



**ROHDE & SCHWARZ**

Test and Measurement  
Division

## **Release Notes**

# **EUTRA/LTE Analysis**

## **Application Firmware**

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

## **Release 4.61**

## **with Service Pack 1**

for R&S FSQ, FSG Analyzer Firmware V4.6x

### **New Features:**

- Downlink multicarrier filter

**Release Note Revision: 2**

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## **Contents**

<b>History .....</b>	<b>3</b>
<b>General Topics .....</b>	<b>3</b>
Compatibility of the R&S FSQ-K100/-K101/-K104/-K105 EUTRA/LTE Application Firmware with other Firmware Releases .....	3
Firmware Update of the R&S FSQ-K100/-K101/-K104/-K105 EUTRA/LTE Application Firmware .....	3
Enabling the Application Firmware via License Key Code Entry .....	4
<b>System Memory Requirements .....</b>	<b>4</b>
<b>New Functionality in Version 4.61 .....</b>	<b>5</b>
General .....	5
<b>Improvements with Service Pack 1.....</b>	<b>5</b>
<b>Modified Functionality .....</b>	<b>5</b>
<b>Known Issues with Option R&amp;S FSQ- K100/-K101/-K104/-K105 EUTRA/LTE Application Firmware .....</b>	<b>6</b>
Manual Operation and IEC/IEEE Bus.....	6
IEC/IEEE Bus only .....	7
<b>Modifications to the Operating Manual .....</b>	<b>7</b>
Modified Chapters for manual operation .....	7
Modified Chapters for remote operation.....	8
Status Reporting System .....	8
STATus:QUESTionable:LIMit Register.....	9
STATus:QUESTionable:SYNC Register.....	9
[SENSE][:LTE]:DL:DEMod:MCFilter <State> .....	10
<b>Customer Support.....</b>	<b>11</b>
Technical support – where and when you need it .....	11

Up-to-date information and upgrades.....11

## History

Date	Rel Note Rev	Changes
15 Dezember 2010	1	Firmware 4.61.
09 March 2011	2	Improvements with Service Pack 1 added; new chapter "Customer Support".

## 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
-	-	4.61 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 4.61**

### **General**

- Downlink multicarrier filter

## **Improvements with Service Pack 1**

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

1. [V4.61] **Corrected minor GDI (Graphical Device Interface) and User objects resource leak on LTE entry/exit cycle.**

## **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.

## **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.

3. (K101/K105 V4.50) 'Channel Flatness' and 'Channel Flatness Difference' measurement results are 50% of true level.
4. (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.
5. (K101/K105 V4.61) In run continuous mode the multicarrier filter state change might not be applied.

If the multicarrier filter is switched ON or OFF during run continuous, the change in the setting might not be applied correctly.

**Workaround:** Stop the run continuous mode, change the multicarrier filter setting and restart the run continuous mode.

## **IEC/IEEE Bus only**

1. (K100 V4.50 SP2) **INITiate:IMMediate:CONTInuous OFF** command should not be used to terminate a continuous measurement sequence.

Do not use the INITiate:IMMediate: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.

2. (K101/K105 V4.50) The 'CONF:LTE:UL:BW'-command deactivates the auto demodulation.

## **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)

## **Modified Chapters for manual operation**

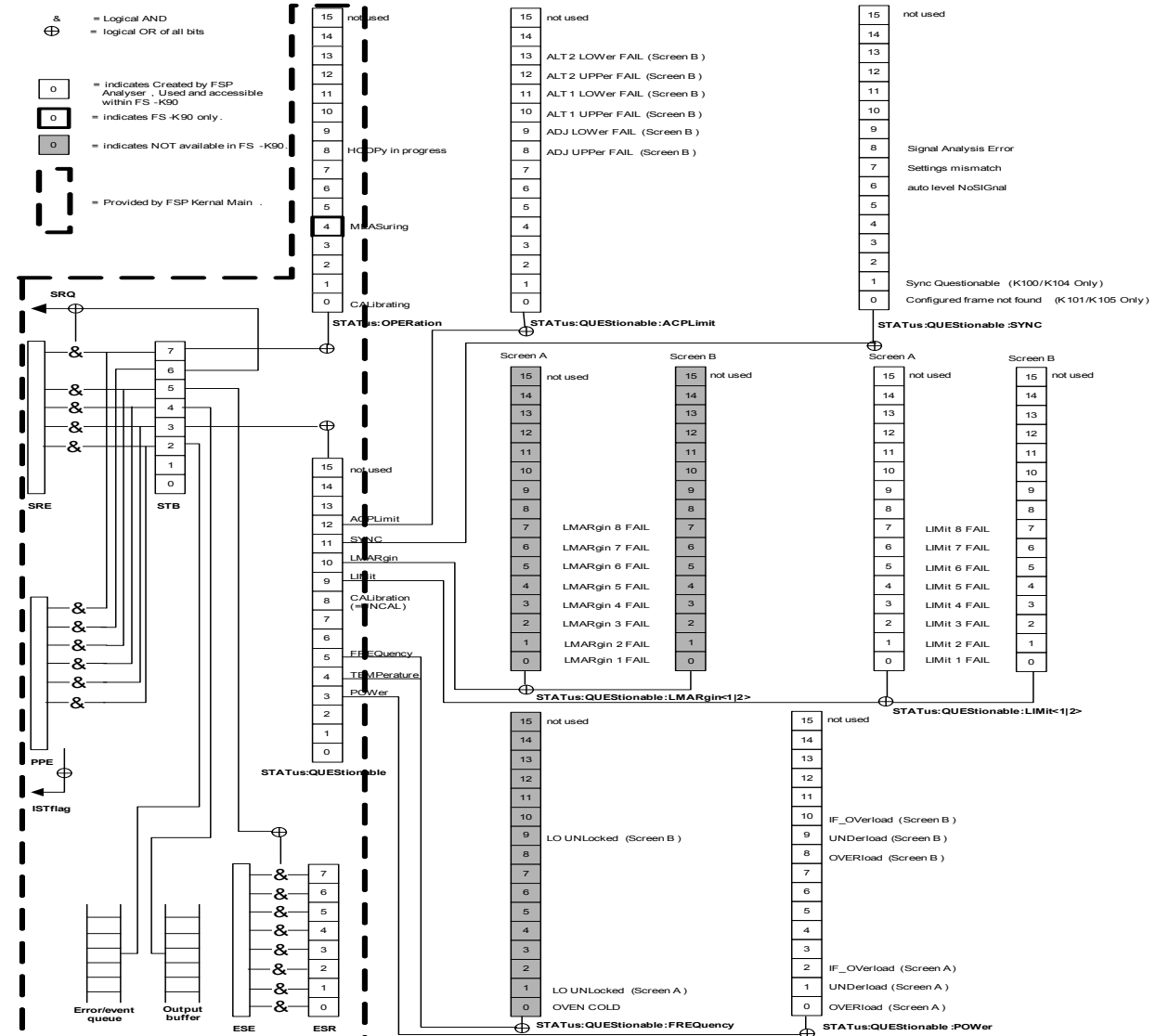
### **Multicarrier Filter**

The Multicarrier Filter suppresses interference from adjacent LTE/WDCMA/GSM/etc. carriers.

Remote: SENS:DL:DEM:MCF ON

## Modified Chapters for remote operation

### Status Reporting System





## **STATus:QUESTionable:LIMit Register**

This register comprises information about the observance of limit lines in the corresponding measurement window (LIMit 1 corresponds to Screen A, LIMit 2 to Screen B).

It can be queried with commands

```
STATus:QUESTionable:Limit :CONDition? and  
STATus:QUESTionable:Limit[:EVENT ]?.
```

Note that no limit lines are displayed in screen A and as such all bits in the LIMit1 register are always set to 0.

Bit No	Meaning
0	LIMit FAIL This bit is set if limit line 1 is violated
1	LIMit FAIL This bit is set if limit line 2 is violated
2	LIMit FAIL This bit is set if limit line 3 is violated
3	LIMit FAIL This bit is set if limit line 4 is violated
4	LIMit FAIL This bit is set if limit line 5 is violated
5	LIMit FAIL This bit is set if limit line 6 is violated
6	LIMit FAIL This bit is set if limit line 7 is violated
7	LIMit FAIL This bit is set if limit line 8 is violated
10-14	These bits are not used
15	This bit is always 0

## **STATus:QUESTionable:SYNC Register**

This contains information about settings mismatch, sync and analysis error.

The bits can be queried with commands

```
STATus:QUESTionable:LIMit<1>:CONDition? and  
STATus:QUESTionable:LIMit<1>[:EVENT?].
```

Bit No	Meaning
0	Configured frame not found (K101/k105 Only)
1	SYNC Questionable (K100/K104 Only) This bit is set if there is either 'P sync' or 'S sync' or 'Coarse OFDM symbol timing' failure.
2 to 5	These bits are not used
6	Auto level – no signal present.
7	Settings mismatch.
8	Signal Analysis Error.
9 to 14	These bits are not used
15	This bit is always 0

**[SENSe][:LTE]:DL:DEMod:MCFilter <State>**

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Activates or deactivates the multicarrier filter for DL.

**Example**

```
SENS:DL:DEMod:MCF ON
```

Activate the multicarrier filter for DL.

**Parameters**

ON | OFF

**Characteristics**

\*RST value: OFF

SCPI: device specific

## **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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