ROHDE & SCHWARZ

Test and Measurement Division

Release Notes

3G FDD BTS/3GPP HSDPA BTS

Application Firmware R&S FS-K72/FS-K74

Release 4.17

for R&S FSUP Analyzer Firmware 4.17

Release Note Revision: **1**

Printed in the Federal Republic of Germany

Contents

History

Date	Rel Note Rev	Changes
8. August 2007	1	First revision for R&S FS-K72/R&S FS-K74 version 4.17

Compatibility of R&S FS-K72/K74

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

Table of compatible versions:

R&S FS-K72/K74 Application Firmware	R&S FSP Basic Firmware	R&S FSU Basic Firmware	R&S FSQ Basic Firmware	R&S FSMR Basic Firmware	R&S FSUP Basic Firmware	R&S FMU Basic Firmware
4.17	-	-	-	-	4.17	-
4.10	4.10	4.11	4.15	4.16	-	4.18
4.01	-	-	-	-	-	4.08
4.00	4.00	4.01	4.05	-	-	-
3.90SP1	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

The R&S FS-K72/K74 Application Firmware package is available with its own version number. This application firmware package requires an appropriate basic instrument firmware version. Compatible revisions are shown in the table above.

Please make sure to have the correct basic firmware version installed prior to installing the R&S FS-K72/K74 Application Firmware. Please refer to the basic firmware version release notes for firmware update information of the basic firmware.

Note: *R&S FS-K72/74 and R&S FS-K73 are using the same update set. It is therefore required to only update one of these applications.*

Generation of an update disk set for R&S FS-K72/K74

The files needed for the R&S FS-K72/K74 Application Firmware update are available in the FIRMWARE section of the Service Board on GLORIS (R&S FS-K72 and FS-K74 are included in the same disc).

If you already have the update disk set you can skip this paragraph.

They are grouped according to the disk contents:

Disk 1:   disk1.bin   (self-extracting ZIP file)
For Version 3.xx only:
Disk 2:   data3.cab   (packed contents of disk 2, will be automatically unpacked by FW update)

The contents of disk 1 are packed in a self-extracting ZIP file and need to be unzipped. For this purpose the following steps are necessary:

1. Create a temporary directory on your local PC (e.g. MyTemp\Extensions\K72 on drive C:)
2. Copy disk1.bin into that directory and rename it to disk1.exe
3. Execute disk1.exe. Under Windows 95/98/NT/2000 this is done best using the following sequence:

   <CTRL><ESC> - RUN – C:\MyTemp\Extensions\K72\DISK1 - <ENTER> or

   <CTRL><ESC> - AUSFÜHREN – C:\MyTemp\Extensions\K72\DISK1 - <ENTER>for a German Windows version.

   The files will be unzipped.
4. **For Version 2.xx only:**
   Delete disk1.exe from the temporary directory.

   The temporary directory will now contain the following files:

inst32i.ex	_isdel.exe	_setup.dll	_sys1.cab	_user1.cab
Data.tag	data1.cab	id.txt	lang.dat	layout.bin
os.dat	Setup.exe	Setup.ini	setup.ins	setup.lid

   For Version 3.xx only:
   Delete disk1.exe from the temporary directory.

   The temporary directory will now contain the following files:

data1.cab	data1.hdr	data2.cab	ExecCtrl.exe	id.txt	ikernel.ex_
ISSetup.exe	layout.bin	RestInst.exe	Setup.exe	Setup.ini	setup.inx

   Please make sure that all filenames exactly match with these printed above before you try to use them for the firmware update. Especially the trailing underscore ('_') as used in ikernel.ex_ **or** _inst32i.ex_ **is essential for correct operation of the update program.**

5. Copy the contents of the temporary directory onto update disk #1.

For Version 3.xx only:

The content of the other disks is already packed in the format required by the firmware update program and need no further processing. The files only need to be copied onto disks #2, the number in the filename (minus 1) indicating the corresponding disk number (data3.cab => disk #2).

Preparing installation via LAN or USB stick:

If the installation shall be done via LAN or USB stick (XP only) please set up the following directory structure:

Copy all files as mentioned in the previous section in the directory ..\MyTemp\Extensions\K72\Disk1.
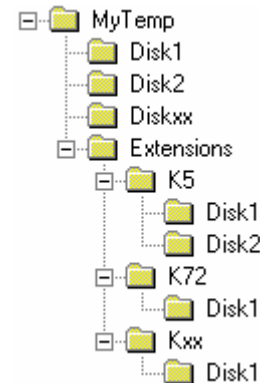
Performing the Application Firmware Update on the Instrument

The Application Firmware update process is performed in the following steps:

➢ Switch the instrument on and wait until the Analyzer has resumed operation.

➢ For updates from LAN or USB (XP only) use the SETUP | NEXT | FIRMWARE UPDATE | UPDATE PATH softkey to specify any path for the location of the Disk1 directory (e.g. F:\MyTemp\Extensions\K72). For floppy usage the default A:\ must not be changed

➢ Press SETUP → NEXT → FIRMWARE UPDATE

➢ Confirm the query "Do you really want to update the firmware?" with OK

➢ Insert update disk #1 (and #2 for version 3.xx) as requested (for LAN or USB just confirm the copy process)

➢ The instrument will perform several automatic shutdowns, until the new firmware is installed properly. **Do not switch the instrument off until the update process has been finished completely.**

After switching on the instrument for the first time after a successful firmware update it is necessary to execute the instument's self alignment process by pressing CAL and softkey CAL TOTAL.

Note: *R&S FS-K72/74 and R&S FS-K73 are using the same update set. It is therefore required to only update one of these applications.*

A simplified update process is available if base system firmware 4.1x or newer is installed. More details are described in the release note of the base system firmware.

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 and R&S FS-K74 HSDPA 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 and R&S FS-K74 HSDPA BTS has its own option key. The K72 3G FDD BTS is a prerequisite for installing the K74 HSDPA 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

➢ 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 <u>and</u> the application firmware package is installed prior to entering the license key code.

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 5th 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/MCACLR: 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

Problems Eliminated with 4.10

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

- 1. (K72/K74 V2.80/ V3.80) **Code domain error power display corrected**.
According to 3GPP specification the code domain error (CDE) measurement displays the chip error of the signal spread to the channels spreading factor 256. In previous versions the spreading factor of the CDE measurement has been varied by adjusting the spreading factor of the Peak Code Domain Error Power (PCDEP) measurement. According to 3GPP the spreading factor of CDE is fixed to 256 and only the spreading factor of PCDEP may be varied. The unwanted dependency of CDE spreading factor on PCDEP spreading factor has been eliminated within this version.

- 2. (K72/K74 V4.00) **Selectable number of pilot symbols in predefined channel table corrected.**
The correction only applies to compressed mode channels with increased data rate by 2 in predefined mode if a new channel is added to the channel table. In case of an increased data rate, the number of pilot symbols is doubled compared to standard DPCH channels. In the previous version it was not possible to select the correct number of pilot symbols for the following two channel types: CPR_SF2 and CPR_SF2_TPC.

- 3. (K72/K74 V4.00) Predefined Channel Table 3GB_2 corrected (more than 3 DPCH channels)**.**

Modifications to the Operating Manual

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

- 1154.7023.44-03 German and English

Modified Chapters for manual operation

None

Modified Chapters for remote operation

Query result of Frequency Error vs Slot

`:TRACe[:DATA]? ATRACE2`

FREQUENCY ERROR VS SLOT (ATRACe2)

This command returns a list of slot number / absolute frequency error vs slot for all slots.

Output: List of slot number and absolute frequency error values of all slots

Format: $\text{SlotNumber } 0, \text{FreqError}_0, ..., \text{SlotNumber } 14, \text{FreqError}_{14}$

Unit: [Hz]

Quantity: 15

Query result of Result Summary Parameters

:CALCulate<1>:MARKer<1>:FUNCtion:WCDPower[:BTS]:RESult?   PTOTal | FERRor | TFRame | TOFFset | MACCuracy | PCDerror | EVMRms | EVMPeak | CERRor | CSLot | SRATe | CHANnel | CDPabsolute | CDPRelative | IQOFfset | IQIMbalance | MTYPe | RHO | **PSYMbol | ACHannels**

This command queries the measured and calculated results of the 3GPP FDD code domain power measurement.

PTOTal	total power	FERRor	frequency error in Hz
TFRame	trigger to frame	TOFFset	timing offset
MACCuracy	composite EVM	PCDerror	peak code domain error
EVMRms	error vector magnitude RMS	EVMPeak	error vector magnitude peak
CERRor	chip rate error	CSLot	channel slot number
SRATe	symbol rate	CHANnel	channel number
CDPabsolute	channel power absolute	CDPRelative	channel power relative
IQOFfset	I/Q offset	IQIMbalance	I/Q imbalance
MTYPe	modulation type	**PSYMbol**	**Number of pilot bits**
RHO	rho value for every slot	**ACHannels**	**Number of active channels**

Example: `":CALC:MARK:FUNC:WCDP:RES? PTOT"`

Characteristics: *RST value: -
                                SCPI: device-specific

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

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

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