



**ROHDE & SCHWARZ**

Test and Measurement  
Division

## **Release Notes**

# **EUTRA/LTE Analysis**

## **Application Firmware**

## **R&S FSQ-K100/-K101/-K104/-K105**

## **Release 4.74**

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

### **New Features:**

- FSQ-K104 New unit for On/Off Power Measurement
- FSQ-K100/-K104 Support for 256 QAM modulation type
- FSQ-K100/-K101/-K104/-K105 Support for loading custom SEM XML

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## History

Date	Rel Note Rev	Changes
17 Dec 2015	1	Firmware 4.74

## General Topics

### Compatibility of the R&S FSQ-K100/-K101/-K104/-K105 EUTRA/LTE Application Firmware with other Firmware Releases

The following table shows the compatible versions of the basic analyzer firmware and the EUTRA/LTE Application Firmware:

Table of compatible versions:

R&S FSQ-K100 Application Firmware	R &S FSQ- K100/K104 Application Firmware	R &S FSQ- K100/K101/ K104/K105 Application Firmware	R&S FSQ Basic Firmware	R&S FSG Basic Firmware
-	-	4.74	4.75 SP7 4.75 SP5	4.79 SP5
-	-	4.72 SP2	4.75 SP5	4.79 SP5
-	-	4.72 SP1	4.75 SP5	4.79 SP5
-	-	4.72	4.75 SP4	4.79 SP4
		4.71	4.75 SP3	4.79 SP3
-	-	4.70 SP2	4.75 SP2	4.79 SP2
-	-	4.70	4.75	4.79
-	-	4.61 SP1	4.65 SP3	4.69 SP3
-	-	4.61	4.65 SP1	4.69 SP1
-	-	4.60	4.65	4.69
-	4.51	-	4.55 SP2	4.59 SP1
4.50 SP2	-	-	4.55 SP1	4.59
4.50 SP1	-	-	4.55	-
4.50	-	-	4.55	-

## Firmware Update of the R&S FSQ-K100/-K101/-K104/-K105 EUTRA/LTE Application Firmware

Since basic firmware version 4.5x 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 FSQ of the Service Board on GLORIS.

Please follow the steps described in the instrument's basic firmware release notes 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 FSQ-K100/-K101/-K104/-K105 EUTRA/LTE 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.

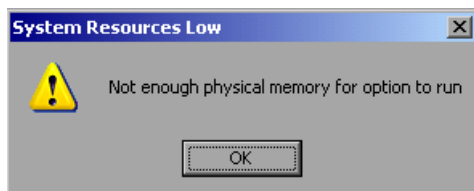
If the application firmware package was not installed prior to entering the license key code, a message will appear asking for installation of the application firmware package.

**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.**

Note any combination of K100, K101, K104 and K105 keycodes may be used.

## System Memory Requirements

For FSQ- K100/-K101/-K104/-K105 Application Firmware, an installed system memory of 512 MByte is essential. The FSQ- K100/-K101/-K104/-K105 will generate an error message during activation, if available system memory does not meet the requirements. This may happen for if other options are activated before starting the FSQ-K100/-K104.



For instruments, shipped with 256MByte system memory, a memory extension FSQ-B512, order number 1157.1590.02, is available.

A reboot of the instrument after using other options will allow FSQ- K100/-K101/-K104/-K105 to be activated without memory extension.

The system memory size can be easily checked by pressing SETUP – SYSTEM INFO – STATISTICS, item "Memory size". This item is available since version 3.25 of the base system firmware.

## **New Functionality in Version 4.74**

### **General**

- **Support for loading custom SEM XML**  
User custom SEM XML can be loaded in GUI and SCPI.

### **K100/K104 (DL)**

- **256 QAM modulation type**  
Support 256 QAM modulation measurements.

### **K104 (DL TDD)**

- **New unit for On/Off Power Measurement**  
OFF Power results either as an absolute value in dBm or a relative value in dBm/MHz.

## **Improvements**

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

1. [V4.73] **Corrected On/Off Power statistics count when over all frame count for IQ measurement is disabled.**

## Modified Functionality

The version numbers in brackets indicate the version in which the function was modified.

1. [V4.50 SP1] Spectrum Mask and ACLR channel bandwidth (2.5MHz, User) restrictions implemented.
2. [V4.50 SP1] Markers automatically position themselves on valid data.
3. [V4.50 SP1] Marker zoom support for Capture Memory.
4. [V4.50 SP1] 'Frame Start Offset' measurement result available.
5. [V4.50 SP1] 'Freq Err Vs Symbol' Measurement support for the 'All' Subframe Selection.
6. [V4.50 SP1] Spectrum Power RB measurement results displayed as hybrid histogram/trace.
7. [V4.50 SP1] A 'Nan' is returned via SCPI or a blank entry is displayed when the dB result is not finite i.e. dB equivalent for EVM = 0%.
8. [V4.50 SP1] A 'Nan' is returned via SCPI or a blank entry is displayed for every dB results when any dB result in the set (mean, minimum, maximum) is not finite.
9. [V4.50 SP1] Disabled 'Auto Demodulation' setting on any PDSCH Subframe Configuration modification.
10. [V4.50 SP1] Modified Allocation Summary measurement results to append a single EVM result for All Allocation Ids and All RBs.
11. [V4.50 SP2] LTE Measurements support for the 'Optimal, Pilot and Payload' Channel Estimation algorithm.
12. [V4.51] LTE Data can now be recalled when the LTE option is not active.
13. [V4.51] Cleared Previous result summary results after an analysis error.
14. [V4.51] Modified RF Input Power measurements (Power Spectrum, Power vs. RB, Allocation Summary Power, List: Power and List: OSTP) and Capture Buffer to include the effect of the Ext Attenuation.
15. [V4.51] Modified Ref Level to include the effect of the Ext Attenuation.
16. [V4.51] Corrected Physical Layer Cell Identity settings now used for measurements, previously 'Auto' always used.
17. [V4.51] Corrected PHICH Modulation (Allocation Summary measurement) reporting.
18. [V4.51] SCPI :CONFigure:LTE:DL:PLCI:PLID and :CONFigure:LTE:DL:PLCI:CIDGroup DEFault setting now enables AutoID.
19. [V4.51] 'Auto Level' disabled if related parameters modified.
20. [V4.51] Disabled 'Auto' for Physical Layer Cell Identity if related parameters 'Cell Id' 'Cell Identity Group' or 'Identity' modified.
21. [V4.51] Modified Marker X-axis setting popup and Marker X-axis display report to use same unit scaling.
22. [V4.51] Ensured 'Demod Settings' changes whilst in Continuous measurement mode are used for the next analysis.
23. [V4.51] Corrected continuous measurement of 1.4MHz bandwidths signals; previously analysis and results reporting would stop being updated after a small number of measurement.
24. [V4.51] Corrected SCPI ACLR measurement 'Rel. Power of upper adjacent channel' result.
25. [V4.51] Corrected 'DISPLAY LIST' update on next measurement after selection from Spectrum Mask or ACLR measurements.
26. [V4.60] Support for Uplink (K101, K105)

- 27. [V4.60] The definition of the MIMO physical channel power boosting has changed compared to the FSQ-K100, FSQ-K104 V4.51 release. The EPRE is now defined on a per antenna port basis as specified in R1-101470s.
- 28. [V4.60] Channel BW 'User' is not an option when a standard Resource Block setting is selected.
- 29. [V4.60] Corrected Allocation Summary SCPI modulation results.
- 30. [V4.60] Unsupported SCPI Fornat Data option 'PACKED' removed.
- 31. [V4.60] A Measurement group can be selected without forcing a default measurement on the currently selected screen.
- 32. [V4.60] Modifying RF or EL Attenuation will disable Auto-Level.
- 33. [V4.61] Support for downlink multicarrier filter.
- 34. [V4.70] Corrected 'Channel Flatness' and 'Channel Flatness Difference' measurement results.
- 35. [V4.70] Corrected 'multicarrier filter' state change applied in continuous mode.
- 36. [V4.70] Corrected 'CONF:LTE:UL:BW'-invalid deactivation of auto demodulation.
- 37. [V4.71] Settings file support for PUSCH Hopping Offset, PUSCH Hopping bits and Frame Number offset.
- 38. [V4.71] Corrected clipping of oversize loaded IQ files.
- 39. [V4.71] Ensured ACLR list results only display current results.
- 40. [V4.71] Adjusted ACLR limits to latest 3GPP test specification
- 41. [V4.71] Limited Uplink 'Subframe configuration' 'Number of RB' to a maximum of 100 and 'Offset RB' to a maximum of 99.
- 42. [V4.71] Limited 'Number of RB PUCCH' to a maximum of 'Signal Characteristics - Number of RB' or 100 whichever is the smaller.
- 43. [V4.71] Limited 'Number of subbands' to a maximum of 'Signal Characteristics - Number of RB' less 'Number of RB PUCCH' or 100 whichever is the smaller.
- 44. [V4.71] Spectrum Emission Mask trace is reported without data smoothing for consistency with Spectrum Emission Mask List results.
- 45. [V4.71] Ensured Frame Count restarted on settings change during partially completed statistics measurement.
- 46. [V4.71] Corrected clicking attenuator on subsequent LTE autolevel measurements if Spectrum Analyser frequency set to 1GHz prior selecting LTE.
- 47. [V4.71] Marker will align on peak of current measurement when switched on.
- 48. [V4.72] Limit Group Hopping or Sequence Hopping selection to only one being set at any one time.
- 49. [V4.72] Spectrum Emission Mask trace report is for the default number (625) of sweep points unless specified in the SEM STD XML file.
- 50. [V4.72] Spectrum ACLR SCPI List report now includes the 'Upper Power' and 'Limit' results.
- 51. [V4.72] 'Number of RB' can only be modified via the 'Channel Bandwidth BW' setting.
- 52. [V4.72 SP1] SCPI command '\*TRG' added.
- 53. [V4.74] On/Off Power limit value depends on center frequency setting.

# Known Issues with Option R&S FSQ-K100/-K101/-K104/-K105 EUTRA/LTE Application Firmware

The version numbers in brackets indicate the version in which the issue was observed for the first time. Unless otherwise stated all listed issues apply to the FSQ-K100.

## Manual Operation and IEC/IEEE Bus

### 1. [K10x V4.50] Memory usage.

Performing combinations of calibration, activating and using the other options and activating and using FSQ-K10x on an instrument may lead to the FSQ-K10x option no longer being able to be activated due to insufficient memory.

**Workaround:** Ensure no other applications are running. Restarting the firmware after performing calibration also improves memory usage. Using Preset also releases memory.

### 2. [K101/K105 V4.50] An overload may occur in auto level mode with UL signals over a limited range (-40 , -30 dB) for frequency sweep measurements.

## IEC/IEEE Bus only

### 1. [K100 V4.50 SP2] INITiate:CONTInuous OFF command should not be used to terminate a continuous measurement sequence.

Do not use the INITiate:CONTInous OFF command when an continuous measurement sequence is running as it may not fully abort the measurement sequence and further measurements will not be possible until after a Preset.

**Workaround:** Use ABORt to terminate a continuous measurement sequence.

## Modifications to the Operating Manual

The R&S FSQ-K100/-K101/-K104/-K105 analyzer functions are included in a separate manual set. Please refer to the following order number:

- 1173.0620.42-03- (English)



# 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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