

Release Notes

Revision: 16

R&S® FSW Signal and Spectrum Analyzer

Firmware Release V1.51

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

Features of Firmware V1.51:

- FSW-K6: A new “Averaging Window” parameter is now available for increased stability of the point-in-pulse measurements.
- FSW-K6: A new “Pulse Phase (Wrapped)” display is now available which is useful e.g. for Barker Code measurements.
- FSW-K91, -K91n, -K91ac: Support of Bit stream measurement
- FSW-K91, -K91n, -K91ac: Support of statistics over multiple sweeps
- FSW-K91, -K91n, -K91ac: Results Summary Global and Results Summary Details displayed can now be configured as to which results are displayed.

Features of Firmware V1.50:

- Support for FSW-K10 GSM Measurement Application
- Support for FSW-K100 EUTRA/LTE FDD Downlink Measurement Application
- Support for FSW-K104 EUTRA/LTE TDD Downlink Measurement Application
- Support for FSW-B8 1313.2464.26 for FSW8/13/26
- Emulation for R&S FSEA/FSEB/FSEM/FSEK
- Multi-Standard Radio Analyzer: Support of error messages which indicates wrong configuration of the MSRA Master or an Applications
- IQ Analyzer/Multi-Standard Radio Analyzer: In spectrum diagram the Analysis Bandwidth is now visualized
- FSW-K7: Support of standards for convenient pre-configuration
- FSW-K17: New result diagram Gain
- FSW-K17: Support of Auto Level function
- FSW-K30: Uncertainty calculator for noise figure measurements
- FSW-K30: New result window Current Values added
- FSW-K70: Now also available in MSRA Mode
- FSW-K70: New measurements: Spectrum and Statistics for Frequency of Capture Buffer

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1 Revision History

Date	Rel. Note rev.	Changes
10. August 2012	16	First version for FSW firmware V1.51

2 Installation Information

2.1 Firmware Update

The firmware update file for the R&S FSW is one file including the main firmware version number e.g. `FSWSetup_V1.10.exe`. It will be referred as `FSWSetup.exe` later in the text. The file can be found on Rohde & Schwarz web page.

2.1.1 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 you 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 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 2.1.1 (USB stick directory, remote PC directory or directory on a server) and close the dialog with the "Install" button.

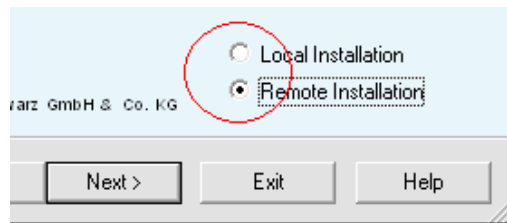
3. Press the "Next" button to come to the selection of the firmware packages. By default all application should be installed. Ensure that the applications needed are selected.
Press the "Install" button.

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. Press the "SETUP" hard key, the soft key "Alignment" and then press the button "Start Self Alignment" to invoke the alignment procedure.

2.1.2 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.

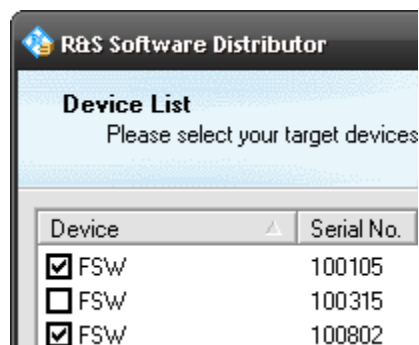
1. Run `FSWSetup.exe` on your PC.
2. Select Remote Installation and click the button Next.



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.



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)

2.1.3 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. a firmware update or a LXI functions or network configuration) do require 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.

2.2 Installing Firmware Options

2.2.1 Firmware R&S FSW-K7 Analog Demodulation

The R&S FSW-K7 application software package is included in the basic instrument firmware. Therefore it does not have a separate item in the installer to be selected.

2.2.2 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-K70, R&S FSW-K72/73, R&S FSW-K82/83, R&S FSW-K84/85, R&S FSW-K91 and R&S FSW-K100/104 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-K91n and FSW-K91ac are integrated within FSW-K91 and is activated by their own key code.

The R&S FSW Signal Analyzer Firmware V1.51 is compatible to the following option:

FSW-K6	FSW-K10	FSW-K17	FSW-K30	FSW-K40	FSW-K70
V1.51	V1.51	V1.51	V1.51	V1.50	V1.51

FSW-K72 FSW-K73	FSW-K83 FSW-K84	FSW-K85 FSW-K86	FSW-K91 FSW-K91N FSW-K91AC	FSW-K100 FSW-K104
V1.51	V1.51	V1.51	V1.51	V1.51

2.2.3 Enabling Options by Entering Option Key Codes



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 New Functions

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

Version	Function
V1.51	Remote command <code>SOURCE:TEMPERATURE:FRONTend?</code> to read out the temperature of the frontend board.
V1.51	FSW-K6: A new "Averaging Window" parameter is now available for increased stability of the point-in-pulse measurements.
V1.51	FSW-K6: A new "Pulse Phase (Wrapped)" display is now available which is useful e.g. for Barker Code measurements
V1.51	FSW-K10: Indication of Burst Type and Modulation in Channel Bar added.
V1.51	FSW-K30: Uncertainty calculator: new result parameter "meas offset" for uncalibrated measurements (2nd stage correction = off)
V1.51	FSW-K91, -K91n, -K91ac: Support of Bit stream measurement
V1.51	FSW-K91, -K91n, -K91ac: Support of statistics over multiple sweeps.
V1.51	FSW-K91, -K91n, -K91ac: Results Summary Global and Results Summary Details displayed can now be configured as to which results are displayed.
V1.50	Support for FSW-K10 GSM Measurement Application
V1.50	Support for FSW-K100 EUTRA/LTE FDD Downlink Measurement Application
V1.50	Support for FSW-K104 EUTRA/LTE TDD Downlink Measurement Application
V1.50	Support for FSW-B8 1313.2464.26 for FSW8/13/26
V1.50	Emulation for R&S FSEA/FSEB/FSEM/FSEK (added in the dialog to the language list)
V1.50	Multi-Standard Radio Analyzer: Support of error messages which indicates wrong configuration of the MSRA Master or an Applications
V1.50	IQ Analyzer/Multi-Standard Radio Analyzer: In spectrum diagram the Analysis Bandwidth is now visualized
V1.50	FSW-K6: Added "Auto Scale Once" button to the Y Scaling dialog for trace displays and an "Auto Scale Window" Softkey to the AMPT and AUTO menu. This function is available when continuous auto-scaling is set to "Off". It performs a single automatic Y-scaling operation for the selected result display.
V1.50	FSW-K7: Support of standards for convenient pre-configuration
V1.50	FSW-K17: New result diagram Gain showing the ratio between measured magnitude and reference magnitude
V1.50	FSW-K17: Support of Auto Level function
V1.50	FSW-K30: Uncertainty calculator for noise figure measurements
V1.50	FSW-K30: New result window Current Values added
V1.50	FSW-K70: Now also available in MSRA Mode FSW-K70: Symbol Rate Error and Compensate for Symbol Rate Error.
V1.50	FSW-K70: New measurements: Spectrum and Statistics for Frequency of Capture Buffer
V1.50	FSW-K70: Symbol Rate Error and Compensate for Symbol Rate Error

Version	Function
V1.50	FSW-K70: The Symbol Rate Error displayed for certain modulation schemes is derived by a coarse estimation, so it should be used for long result ranges and large expected symbol rate errors only.
V1.50	FSW-K70: The "selected result range" in the capture buffer display can be moved via the touch screen in the diagram
V1.50	FSW-K70: some sample files for the I/Q import within the VSA are located on the instrument under C:\R_S\instrument\user\vsa\DemoSignals. These can be used to familiarize yourself with the VSA measurement application.
V1.50	FSW-K91, -K91n, -K91ac: Support of PvT Full PPDU measurement
V1.42	Support for FSW-K91 802.11a Measurements Support for FSW-K91n 802.11n Measurements. Support for FSW-K91ac 802.11ac Measurements.
V1.41	Support for FSW-B17 Digital Baseband Interface (In order to configure a R&S EX-IQ Box order number 1409.5505K04 it is possible to install the latest R&S DiglConf software on the FSW and use the USB connection between FSW and EX-IQ Box. Please use DiglConf Version 2.20.360.86Build170 or newer. For the other R&S EX-IQ Box order number 1409.5505.02 the USB control from Windows7 systems (as the FSW) is not available. Please use either a PC or laptop with WinXP and the DiglConf version from above or use the R&S SMU to control the EX-IQ Box.
V1.41	Support for FSW-K17 Multi-Carrier Group Delay Measurements
V1.41	Support for FSW-K70 Vector Signal Analysis
V1.41	Support for Multi-Standard Radio Analyzer (allows to capture with a high analysis bandwidth I/Q data once, which then can be analyzed with the I/Q analyzer, FSW-K7 Analog Demodulation, FSW-K72 3GPP BTS, FSW-K82 cdma2000 BTS or FSW-K84 1xEV-DO BTS to examine cross talks between technologies having time correlated signals) The MSRA is a standard function of the analyzer, thus an additional option license is not required. If the applications FSW-K7/K72/K82/K84 are installed on the device they are also include the support for MSRA.
V1.41	SEM supports multi-standard radio (MSR) mode according to 3GPP TS 37.141 for all 3 Band Categories
V1.41	SEM supports maximum function for single limit points
V1.41	Noise Cancellation: Support noise cancellation for all 6 traces and in SENSE:LIST for a three detector values.
V1.41	IQ-Analyzer: Support for IF output
V1.41	Tab bar now supports drop down list on the right to easily access channels which are currently not visible on the bar
V1.41	Useful windows applications are now pinned to the taskbar
V1.41	NormalUser account (without administrator rights) supported
V1.41	FSW-K6: ASCII Table Export function added for saving the Pulse Results table to file in CSV format.
V1.41	FSW-K40: Added Spur List display
V1.41	FSW-K40: Added AM rejection to see only PM (working in IQ FFT mode only)
V1.41	FSW-K40 Green bars indicate current measured half decade; red bars indicate e.g. "IFOVLD" in this segment

4 Modified Functions

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

Version	Function
V1.51	Bandpower Marker: Formerly the bandpower span of a marker was reduced, if the range is outside the frequency span. Now the bandpower marker result is marked invalid and the bandpower span is preserved for easier usage.
V1.50	FSW-K10: In MSRA mode Multi Carrier BTS defaults to On and Capture Time defaults to 20 ms.
V1.51	FSW-K82/K84/K72/K100/K104: In MSRA mode Multicarrier filter defaults to On.
V1.51	FSW-K91, -K91n, -K91ac: Results Summary Global and Results Summary Details displayed can now be configured as to which results are displayed.
V1.51	FSW-K91, -K91n, -K91ac: In Result Summary, the Mean EVM results are computed as the the mean of the EVM results for each PPDU.
V1.51	FSW-K91, -K91n, -K91ac: Channel Bandwidth selection now reflects the installed hardware availability.
V1.50	FSW-K6: Modified SCPI commands which return a string value to always return the short form.
V1.50	FSW-K17: Enhanced the 'Multi Carrier Settings' dialog to show the input of Carrier Spacing, Number of Carriers and Span in a formular
V1.50	FSW-K40: Tracked frequency and level is color-coded in the header
V1.50	FSW-K40: More RBW filters (stepping 2 and 5) available
V1.50	FSW-K70: The value for alpha/BT of filters now is accepted by all unit keys on the front panel of the instrument
V1.50	FSW-K82/K84: The 'Trigger to Frame' value in the Result Summary Measurement is now also shown in the trigger mode 'Free Run'.
V1.50	FSW-K84/K85: 'YIG Bypass' is displayed in the channel bar.
V1.41	IQ Analyzer: IQ-Analyzer: Maximum Sample Rate increase to 10GHz
V1.41	Printing: The support for EMF and WMF file is removed from the print setup dialog. Please use more modern format like PNG or JPEG. (for remote control the older formats are still supported for compatibility reasons.)
V1.41	FSW-K40: Trace is updating continuously per half-segment for long sweep times
V1.41	FSW-K40: Better performance in IQ FFT mode
V1.41	FSW-K40: More robustness against level and frequency changes during sweep

5 Improvements

The following table lists the improvements and indicates the version in which the issue could be observed for the first time:

Version	Function
V1.50	Print Color Dialog: After opening this dialog once, the default print color setup was changed. This issue is solved.
V1.50	ACLR measurement with Noise Cancellation: Improvements for 5 dB attenuation steps and for lower frequencies.
V1.50	Marker Dialog: In some situation some items of the marker dialog were grey. This issue is solved.
V1.50	After switching the RF attenuation from manual to auto the mixer level was sometimes not set optimal, This issue is solved.
V1.50	FSW-MSRA: The cyan colored lines indicating the occupied bandwidth of the applications sometimes have not been updated. In FSW-K10 the value is now always 200 kHz. This issue is solved.
V1.50	FSW-MSRA: Analysis Interval reading was missing in unfocused windows on print out.
V1.50	FSW-K10: Online help improved.
V1.50	FSW-K17: In some situations like after changing the center frequency the auto level could result in an non optimal level setup. This issue is solved.
V1.50	FSW-K70: Preset Channel now also works in MSRA mode
V1.41	FSW-K70: The Bit Error Rate measurement now also works for sequences longer than 2000 symbols
V1.50	FSW-K70: The Symbol Rate Error is only shown in the Result Summary, if "Compensate for Symbol Rate Error" is activated."
V1.50	FSW-K91, -K91n, -K91ac: With long capture times the constellation diagram could cause the display to be blank momentarily. This issue is solved
V1.50	FSW-K91, -K91n, -K91ac. Default value for Guard Interval Length now set to Auto First PPDU.
V1.50	FSW-K100/K104: The I/Q Import of I/Q data files failed in this applications. This issue is solved.
V1.50	FSW-K100/K104: Memory consumption of the application improved.

Improvements of previous firmware version:

Version	Function
V1.41	Spectrum/IQ-Analyzer/FSW-K6/K7/K17: In some situations the marker results in the upper right corner of the diagram were truncated. This issue is solved.
V1.41	IQ-Analyzer/FSW-K6/K7/K91: Using a reference level offset with sampling rates above 200 MHz results in a double calculation of the reference level offset. This issue is solved.
V1.41	IQ-Analyzer: For devices with 10 MHz IQ analysis bandwidth for some sampling rates the selectivity was not high enough. This issue is solved.
V1.10	Improved resolution for x-values in Marker Peak List ASCII Export for Zero Span.

Version	Function
V1.41	Spectrum/IQ-Analyzer/FSW-K6/K7/K17: In some situations the marker results in the upper right corner of the diagram were truncated. This issue is solved.
V1.41	IQ-Analyzer/FSW-K6/K7/K91: Using a reference level offset with sampling rates above 200 MHz results in a double calculation of the reference level offset. This issue is solved.
V1.41	IQ-Analyzer: For devices with 10 MHz IQ analysis bandwidth for some sampling rates the selectivity was not high enough. This issue is solved.
V1.41	Display of order and serial number of the front module controller corrected.
V1.41	FSW-K6: In the file produced by "ASCII Table Export", the "Values" property in the header information only shows the number of pulses measured from the last capture. The "Values" property now shows the total number of pulses recorded in the table over multiple captures.
V1.42	FSW-K91,-K91n, -K91ac: Measurement speed performance improved
V1.41	MSRA help know available from within the firmware.
V1.41	FSW-K70: For statistics measurements the oversampling could not be changed in the dialog. This issue is solved.

6 Known Issues

The following table lists the known issues and indicates the version in which the issue was observed for the first time:

Version	Function
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.
V1.50	FSW-K10: Power vs Time limit lines for AQPSK are according to 3GPP TS 45.005 V10.0.0. Update to current 3GPP specification version required.
V1.51	FSW-K91, -K91n, -K91ac: In Result Summary Global the PPDU Power and Crest Factor statistics is performed up to min('Evaluation Range No. of PPDU's to Analyze', Number of analyzed PPDU's in the last Magnitude Capture Memory).
V1.50	FSW-K91,-K91n, -K91ac: For CBW160MHz signals using 100ms capture time, performance drops might appear when using the Constellation, Constellation vs Carrier or FFT Spectrum result displays. Workaround: Decrease the capture time or the number of symbols for the PPDU's to be analyzed.
V1.50	FSW-K10: Switching from manual to auto grid scaling only takes effect with the next single sweep.
V1.50	FSW-K30: noise figure uncertainty is calculated for input attenuator = 0 dB
V1.42	FSW-K91, -K91n, -K91ac: WLAN measurement application not yet speed optimized.
V1.42	FSW-K91, -K91n, -K91ac: The current auto level functionality AUTO SET Auto Level is not yet optimized for WLAN signals. Different to the FSQ-K91, FSV-K91 in RUN CONT mode, the auto level routine is not automatically performed prior to each IQ-data capture.
V1.42	FSW-K91, -K91n, -K91ac: Compared to the existing FSV-K91 and FSQ-K91 the following measurement results are not yet supported: <ul style="list-style-type: none"> - 802.11b/g standard - MIMO measurements - Power vs Time Full PPDU - Power vs Time Rising/Falling - Bit stream Measurement - Frequency Error vs Preamble - Phase Error vs Preamble
V1.42	FSW-K91, -K91n, -K91ac: SEM measurements. Select the WLAN standard using the 'MEAS Modulation Accuracy, Flatness,... Signal Description' key sequence. Now the SEM Measurements can be performed using the 'MEAS Spectrum Emission Mask Standard Files' key sequence. The standard subdirectory selection is taken from the previous step. The user has to select the SEM settings file with the correct channel bandwidth manually. For the FSQ-K91 and FSV-K91 this channel bandwidth selection was also performed automatically.
V1.42	FSW-K91, -K91n, -K91ac: In case <i>Evaluation Range PPDU Statistic Count</i> is activated, <i>Evaluation Range No. of PPDU's to analyze</i> will analyze '1 to 10922 PPDU's up to the maximum captured in the Magnitude Capture display'. The restriction 'up to the maximum captured in the Magnitude Capture display' will be removed for a future release – which is the current FSQ-K91 and FSV-K91 behavior!

Version	Function
V1.42	<p>FSW-K91, -K91n, -K91ac:</p> <p>In case the instrument is waiting for a trigger event and an 'Auto Level' adjustment shall be performed, the user won't be informed, that the instrument is waiting for a trigger event!</p> <p>Work around: perform the 'Auto Level' first and afterwards setup the trigger condition.</p>
V1.42	<p>FSW-K91ac:</p> <p>IQ Offset tolerance limits are not supported with this firmware version.</p>
V1.41	<p>FSW-B17: If the Input Sample Rate is much lower than the Sample Rate an error message may occur.</p>
V1.41	<p>FSW-B17 & FSW-K7 (some higher demodulation bandwidths) or FSW-K72/73:</p> <p>Input Sample Rate 100MHz, 50MHz, 32 MHz, 25MHz, 20 MHz, 12.5 MHz are supported. For other input sample rates the results may be corrupted.</p>
V1.41	<p>FSW-K6: After aborting a measurement via SCPI (:ABORT) the status bar still shows "Measuring...".</p>
V1.41	<p>FSW-K6: The following commands are not available:</p> <p>[SENSe:]FREQuency:CENTer:STEP:AUTO</p> <p>[SENSe:]FREQuency:CENTer:STEP</p>
V1.21	<p>FSW-K30: After Save Recall the trace displays are not updated correctly</p>
V1.10	<p>LXI class C 1.3 is available but not yet fully standard compliant.</p>

7 Modifications to the Documentation

The new and modified functions mentioned in these release notes are already documented. Except the below mentioned last minute changes you can find the description including remote commands in the online help or in the manual. The manual can be downloaded from the internet under: <http://www.rohde-schwarz.com>. Select "DOWNLOAD" and search for R&S FSW within the category MANUAL.

7.1 Last Minute Changes to the Operating Manual

None.

8 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 make sure that you get the right information.

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