



**ROHDE & SCHWARZ**

Test and Measurement  
Division

## **Release Notes**

# **Phase Noise Test**

## **Application Firmware R&S FS-K40**

### **Release 4.70**

### **with Service Pack 2**

for R&S FSP, FSU, FSQ, FSG, FSMR  
Analyzer Firmware V4.7x

#### **New Features:**

- The maximum frequency offset that can be measured has been increased to 30 GHz (with Service Pack 2).

**Release Note Revision: 4**

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## History

Date	Rel Note Rev	Changes
20 May 2011	1	First revision for Phase Noise Application Firmware 4.70.
07 August 2012	2	Improvements with Service Pack 1 added.
26 October 2012	3	Improvements with Service Pack 2 added.
12 January 2016	4	FSQ version V4.75 SP7 added.

## General Topics

### Compatibility of the R&S FS-K40 Phase Noise Application Firmware with other Firmware Releases

The following table shows the compatible versions of the basic analyzer firmware and the Phase Noise Application Firmware:

Table of compatible versions:

R&S FS-K40 Application Firmware	R&S FSP Basic Firmware	R&S FSU Basic Firmware	R&S FSQ Basic Firmware	R&S FSMR Basic Firmware	R&S FSG Basic Firmware
4.70 SP2	-	4.71 SP5	4.75 SP7 4.75 SP5	-	4.79 SP5
4.70 SP1	-	4.71 SP4	4.75 SP4	-	4.79 SP4
4.70	-	4.71	4.75	-	4.79
4.60	-	4.61	4.65	-	4.69
4.50 SP1	4.50	4.51	4.55 SP2	-	4.59 SP1
4.50	-	-	4.55	-	4.59
4.40	4.40	4.41	4.45	-	4.49
4.30 SP1	4.30	4.31 SP1	4.35 SP1	4.36	4.39 SP2
4.30	4.30	4.31	4.35	-	4.39
4.20 SP1	4.20	4.21	4.25	4.26	4.29
4.20	4.20	4.21	4.25	-	4.29
4.10	4.10	4.11	4.15	4.16 SP1	-
4.00	4.00	4.01	4.05	4.06	-
3.90	3.90	3.91	3.95	3.96	-
3.80	3.80	3.81	3.85	3.86	-
3.70	3.70	3.71	3.75	3.76	-
3.60	3.60	3.61	3.65	3.66 SP1	-

## **Firmware Update of the R&S FS-K40**

Since basic firmware version 4.2x a ZIP file with the update sets of the basic system firmware and all available applications is provided. This ZIP file is available in the instruments FIRMWARE section, e.g. R&S FSU of the Service Board on GLORIS.

Please follow the steps described in the instrument's basic firmware release note to perform a complete firmware update.

## **Enabling the Application Firmware via License Key Code Entry**

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

After installing the application firmware package a license key for validation must be entered. The license key is printed either on a label on the rear panel of the instrument or delivered as a part of the R&S FS-K40 Phase Noise application firmware package.

The key sequence for entering the license key is:

SETUP - GENERAL SETUP – OPTIONS - INSTALL OPTION

Use the numeric keypad to input the license key number and press ENTER.

- On a successful validation the message 'option key valid' will appear. The instrument will perform an automatic reboot.
- If the validation failed, the application firmware is not installed.  
The most probable reason will be that the instrument is not equipped with the correct basic firmware version. Therefore a messagebox will appear asking for installation of the correct basic firmware version.

If the application firmware package was not installed prior to entering the license key code, a message will appear asking for installation of the application firmware package.

**In any case please make sure that the correct basic firmware version and the application firmware package is installed prior to entering the license key code..**

## **New Functions in Version 4.70**

- The maximum frequency offset that can be measured has been increased to 30 GHz.  
(with Service Pack 2)

## **Improvements with option R&S FS-K40 Phase Noise Test Application Firmware**

1. [V4.60] Print: use user defined colors for printing.

## Improvements with Service Pack 1

Service Pack 1 corrects the following issues. The version numbers in brackets indicate the version in which the issue was observed for the first time.

1. [V4.70] The measurement results between 1 Hz and 10 Hz frequency offset have been improved.
2. [V4.70] The layout of the y-axis top and marker results above the trace has been improved.

## Improvements with Service Pack 2

None

## Known Issues

The version numbers in brackets indicate the version in which the issue was observed for the first time.

### Manual Operation and IEC/IEEE Bus

#### 1. [K40 V3.60] Estimated measurement times

The estimated measurement times displayed in the Meas Settings view are too low. They represent the time for a sweep to execute in ideal circumstances, and do not include processing time or time to execute the verification sequence.

#### 2. [K40 V3.60] Delta Marker display

If the difference between a normal and delta marker is large (e.g. 100 MHz) incrementing and decrementing the delta marker by small increments may have no effect. If the marker does move it is not possible to see the change in marker value as not enough decimal places are shown when the marker value is ~MHz and is in the Hz range of the trace.

#### 3. [K40 V3.60] Soft front panel

The setting parameter does not update when the numeric keys are pressed on the soft front panel. Pressing return to enter the value shows that the keystrokes have been received and the parameter updates correctly.

## Modified Functions

The behaviour of the following functions changed compared to earlier versions [the number in brackets indicates the firmware version that introduced the individual change]:

1. [V3.70] Selection of Logarithmic or Linear smoothing
2. [V3.70] Automatic Frequency and Level Control
3. [V3.70] Support for pre-amplifier
4. [V3.70] New function Reference Measurement
5. [V3.70] New softkey Preset Option
6. [V3.70] Changes to the General Settings and Measurement Settings screens

Softkeys have been added that will select various parameters in the settings screens with a single key press.

**7. [V3.70] Improvements to the Verify Frequency and Level functionality**

Verify frequency and level has been improved to be more reliable.

**8. [V3.70] Changes to Measurement Settings:**

- The 10 kHz RBW filter no longer defaults to FFT mode.
- The 30 MHz RBW filter is not selectable.

**9. [V3.80] Trace Math Functionality**

The trace stored in TRACE3 may be subtracted from TRACE1 or TRACE2 using the trace math submenu of the trace softkey menu.

**10. [V3.80] Trace Offset**

If a non-zero trace offset is set by the user it will be shown on the trace display.

**11. [V3.80] Max Hold Trace**

A max hold trace mode is now available in the trace menu and via remote control.

**12. [V3.80] The use FFT softkey in the measurement settings is now an ON/OFF toggle.**

**13. [V3.80] A SMOOTHING% softkey has been added to the general settings menu.**

**14. [V3.80] Obtaining residual noise and spot noise for trace 2 and 3 using remote control**

It is now possible to obtain the residual noise and spot noise results for trace 2 and trace 3.

FETCh:PNOIse1:RFM/RPM/RMS or FETCh:PNOIse2:RFM/RPM or FETCh:PNOIse3:RFM/RPM

**15. [V4.00] Spot Noise Table**

Spot Noise Results display now shows the selected trace from which the results are calculated.

**16. [V4.10] ASCII Trace Export now allows exporting to floppy/usb.**

**17. [V4.10] Printing: Optimized colours are now used for printing.**

**18. [V4.10] IEC/IEEE Bus: *TRACe:DATA* command now supports the output in binary format. (By setting: *FORMat:DATA REAL*)**

**19. [V4.10] IEC/IEEE Bus: OPC Handling for ibclear (device clear)**

**20. [V4.20] Support for new instrument model R&S FSG**

**21. [V4.30] Trace Menu Softkeys match and work like the Spectrum Analyzer**

**22. [V4.30] IEC/IEEE Bus: ASCII Trace Export supported by MMEM:STOR:TRAC**

**23. [V4.30] Min Hold Trace**

A Min Hold trace mode is now available in the trace menu and via remote control

**24. [V4.30] Added support for the External Mixer Option (B21).**

**25. [V4.30] Improved Frequency Verification for unstable signals.**

**26. [V4.30] Signal Verification/Tracking supported for Forward Sweep mode also.**

**27. [V4.30] Added support for the B24 Pre-Amplifier.**

**28. [V4.30] Added ability to measure upto 10GHz frequency offset.**

**29. [V4.40] Improved Phase Noise Curve with updated PLL BW at lower frequency offsets.**

**30. [V4.60] More accurate reporting of IFOVLD during running measurements.**

**31. [V4.60] Updated Marker and delta marker handling to match base system.**

**32. [V4.60] Preset RBW does not automatically select 50MHz RBW to allow better measurement results**

**33. [V4.70] Print: use user defined colors for printing.**

**34. [V4.70 SP2] The maximum frequency offset that can be measured has been increased to 30 GHz..**

## **Modifications to the Operating Manual**

The R&S FS-K40 Phase Noise application functions are included in a separate new manual set. Please refer to the following order numbers:

- 1301.9675.42-04- (English)

### **Modified Chapters for manual operation**

None

### **Modified Chapters for remote operation**

None

# 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.

### Europe, Africa, Middle East

Phone +49 89 4129 12345  
[customersupport@rohde-schwarz.com](mailto:customersupport@rohde-schwarz.com)

### North America

Phone 1-888-TEST-RSA (1-888-837-8772)  
[customer.support@rsa.rohde-schwarz.com](mailto:customer.support@rsa.rohde-schwarz.com)

### Latin America

Phone +1-410-910-7988  
[customersupport.la@rohde-schwarz.com](mailto:customersupport.la@rohde-schwarz.com)

### Asia/Pacific

Phone +65 65 13 04 88  
[customersupport.asia@rohde-schwarz.com](mailto:customersupport.asia@rohde-schwarz.com)

### China

Phone +86-800-810-8828 / +86-400-650-5896  
[customersupport.china@rohde-schwarz.com](mailto:customersupport.china@rohde-schwarz.com)