1.60	SCPI Recorder handles external reference settings.
V1.60	External trigger: increased timing accuracy.

V1.60	Gate mode "Edge" is automatically activated now when continuous gating is switched on.
V1.60	R&S FSV3-K144: Outputs payload bits also when CRC fails.
V1.60	R&S FSV3-K144: Increased upper/lower limit of the frequency error vs. symbol/subframe result displays.
V1.60	R&S FSV3-K148: Changed wording "DMRS-Downlink-r16" to "DMRS-Downlink according to 38.211".
V1.60	R&S FSV3-K144: A multi carrier channel spacing less than the nominal channel spacing can now be configured.
V1.50SP1	Added R&S FSV3-B8E support for R&S FSV3000 instrument models.
V1.50	Channel power ACLR measurement – multi standard radio (MSR): The display format for the MSR ACLR weighting filter (alpha) indication is changed from floating point format to fixed point format.
V1.50	R&S FSV3-K30: If an R&S smart noise source (FS-SNS) is connected to the device, the data of this FS-SNS is now displayed in the ENR/Temp settings dialog.
V1.50	R&S FSV3-K54: FFT sweep: timing modified for FFT sub spans to support longer continuous observation times.
V1.50	R&S FSV3-K70: In order to better visualize the symbol transitions, the sample points are now connected in density trace mode for result type 'Vector I/Q'.
V1.50	R&S FSV3-K144: The frequency error limit check result is now also indicated for Min and Max in the result summary.
V1.50	R&S FSV3-K144: Frequency error limit check can be optionally switched off.

1.3 Improvements

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

Improvements of firmware V1.70:

since	Function
V1.60	Pressing enter in file dialogs did not save or open the file. This issue is solved.
V1.60	Rohde & Schwarz web control file upload failed for file sizes > 8 MB. This issue is solved.
V1.10	R&S FSV3-B10: External tracking generator using TTL mode: Signal dropouts may be visible for certain instrument settings, e.g. number of sweep points, resolution bandwidth, start frequency, stop frequency. This issue is solved.

Hint: In case of remaining issues an update of the “B5 - Additional interface” board may help if the board revision is ≤ 3.01 (see table “Setup – System Config – Hardware Info”, column “Rev”).

Improvements of firmware V1.60 SP1:

since	Function
V1.60	I/Q analyzer: A click on the dialog “IQ Export – File Explorer” had no effect. This issue is solved.
V1.05	The CCDF measurement shows a wrong trace scaling if a transducer is switched on. . This issue is solved.

Improvements of firmware V1.60:

since	Function
V1.50	R&S FSV3-K100: Decoded bitstream for PDSCH is not available in Channel Decoder Result. The issue is solved. Note: PDSCH Subframe Configuration Detection has to be set to PDCCH Protocol, since the PDSCH Channel Coding parameters are supposed to be extracted from the PDCCH Protocol.
V1.05	The fan control may report a problem and initiate a shutdown in rare cases. This issue is solved.
V1.50	Message “waiting for trigger” indicates a missing trigger event. This message was not removed in rare cases.

Improvements of firmware V1.50SP1:

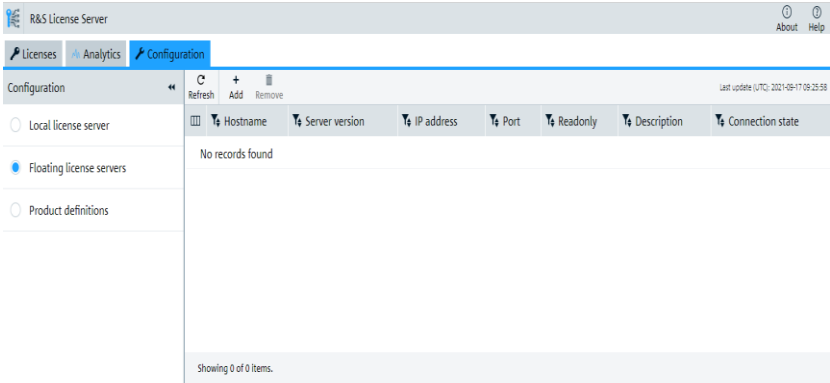
since	Function
V1.40	Under specific conditions directly after power on, the analyzer display showed a frozen trace in continuous sweep mode. This issue has been observed in rare cases at instruments without option B114 “Enhanced computing power”. This issue is solved.

Improvements of firmware V1.50:

since	Function
V1.40	R&S FSV3-K18: Improved algorithm for compression point measurement.
V1.40	R&S FSV3-K18D: new default value for power linearity tradeoff and modified algorithm. New default value of 50% provides same results as previous versions with 100%.

1.4 Known issues

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

since	Function
V1.70	R&S FSV3-K18: Zeroing, Meas->Ref, and Unit settings currently not available in power sensor mode.
V1.60	R&S FSV3-K980: For very large HUMS database sizes, the remote commands DIAGnostic:HUMS[ALL]? and DIAGnostic:HUMS:UTILization:HISTory? may fail. In this case, use SNMP or REST (Representational State Transfer).
V1.60	<p>The floating license server has to be configured by the instrument's webpage with firmware version V1.60.</p> <p>Open the license server web page with your own browser with the instrument's IP address followed by a colon and the number 9444, e.g. http://10.11.12.13:9444, select tab "Configuration – Floating license servers" and enter the related data.</p>  <p>Changing the configuration by using the instrument's dialog will show an error message.</p>
V1.60	<p>R&S FSV3-K553:</p> <p>When trying to connect to an external frontend providing an invalid host name or aborting (e.g. setting connection state to OFF) an ongoing connection attempt, the application becomes unresponsive for a few seconds.</p>
V1.60	<p>R&S FSV3-B21:</p> <p>Firmware version V1.60 fully supports the applications "Spectrum", "I/Q Analyzer" and "Analog Modulation Analysis".</p> <p>Although activation dialogs for external mixers may be accessible in other applications, this feature is not yet fully supported and tested in these applications.</p>
V1.50	<p>The License Manager of the instrument may indicate the following message.</p> <div style="border: 1px solid gray; padding: 5px; background-color: #f0f0f0;"> <p>Sorry, your browser does not support essential features required for running the R&S License Server Web-UI.</p> <p>We recommend to use any of the latest versions of Chrome, Firefox, Safari, Edge or Opera.</p> <p>Try to proceed anyway</p> </div> <p>Work around:</p> <p>Open this page on your own browser with the instrument's IP address followed by a colon and the number 9444, e.g. "10.11.12.13:9444".</p>

- V1.30 R&S FSV3-K6:
- When applying a trigger offset, the selected analysis bandwidth may be wider than expected:
- 200 MHz in case that the bandwidth was set to 160 MHz
 - 400 MHz in case that the bandwidth was set to 320MHz or 250 MHz
- Other analysis bandwidth settings are not affected.
- There are two possibilities to avoid this issue:
- adjust the trigger offset before setting the analysis bandwidth.
 - set the trigger offset in two steps: set it first to any value $\neq 0$ s (example 100 ns) and in a second step to the desired value.

V1.10 For IQ-Export > 600 Mio. samples no Iq.tar preview is available and a Windows message warning about low memory may be displayed. This issue only occurs with option R&S FSV3-B114 Enhanced Computing Power.

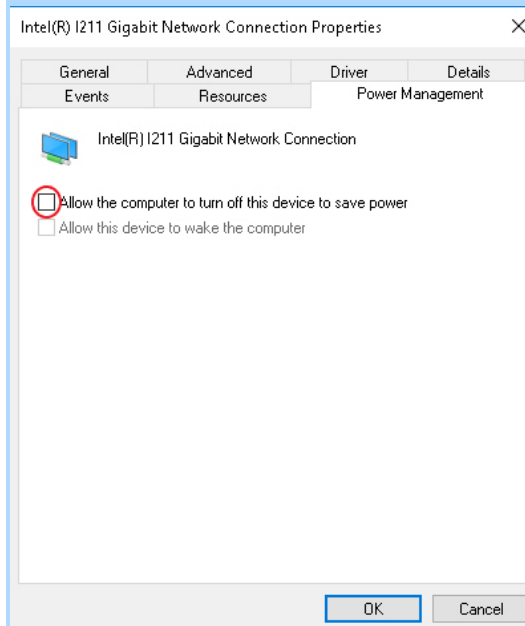
V1.10 License key installation via the R&S License Manager webpage may show a red message in the last line. Nevertheless, the license key is properly installed on the device, which can be seen after a reboot.

V1.10 R&S FSV3-K91/n/ac/ax: The R&S FSV3-K91 does not yet support the Auto Reference Level functionality. Before using remote control scripts developed for other R&S spectrum analyzers, the SCPI command [:CONF:POW:AUTO] must be commented out.

V1.10 A message box "Warning: Missing smartcard or smartcard not initialized" may appear during startup of the instrument in rare cases.

In this case, please switch the instrument off and on using the power switch on the rear side of the instrument or disconnect/reconnect the power line to solve this issue.

V1.00 In combination with a certain LAN-switch (SMC Switch 210) the VISA remote connection to the R&S FSV3000 sometimes breaks. If this happens, the power save mode in the configuration of the Intel I211 network controller must be deactivated on the R&S FSV3000:



1.5 Optimizing 10 Gbit LAN Speed (R&S FSV3-B6)

To obtain optimum LAN speed performance using the R&S FSV3-B6 (10Gbit/s LAN Interface), driver settings have to be adjusted. Here is a recommendation on how to adjust the settings for optimized speed:

1. Open Windows “Start Menu”.
2. Search for “Network and Sharing Center”.
3. Select “Network and Sharing Center”.
4. Select “Change adapter settings”.
5. Select “Ethernet 3 - Intel(R) Ethernet Converged Network Adapter X550-T1”
6. Select “Configure”
7. Select Tab “Advanced”
8. Adjust the following settings:
 - “Interrupt Moderation” > Value: “Enabled”
 - “Jumbo Packet” > “9014 Bytes”
 - “Maximum Number of RSS Queues” > “16 Queues”
 - “Performance Options” > “Properties”
 - “Interrupt Moderation Rate” > “Off”
 - “Receive Buffers” > “4096”
 - “Transmit Buffers” > “16384”

1.6 Windows 10

The R&S FSV3000/R&S FSVA3000 uses the Windows 10 IoT Enterprise LTSCB operating system, which is the embedded version of Windows 10 with long term support for Windows patches.

2 Modifications to the documentation

The current documentation is up-to-date.

3 Firmware update

3.1 Validity information

The R&S FSV3000 installer is valid for:

Device	Order Number
R&S®FSV3004	1330.5000K04
R&S®FSV3007	1330.5000K07
R&S®FSV3013	1330.5000K13
R&S®FSV3030	1330.5000K30
R&S®FSV3044	1330.5000K43
R&S®FSVA3004	1330.5000K05
R&S®FSVA3007	1330.5000K08
R&S®FSVA3013	1330.5000K14
R&S®FSVA3030	1330.5000K31
R&S®FSVA3044	1330.5000K44

3.2 Update information

The firmware update file for the R&S FSVA/R&S FSV is one file including the firmware version number e.g. FSV3000_V1.30.exe. It is referred to as FSV3000Setup.exe later in the text. The file can be found on the Rohde & Schwarz web page <https://www.rohde-schwarz.com>.

3.3 Performing the Firmware Update on the Instrument

There are three ways to make the FSV3000Setup.exe setup file visible to the device:

Using a memory stick:

1. Copy the file to a directory of the memory stick.
2. Insert the memory stick into one of the USB sockets of the R&S FSV3000.

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

1. Connect the R&S FSV3000 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. The IP address consists of 4 numbers between 0 and 255.
(To get the TCP/IP address of the R&S FSVA/R&S FSV, press the "Setup" key, then select "Network + Remote".)
4. Ensure that the "local resources" > "drives" option is selected.
5. Press the "Connect" button.
6. Log on to the instrument (user name: "instrument" and default password "894129").
7. Copy the FSV3000Setup.exe from your PC to a new folder, e.g. C:\FWUpdate.
8. You can now access this directory with the FSV3000Setup.exe from the R&S FSVA/R&S FSV analyzer firmware.

Using a network drive:

1. Connect your R&S FSVA/R&S FSV to your LAN and establish a connection to one of your servers. (Ask the local IT administrator for support.)
2. Copy the FSV3000Setup.exe from your PC to a directory on this server.
3. You can now access the directory with the FSV3000Setup.exe file from the R&S FSVA/R&S FSV analyzer firmware.

Performing the update on the instrument:

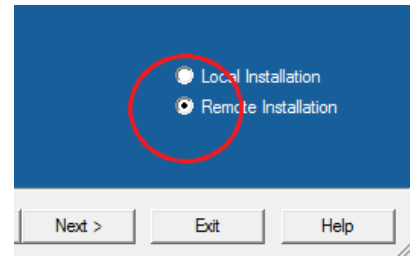
Update the firmware by performing the following steps:

1. Switch the instrument on and wait until the analyzer has resumed operation.
2. Press the "SETUP" key, then select "System Config" > "Firmware Update" tab.
3. A file browser is displayed to select the proper FSV3000*.exe setup file.
4. 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).
5. Select "Install" to close the dialog.
6. Select "Next" to display the selection of the firmware packages. By default, all applications are installed. Ensure that the required applications are selected.
7. Select "Install".
8. 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.
9. Press the "SETUP" key, then select "Alignment" > "Start Self Alignment" to invoke the alignment procedure.

3.4 Performing the Firmware Update from a Windows PC

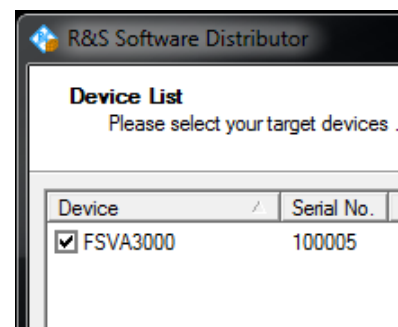
The R&S FSVA/R&S FSV firmware can also be uploaded without using a memory stick or a network drive. Just a LAN connection from the instrument and a Windows PC is necessary.

1. Run `FSV3000Setup.exe` on your PC.
2. Select "Remote Installation".
3. Select "Next."
4. Select the packages to install.
5. Select "Next".



Note:

FOR FIREWALL USERS: The `FSV3000Setup.exe` communicates with the instruments via LAN. Therefore, the `FSV3000Setup.exe` file must pass the firewall. Add it to the firewall rules, then restart the scan using "Rescan".



6. The setup procedure scans your LAN subnet and displays all found instruments
7. Select the instruments you want to update.

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 are included!

8. Select "Help" to display additional help.
Select "Install" to start the installation.
9. Confirm the message to reboot the instrument to activate the firmware update.
The instrument then restarts automatically.
10. After the restart, the firmware installation is complete and the "UNCAL" flag appears. A self alignment is necessary.
11. Press the "SETUP" key, then select "Alignment" > "Start Self Alignment" to invoke the alignment procedure.

3.5 Installing firmware options

3.5.1 Firmware options included in basic instrument

The R&S FSV3-K7, R&S FSV3-K33 and R&S FSV3-K544 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 Other firmware options within the FSV3000setup.exe File

The R&S FSV3-K6, R&S FSV3-K10, R&S FSV3-K18, R&S FSV3-K30, R&S FSV3-K40, R&S FSV3-K60, R&S FSV3-K70, R&S FSV3-K72/73, R&S FSV3-K91, R&S FSV3-K100/101/102/104/105/106, R&S FSV3-K144/145/147/148 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.

NOTICE

The functionality of R&S FSV3-K18D is integrated within R&S FSV3-K18 and is activated by its own key code.

The functionality of R&S FSV3-K70M, R&S FSV3-K70P are integrated within R&S FSV3-K70 and are activated by their own key code.

The functionality of the R&S FSV3-K91P, R&S FSV3-K91N, R&S FSV3-K91AC, R&S FSV3-K91AX and R&S FSV3-K91BE are integrated within R&S FSV3-K91 and are activated by their own key code.

The functionality of the R&S FSV3-K60C and R&S FSV3-K60H are integrated within R&S FSV3-K60 and are activated by their own key code.

3.5.3 Enabling options by entering option key codes

NOTICE

Skip this section if the option key was entered once.

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

If an 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. Open a Remote Desktop Connection to the instrument via ethernet or connect an external monitor and keyboard/mouse]

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

Installation of options via XML-file

1. Open a Remote Desktop Connection to the instrument via ethernet or connect an external monitor and keyboard/mouse]
2. Select "SETUP".
3. Go to the tab "Versions + Options"
4. Press the button "Install Option by XML".
A file browser is displayed.
5. Select the path to the XML file (e.g. network drive or USB stick)
6. 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.

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:



QR code to the Rohde & Schwarz support page