



ROHDE & SCHWARZ

Test and Measurement
Division

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

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History

| Date | Rel Note Rev | Changes |
|-----------------|--------------|---|
| 03. April 2007 | 1 | First revision for R&S FS-K76 Firmware 4.10 |
| 06. August 2007 | 2 | Added R&S FSUP V4.17 |

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 of compatible versions:

| R&S FS-K76 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 |
|---------------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|------------------------|
| 4.10 | 4.10 | 4.11 | 4.15 | - | 4.17 | 4.18 |
| 4.00 | 4.00 | 4.01 | 4.05 | - | - | - |
| 3.90 | 3.90 | 3.91 | 3.95 | 3.96 | 3.99 | - |
| 3.80 | 3.80 | 3.81 | 3.85 | 3.86 | - | - |
| 3.70 | 3.70 | 3.71 | 3.75 | - | - | - |
| 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 | - | - | - |
| 3.30 | 3.30 | 3.31 | 3.35 | - | - | - |
| 3.28 | 3.20 | 3.21 | 3.25 | - | - | - |
| 2.80 | 2.80 | 2.81 | - | - | - | - |
| 2.60 | 2.60 | 2.61 | - | - | - | - |
| 2.40 | 2.40 | 2.41 | 2.45 | - | - | - |
| 2.30 | 2.30 | 2.31 | 2.35 | - | - | - |
| 2.28 | 2.20 | 2.21 | 2.25 | - | - | - |

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.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 |

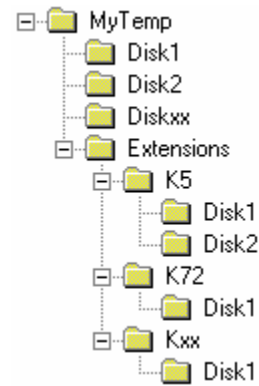
Please make sure that all filenames exactly match with these printed above before you try to use them for the firmware update. Especially the trailing underscore ('_') as used in ikernel.ex_ or _inst32i.ex_ is essential for correct operation of the update program.

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

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).
The instrument will perform several automatic shutdowns, until the new firmware is installed properly.
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.
4. [V3.30/V2.30] The China Wireless Telecommunication Standard “TSM” is supported.
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 Stepsize 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.
14. [V4.00] High Dynamic Mode for Power vs. Time Measurement.
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

START
MEAS

The softkey *START MEAS* starts a single sweep measurement.

IEC-Bus-command:
INIT:CONT OFF;:INIT

HIGH
DYNAMIC

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

HEADER
VALUES

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

Menu MEAS – SPECTRUM EM MASK



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:

```
:CALCulatel:PEAKsearch:AUTO ON | OFF
```

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

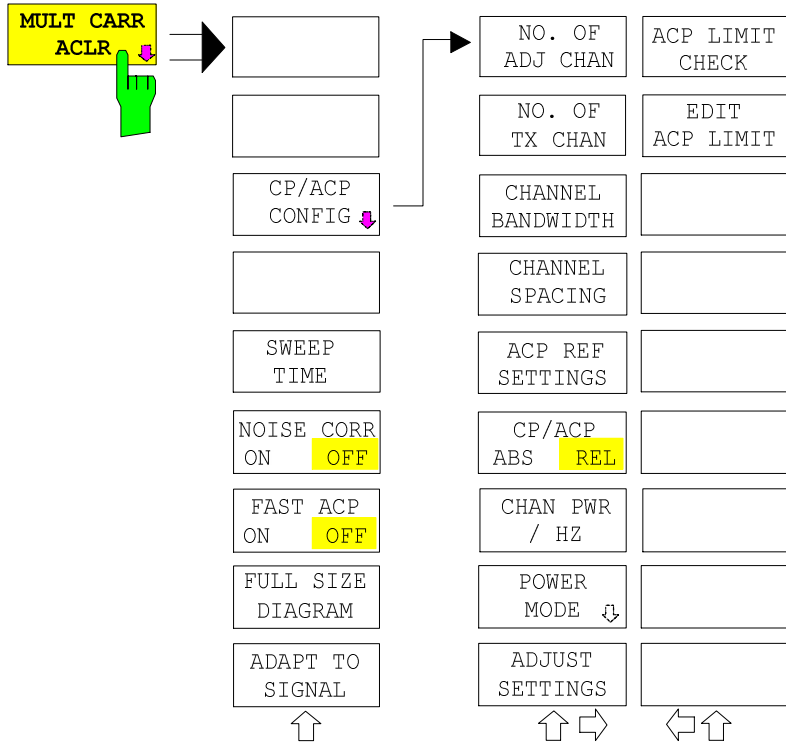
```
TRACel:DATA? LIST
```

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.

| | |
|-------------|---|
| no | : range number |
| start | : start frequency |
| stop | : stop frequency |
| rbw | : resolution bandwidth of range |
| freq | : frequency of peak |
| power abs | : absolut power in dBm of peak |
| power rel | : relative power in dBc (related to the channel power) of peak |
| delta | : distance to the limit line in dB (positive indicates value above the limit, fail) |
| limit check | : limit fail (pass = 0, fail =1) |
| unused1 | : reserved (0.0) |
| unused2 | : reserved (0.0) |

Menu MEAS – MULT CARR ACLR

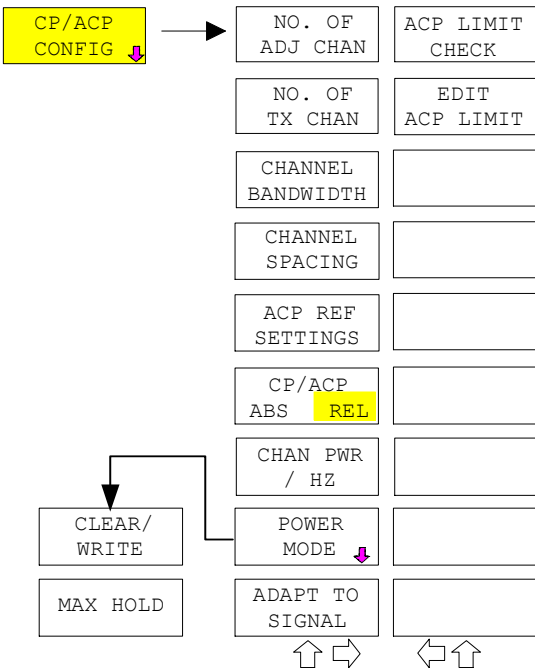


The *MULT CARR ACLR* (Multi Carrier Adjacent Channel Leakage Power Ratio) softkey enables measurement of the multi carrier adjacent channel power.

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: :CALCulate:MARKer:FUNctioN:POWer:RESult? MCACpower
```



The *CP/ACP CONFIG* softkey opens a submenu for configuration of the multi carrier adjacent channel power measurement.

The channel configuration includes the number of channels to be measured, the channel bandwidths (*CHANNEL BANDWIDTH*), and the channel spacings (*CHANNEL SPACING*).

Limit values can additionally be specified for the adjacent-channel power (*ACP LIMIT CHECK* and *EDIT ACP LIMITS*) which are checked for compliance during the measurement.



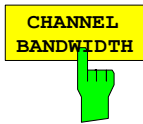
This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.



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

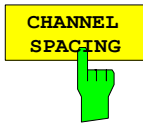
Numbers from 1 to 12 can be entered.

IEC/IEEE–bus command: `SENS:POW:ACH:TXCH:COUN 4`



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

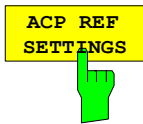
IEC/IEEE–bus command: `POW:ACH:BWID:CHAN 1.28MHz`
`POW:ACH:BWID:ACH 1.28MHz`
`POW:ACH:BWID:ALT1..11 1.28MHz`



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.

| ACP REFERENCE CHANNEL | |
|-------------------------------------|--------------------------|
| <input checked="" type="checkbox"/> | TX CHANNEL 1 |
| <input type="checkbox"/> | TX CHANNEL 2 |
| <input type="checkbox"/> | TX CHANNEL 3 |
| <input type="checkbox"/> | TX CHANNEL 4 |
| <input type="checkbox"/> | TX CHANNEL 5 |
| <input type="checkbox"/> | TX CHANNEL 6 |
| <input type="checkbox"/> | TX CHANNEL 7 |
| <input type="checkbox"/> | TX CHANNEL 8 |
| <input type="checkbox"/> | TX CHANNEL 9 |
| <input type="checkbox"/> | TX CHANNEL 10 |
| <input type="checkbox"/> | TX CHANNEL 11 |
| <input type="checkbox"/> | TX CHANNEL 12 |
| <input type="checkbox"/> | MIN POWER TX CHANNEL |
| <input type="checkbox"/> | MAX POWER TX CHANNEL |
| <input type="checkbox"/> | LOWEST & HIGHEST CHANNEL |

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.

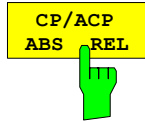
MAX POWER TX CHANNEL

The transmission channel with the highest power is used as a reference channel.

LOWEST & HIGHEST CHANNEL

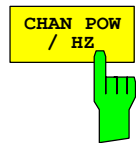
The outer left-hand transmission channel is the reference channel for the lower adjacent channels, the outer right-hand transmission channel that for the upper adjacent channels.

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

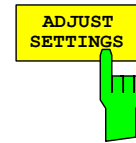


The *CP/ACP ABS/REL* softkey (channel power absolute/relative) switches between absolute and relative power measurement in the adjacent channels.

IEC/IEEE–bus command: POW:ACH:MODE ABS

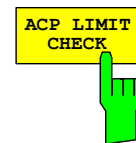


This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.



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):

IEC/IEEE–bus command: POW:ACH:PRES MCAC



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

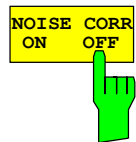


This softkey behaves as in the *EDIT ACLR LIMIT* softkey in the adjacent channel power measurement – ACLR. Refer there.



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

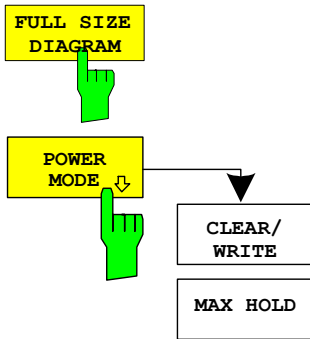
IEC/IEEE–bus command: SWE:TIM <value>



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.

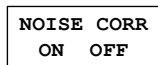
The *POWER MODE* sub menu allows to change between the normal (*CLEAR/WRITE*) and the max hold power mode. In the *CLEAR/WRITE* mode the channel power and the adjacent channel powers are calculated directly from the current trace. In *MAX HOLD* mode the power values are still derived from the current 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



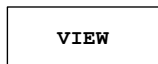
This softkey behaves as in the adjacent channel power measurement – ACLR. Refer there.

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