



**ROHDE & SCHWARZ**

Test and Measurement  
Division

## **Release Notes**

# **3G FDD BTS/3GPP HSDPA BTS/ 3GPP HSPA+ BTS**

**Application Firmware**

**R&S FS-K72/FS-K74/FS-K74+**

## **Release 4.50 with Service Pack 1**

for R&S FSP, FSU, FSQ, FSG, FSMR, FSUP, FMU  
Analyzer Firmware 4.5x

### **New Features:**

- Single antenna MIMO measurement
- Time Alignment Error measurement
- RRC receiver filter switch

**Release Note Revision: 3**

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## History

<b>Date</b>	<b>Rel Note Rev</b>	<b>Changes</b>
19 August 2009	1	First revision for R&S FS-K72/R&S FS-K74/R&S FS-K74+ version 4.50.
20 January 2010	2	Improvements with Service Pack 1 added.
28 January 2010	3	Improvement ":TRACe1? ABITstream" added. Known issue added.

## General Topics

### Hardware Requirements

Please note that R&S FS-K72/K74/K74+ requires options R&S FSP-B15 and R&S FSP-B70 in order to run on an R&S FSP. If either of the required hardware options is not installed the unit will not accept the license key for the corresponding firmware application.

## Compatibility of R&S FS-K72/K74/K74+

The following table shows the compatible versions of the basic analyzer firmware and the 3G FDD BTS Application Firmware R&S FS-K72, the 3GPP Application Firmware R&S FS-K74 (FS-K74 is supported since version 2.28/3.28) and the 3GPP Application Firmware R&S FS-K74+ (FS-K74+ is supported since version 4.30):

**Table of compatible versions:**

<b>R&amp;S FS-K72/K74 Application Firmware</b>	<b>R&amp;S FSP Basic Firmware</b>	<b>R&amp;S FSU Basic Firmware</b>	<b>R&amp;S FSQ Basic Firmware</b>	<b>R&amp;S FSMR Basic Firmware</b>	<b>R&amp;S FSUP Basic Firmware</b>	<b>R&amp;S FMU Basic Firmware</b>	<b>R&amp;S FSG Basic Firmware</b>
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	4.30	4.31	4.35	-	-	4.38	4.39
4.20 SP1	4.20	4.21	4.25	-	4.27	-	4.29
4.20	4.20	4.21	4.25	-	-	-	4.29
4.17	-	-	-	-	4.17	-	-
4.10	4.10	4.11	4.15	4.16	-	-	-
4.01	-	-	-	-	-	4.08	-
4.00	4.00	4.01	4.05	-	-	-	-
3.90 SP1	3.90	3.91	3.95	3.96	3.99	-	-
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 SP1	-	-	-
3.60	3.60	3.61	3.65	3.66 SP1	-	-	-
3.50	3.50	3.51	3.55	-	-	-	-
3.40	3.40	3.41	3.45	-	-	-	-
3.35	-	-	3.35	-	-	-	-
3.30	3.30	3.31	-	-	-	-	-
3.28	3.20	3.21	3.25	-	-	-	-
3.24	3.10	3.11	3.15	-	-	-	-
3.20	3.00	-	3.05	-	-	-	-
2.60	2.60	2.61	-	-	-	-	-
2.40	2.40	2.41	2.45	-	-	-	-
2.35	-	-	2.35	-	-	-	-
2.30	2.30	2.31	-	-	-	-	-
2.28	2.20	2.21	2.25	-	-	-	-
2.24	2.10	2.11	2.15	-	-	-	-
1.21	-	-	2.05	-	-	-	-
1.20	1.80	1.81	1.85	-	-	-	-
1.12	1.70	1.71	1.75	-	-	-	-
1.11	1.60	1.61	1.65	-	-	-	-
1.10	1.50	1.51	-	-	-	-	-
1.00	-	1.41	-	-	-	-	-

Application firmware versions 3.xx are running on R&S FSPs with order # 1164.4391.xx or R&S FSU with order # 1166.1660.xx or R&S FSQ with operating system XP.

Application firmware version 2.xx are running on R&S FSPs with order # 1093.4495.xx or R&S FSU with order # 1129.9003.xx or R&S FSQ with operating system NT.

# Firmware Update of R&S FS-K72/K74/K74+

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-K72 3G FDD BTS, R&S FS-K74 HSDPA BTS and R&S FS-K74+ HSPA+ BTS 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.

- Each application firmware R&S FS-K72 3G FDD BTS, R&S FS-K74 HSDPA BTS and R&S FS-K74+ HSPA+ BTS has its own option key. The K72 3G FDD BTS is a prerequisite for installing the K74 HSDPA BTS and the K74+ HSPA+ BTS application firmware
- Installing FS-K72:               option key for FS-K72 must be entered
- Installing FS-K74:               option key for FS-K72 **and** option key for FS-K74 must be entered
- Installing FS-K74+:             option key for FS-K72 **and** option key for FS-K74+ must be entered **or**  
   option keys for FS-K72, FS-K74 **and** FS-K74+ must be entered
- On a successful validation the message 'option key valid' will appear.
- 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 message box 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

- Single antenna MIMO measurement
- Time Alignment Error measurement
- RRC receiver filter switch

## Improvements

None.

## 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. (V4.50) The symbol indication uses wrong number of bits/symbol for channel type MIMO-QPSK. Only the display mode BITSTREAM is affected.
2. (V4.50) The channel search sometimes fails for MIMO channels of antenna 2.
3. (V4.50) For channels on antenna 2 with modulation type MIMO-QPSK and MIMO-16QAM the bits output via the remote command ":TRACe1? ABITstream" is wrong.

## Known Issues

1. (V4.20) Auto detection of channels with low data rate:  
If a data channel contains a large number of suppressed symbols (DTX), the channel can not be detected. This is caused by an inherent modulation type analyzer. If the sent symbol constellation does not match a constellation according to 3GPP (QPSK, 16QAM), the channel is marked as invalid channel.
2. (V4.50) HS-SCCH channel 9.128 coded (test model 5 - 6 DPCH - 2 HS-PDSCH) sometimes get lost.  
**Work around:** Switch the automatic search algorithm off by using the Predefined Channel feature.

## Modified Functions

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

1. [V1.11] New functions: Antenna Diversity, Sync Type CPICH / SCH
2. [V1.12] Carrier Frequency Error now determined on per slot basis
3. [V1.12] New result display types: Composite Constellation, Power vs. Symbol
4. [V1.12] New: Support for Compressed Mode signals

5. [V1.20] Margin check of xdB margin below Spectrum Emission Mask Limit Lines
6. [V3.20/V1.20] Output of frequency and response value if margin check failed
7. [V3.20/V1.21] Improved sensitivity for code channels with low SN ratio (6dB SNR of a code class 8 channel is sufficient to detect the channel in auto search mode)
8. [V3.20/V1.21] Pilot symbol check added.
9. [V3.20/V1.21] For signalling a detection of a pilot symbol that is different from that of the 3GPP standard the 5<sup>th</sup> Bit of the status register is used.
10. [V3.24/V2.24] Code Domain Error Power measurement is now available
11. [V3.24/V2.24] Improved Resolution of Trigger to Frame measurement
12. [V3.24/V2.24] Improved absolute accuracy of Trigger to Frame measurement
13. [V3.24/V2.24] Trace statistic available on result summary parameters (MIN Hold, MAX Hold, Averaging)
14. [V3.24/V2.24] Improved compressed mode handling
15. [V3.28/V2.28] Support of FS-K74 HSDPA BTS Test including automatic channel search
16. [V3.28/V2.28] Unit circle display in constellation diagrams
17. [V3.28] Option FS-K9 power sensor support for RF measurement
18. [V3.30/V2.30] New function: Multi-Frame Evaluation
19. [V3.30/V2.30] Detection of SCCPCH is now available
20. [V3.30/V2.30] Improved detection sensitivity for HSDPA channels
21. [V3.30/V2.30] Spectrum emission mask – IEC readout of worst fail position
22. [V3.30/V2.30] Auto channel detection of compressed mode channels
23. [V3.40/V2.40] IEC readout of frame bit-stream
24. [V3.40/V2.40] Slot power difference of power versus slot measurement
25. [V3.40/V2.40] Adjacent channel leakage power ratio (ACLR) for multi carrier signals
26. [V3.40/V2.40] Peak list evaluation of spectrum emission mask
27. [V3.40/V2.40] Advanced auto level adjust of multi carrier signals
28. [V3.40/V2.40] Autolevel Adjust for channel power measurement and statistic measurement
29. [V3.50/V2.60] Extended scrambling code range
30. [V3.50/V2. 60] Advanced channel type estimation for compressed mode
31. [V3.50/V2. 60] Display of slot format type A and type B
32. [V3.50/V2. 60] Display of TPC Symbols in the first slot of a compressed gap
33. [V3.50/V2. 60] Constellation re-arrangement for 16 QAM in dependence on constellation parameter B
34. [V3.50/V2. 60] Absolute and relative slot power display and differential slot power display added
35. [V3.50/V2. 60] Extended trigger range
36. [V3.50/V2. 60] RF combination measurement (RF Combi)
37. [V3.60/V2.60] Display of frequency error versus slot, phase discontinuity versus slot, symbol magnitude error and symbol phase error
38. [V3.60/V2.60] Result Summary: added value RHO
39. [V3.60/V2.60] Scrambling code input in hex and also in decimal
40. [V3.60/V2.60] HSDPA mode can be switched OFF / ON
41. [V3.60/V2.60] Measurement of timing offset in predefined channel mode
42. [V3.60/V2.60] Multi carrier ACP measurement with independent inter carrier spacing support
43. [V3.60/V2.60] SEM: Extended range definition for peak list and adjustable transition frequency
44. [V3.60/V2.60] External trigger level adjustable from 0.5 to 3.5 V
45. [V3.60/V2.60] Carrier frequency step size softkey available

- 46. [V3.70/V2.80] Scrambling code auto search
- 47. [V3.70/V2.80] Channel table compare mode
- 48. [V3.70/V2.80] Remote command to read out total power versus slot
- 49. [V3.70/V2.80] ACLR/MCACL: number of adjacent channels increased to 12, power mode to max hold the power results
- 50. [V3.70/V2.80] RF COMBI: noise correction mode
- 51. [V3.80/V2.80] Support for HSUPA within R&S FS-K74
- 52. [V3.80/V2.80] Trace view available within code domain analyzer
- 53. [V3.90] List result of scrambling code search
- 54. [V4.00] Vector error of Error Vector Magnitude (EVM) versus chip
- 55. [V4.00] Magnitude error of Error Vector Magnitude (EVM) versus chip
- 56. [V4.00] Phase error of Error Vector Magnitude (EVM) versus chip
- 57. [V4.00] Spectrum emission mask: List evaluation in lower screen now supported
- 58. [V4.00SP1] New remote command TRACe:DATA? ATRACE2
- 59. [V4.10] New remote command CALC:MARK:FUNC:WCDP:RES? PSYMBOL | AChannels
- 60. [V4.20] Support for instrument R&S FSG.
- 61. [V4.20] Soft key REF VALUE Y AXIS available for CDP measurements.
- 62. [V4.30] New option R&S FS-K74+ with support of 64QAM.
- 63. [V4.30] Relative Code Domain Error (RCDE) display available.
- 64. [V4.30] User definable CPICH code number and pattern.
- 65. [V4.30] Average power of inactive channels display
- 66. [V4.40] Average RCDE display
- 67. [V4.50] Single antenna MIMO measurement
- 68. [V4.50] Time Alignment Error measurement
- 69. [V4.50] RRC receiver filter switch

## Modifications to the Operating Manual

The R&S FS-K72/K74/K74+ 3G FDD BTS analyzer functions are included in a separate manual set. Please refer to the following order numbers:

- 1154.7023.42-08 English
- 1154.7023.44-08 German

## Modified Chapters

None

## **Appendix: Contact to our hotline**

Any questions or ideas concerning the instrument are welcome by our hotline:

### **USA & Canada**

Monday to Friday (except US public holidays)

8:00 AM – 8:00 PM Eastern Standard Time (EST)

Tel. from USA                      888-test-rsa (888-837-8772) (opt 2)

From outside USA                +1 410 910 7800 (opt 2)

Fax                                    +1 410 910 7801

E-mail                                [Customer.Support@rsa.rohde-schwarz.com](mailto:Customer.Support@rsa.rohde-schwarz.com)

### **East Asia**

Monday to Friday (except Singaporean public holidays)

8:30 AM – 6:00 PM Singapore Time (SGT)

Tel.                                    +65 6 513 0488

Fax                                    +65 6 846 1090

E-mail                                [Customersupport.asia@rohde-schwarz.com](mailto:Customersupport.asia@rohde-schwarz.com)

### **Rest of the World**

Monday to Friday (except German public holidays)

08:00 – 17:00 Central European Time (CET)

Tel. from Europe                +49 (0) 180 512 42 42

From outside Europe            +49 89 4129 13776

Fax                                    +49 (0) 89 41 29 637 78

E-mail                                [CustomerSupport@rohde-schwarz.com](mailto:CustomerSupport@rohde-schwarz.com)