Release Notes

TD-SCDMA Base Station Test
Application Firmware R&S FS-K76

Release 4.10
for R&S FSP, FSU, FSQ, FSUP Analyzer Firmware 4.1x

Release Note Revision: 2

Printed in the Federal Republic of Germany
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<th>Note</th>
<th>Rev</th>
<th>Changes</th>
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<tr>
<td>03. April 2007</td>
<td>1</td>
<td></td>
<td>1</td>
<td>First revision for R&amp;S FS-K76 Firmware 4.10</td>
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<tr>
<td>06. August 2007</td>
<td>2</td>
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General Topics

Compatibility of R&S FS-K76 TD-SCDMA BTS Application Firmware

The following table shows the compatible versions of the basic analyzer firmware version and the TD-SCDMA BTS application firmware:

<table>
<thead>
<tr>
<th>R&amp;S FS-K76 Application Firmware</th>
<th>R&amp;S FSP Basic Firmware</th>
<th>R&amp;S FSU Basic Firmware</th>
<th>R&amp;S FSQ Basic Firmware</th>
<th>R&amp;S FSMR Basic Firmware</th>
<th>R&amp;S FSUP Basic Firmware</th>
<th>R&amp;S FMU Basic Firmware</th>
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<td>2.21</td>
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</tr>
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</table>

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-K76 TD-SCDMA BTS Application Firmware

The R&S FS-K76 TD-SCDMA BTS application firmware package is available with its own version number. This application firmware package requires an appropriate basic instrument firmware version. The compatible versions are shown in the table above. Please make sure to have the correct basic firmware version installed prior to installing the R&S FS-K76 TD-SCDMA BTS application firmware. Please refer to the basic firmware version release notes for firmware update information of the basic firmware.

Note: R&S FS-K76 and R&S FS-K77 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-K76

The files needed for the R&S FS-K76 TD-SCDMA BTS Application Firmware update are available in the FIRMWARE section of the Service Board on GLORIS (R&S FS-K76). 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)

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. FSK76TEMP 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/XP/2000 this is done best using the following sequence:
   - <CTRL><ESC> - RUN – C:\ FSK76TEMP \DISK1 - <ENTER> or
   - <CTRL><ESC> - AUSFÜHREN – C:\ FSK76TEMP \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.exe_ _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.exe_
   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.exe_ or _inst32i.exe_ is essential for correct operation of the update program.

5. Copy the contents of the temporary directory onto update disk #1.
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\K76\Disk1.

Performing an Application Firmware Update on the Instrument

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

- Switch on the instrument 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\K76). 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 as requested (for LAN or USB just confirm the copy process).

Do not switch off the instrument 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 instrument's self alignment process by pressing CAL and softkey CAL TOTAL.

Note: R&S FS-K76 and R&S FS-K77 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 analyzer or delivered as a part of the R&S FS-K76 TD-SCDMA 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.

- On a successful validation the message 'option key valid' will appear.
- If the validation failed, the application firmware is not installed.

The most likely reason will be that the instrument is not equipped with the correct basic firmware version. In this case 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.
Modified Functions

1. [V3.30/V2.30] “Signal Statistics” measurements CCDF and APD are supported.
2. [V3.30/V2.30] For all code domain analyzer measurements, the maximum capture length has been extended from 35 to 63 slots.
3. [V3.30/V2.30] “Composite Constellation” is available within the code domain analyzer.
5. [V3.30/V2.30] Unit circle display in constellation diagrams is shown.
6. [V3.50/V2.60] Change of default node for CALC2:FEED 'XTIM:CDP:PVSL'
   For compatibility reason with other 3G applications the default node for the IEC/IEEE bus command
   CALC2:FEED 'XTIM:CDP:PVSL[:ABS]' is changed to
   CALC2:FEED 'XTIM:CDP:PVSL[:RAT]'.
7. [V3.60/V2.60] External trigger level adjustable from 0.5 to 3.5V.
8. [V3.60/V2.60] Center Frequency Step size softkey available.
9. [V3.60/V2.60] Changed SCPI commands.
   In order to limit to 12 chars the :CALCulate2:FEED 'XTIMe:CDPower:SYMBol:CONStellation'
   and :CALCulate2:FEED 'XTIMe:CDPower:COMPosite:CONStellation' are changed to
   :CALCulate2:FEED 'XTIMe:CDPower:SYMBol:CONSt' and
   :CALCulate2:FEED 'XTIMe:CDPower:COMPosite:CONSt'.
10. [V3.70/V2.80] ACP: number of adjacent channels increased to 12.
11. [V3.70/V2.80] ACP: power mode to max holds the power results.
12. [V3.80/V2.80] Trace view available within code domain analyzer.
13. [V3.90] Support for noise correction in ACLR measurement with power trigger.
15. [V4.00] Support for High Speed Physical Downlink Shared Channel (HS-PDSCH) using 16QAM modulation symbols.
16. [V4.00] Spectrum emission mask: List evaluation in lower screen now supported.
17. [V4.00] Multicarrier ACP measurement support.

Problems Eliminated

None
Modifications to the Operating Manual and Supplements

For the R&S FS-K76 TD-SCDMA Base Station Test Application Firmware manuals please refer to the following order numbers:

- 1300.7304.44-03 (German/English)

They can be downloaded from R&S internet – search: FS-K76:

http://www.rohde-schwarz.com

Modified Chapters

Menu MEAS – POWER VS TIME

The softkey START MEAS starts a single sweep measurement.

IEC-Bus-command:

```
INIT:CONT OFF;:INIT
```

The softkey HIGH DYNAMIC selects the high dynamic mode. The sweep mode is automatically set to single sweep.

IEC-Bus-command:

```
:CONFigure:CDPower:BTS:PVTime:HDYNamic ON|OFF
```

Menu CHAN CONF

MODULATION TYPE:
Modulation type of the channel. You can choose between QPSK, 8PSK and 16QAM

IEC-Bus-command:

```
:CONFigure:CDPower[:BTS]:CTABle:DATA 1..6, 0..4, 1..16, 0..3, 1..16, 0 | 1, 0, 0...

< Channel type>, <Code class>, <Code number>, <Modulation type>, <Midamble shift>, <Status>, <Reserved 1>, <Reserved 2>, ....
```

Modulation type:
- 0 = invalid (for midamble)
- 1 = QPSK
- 2 = 8PSK
- 3 = 16QAM
The softkey LIST EVALUATION reconfigures the SEM output to a split screen. In the upper half the trace with the limit line is shown. In the lower half the peak value list is shown. For every range of the spectrum emission defined by the standard the peak value is listed. For every peak value the frequency, the absolute power, the relative power to the channel power and the delta limit to the limit line is shown. As long as the delta limit is negative, the peak value is below the limit line. A positive delta indicates a failed value. The results are then colored in red, and a star is indicated at the end of the row, for indicating the fail on a black and white printout.

If the list evaluation is active, the peak list function is not available.

IEC/IEEE-bus command:
:CALCulate1:PEAKsearch:AUTO ON | OFF

With this command the list evaluation which is by default for backwards compatibility reasons off can be turned on.

TRACe1:DATA? LIST
With this command the list evaluation results are queried in the following order: <no>, <start>, <stop>, <rbw>, <freq>, <power abs>, <power rel>, <delta>, <limit check>, <unused1>, <unused2>
All results are float values.

<table>
<thead>
<tr>
<th>no</th>
<th>range number</th>
</tr>
</thead>
<tbody>
<tr>
<td>start</td>
<td>start frequency</td>
</tr>
<tr>
<td>stop</td>
<td>stop frequency</td>
</tr>
<tr>
<td>rbw</td>
<td>resolution bandwidth of range</td>
</tr>
<tr>
<td>freq</td>
<td>frequency of peak</td>
</tr>
<tr>
<td>power abs</td>
<td>absolut power in dBm of peak</td>
</tr>
<tr>
<td>power rel</td>
<td>relative power in dBc (related to the channel power) of peak</td>
</tr>
<tr>
<td>delta</td>
<td>distance to the limit line in dB (positive indicates value above the limit, fail)</td>
</tr>
<tr>
<td>limit check</td>
<td>limit fail (pass = 0, fail =1)</td>
</tr>
<tr>
<td>unused1</td>
<td>reserved (0.0)</td>
</tr>
<tr>
<td>unused2</td>
<td>reserved (0.0)</td>
</tr>
</tbody>
</table>
The **MULT CARR ACLR** (Multi Carrier Adjacent Channel Leakage Power Ratio) softkey enables measurement of the multi carrier adjacent channel power.

The analyzer measures the power of the 4 useful channels and of the adjacent channels on the left and right sides. In the default setting, only two adjacent channels are taken into account. Measurement results are displayed beneath the measurement screen.

The ACLR limit check can be enabled or disabled by means of the **ACLR LIMIT CHECK** softkey.

### IEC/IEEE bus command:
:CONFigure:CDPower:MEASurement MCAClr

### Query of results:
This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.

The NO. OF TX CHAN softkey enables the entry of the number of carrier signals to be considered.

Numbers from 1 to 12 can be entered.


The CHANNEL BANDWIDTH softkey opens a table for defining the channel bandwidths for the transmission channels and the adjacent channels.

IEC/IEEE–bus command: POW:ACH:BWID:CHAN 1.28MHz
SENS:POW:ACH:BWID:ACH 1.28MHz
SENS:POW:ACH:BWID:ALT1..11 1.28MHz

The CHANNEL SPACING softkey opens a table for defining the channel spacings of the TX channel and the adjacent channels.

Note: The channel spacing can be set separately by overwriting the table from top to bottom.

IEC/IEEE–bus command: SENS:POW:ACH:SPAC:CHAN 1.6MHz
SENS:POW:ACH:SPAC:ACH 1.6MHz
SENS:POW:ACH:SPAC:ALT1 1.6MHz
SENS:POW:ACH:SPAC:ALT2 2.3MHz

The ACP REF SETTINGS softkey opens a table for selecting the transmission channel to which the adjacent-channel relative power values should be referenced.

TX CHANNEL 1 – 12 Selection of one of channels 1 to 12.
MIN POWER TX CHANNEL The transmission channel with the lowest power is used as a reference channel.
MAX POWER TX CHANNEL The transmission channel with the highest power is used as a reference channel.
LOWEST & HIGHEST CHANNEL

The outer left-hand transmission channel is the reference channel for the lower adjacent channels, the outer right-hand transmission channel that for the upper adjacent channels.

IEC/IEEE–bus command: 
- POW:ACH:REF:TXCH:MAN 1
- POW:ACH:REF:TXCH:AUTO MIN
- POW:ACH:REF:TXCH:AUTO MAX
- POW:ACH:REF:TXCH:AUTO LHIG

The CP/ACP ABS/REL softkey (channel power absolute/relative) switches between absolute and relative power measurement in the adjacent channels.


This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.

The ADJUST SETTINGS softkey automatically optimizes the instrument settings for the selected power measurement (see below). All instrument settings relevant for a power measurement within a specific frequency range (channel bandwidth) are optimized for the selected channel configuration (channel bandwidth, channel spacing):


This softkey behaves as the ACLR LIMIT CHECK softkey in the adjacent channel power measurement – ACLR. Refer there.

This softkey behaves as in the EDIT ACLR LIMIT softkey in the adjacent channel power measurement – ACLR. Refer there.

The function of the softkey is identical to the softkey SWEEP TIME MANUAL in the menu BW.

IEC/IEEE–bus command: SWE:TIM <value>

This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.

This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.
This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.

The POWER MODE sub menu allows to change between the normal (CLEAR/WRITE) and the max hold power mode. In the CLEAR/WRITE mode the channel power and the adjacent channel powers are calculated directly from the current trace. In MAX HOLD mode the power values are still derived from the current trace, but they are compared with a maximum algorithm to the previous power value. The greater value is remained.

IEC/IEEE bus command:
:CALC:MARK:FUNC:POW:MODE WRIT|MAXH

This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.

Menu MEAS - ACLR

The softkey NOISE CORR is since firmware version 3.90 also available in IF or RF power trigger mode.

Menu TRACE

The softkey VIEW freezes the trace.

IEC-Bus-command:
:DISP:WIND:TRAC:MODE VIEW
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