



ROHDE & SCHWARZ

Test and Measurement
Division

Release Notes

TD-SCDMA Mobile Station Test Application Firmware R&S FS-K77

Release 4.30

for R&S FSP, FSU, FSQ, FSG, FSMR, FSUP
Analyzer Firmware 4.3x

New Features:

- Synchronization to Midamble of Selected Slot (softkey SYNC TO SLOT) for repeater measurements.
- Measurements in presence of the channel DwPCH supported.
- New Softkey RF INPUT AC / DC.
- New Ref Value Y Axis / Reference Level coupling simplifies grid scaling configuration for Code Domain measurements.

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History

Date	Rel Note Rev	Changes
08 April 2008	1	First revision for R&S FS-K77 Firmware 4.20.

General Topics

Compatibility of R&S FS-K77 TD-SCDMA MS Application Firmware

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

Table of compatible versions:

R&S FS-K77 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 FSG Basic Firmware
4.30	4.30	4.31	4.35	-	-	4.39
4.20	4.20	4.21	4.25	-	-	4.29
4.10	4.10	4.11	4.15	-	4.17	-
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	-	-	-
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	-	-	-

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-K77 TD-SCDMA MS Application Firmware

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 analyzer or delivered as a part of the R&S FS-K77 TD-SCDMA MS 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.

New Functions in version 4.30

- **Synchronization to Midamble of Selected Slot (softkey SYNC to SLOT).**

By default the R&S FS-K77 determines the phase reference for all data slots from the midamble of slot 1. For e.g. beamforming or repeater measurements it might be necessary to apply different phase offsets to each time slot. Using slot 1 as phase reference leads to rotated constellation diagrams and bad EVM values in the other time slots.

By activating the new setting 'SYNC TO SLOT' the R&S FS-K77 determines the phase reference from the midamble of the selected slot. Thus the data slots can be phase rotated to each other without degrading the EVM results. The selected slot must contain at least one data channel with sufficient power for successful synchronization.

- **Measurements in presence of the DwPCH.**

TD-SCDMA mobiles in uplink mode do not transmit power during the downlink pilot slot (DwPTS). Up to now the R&S FS-K77 expected the DwPTS to be empty for successful synchronization. However, for measurements on combined downlink and uplink signals it might be necessary to consider power within the DwPTS.

This version of the R&S FS-K77 synchronizes successfully in presence of the downlink pilot channel if also the R&S FS-K76 is available on the instrument.

- **Softkey RF INPUT AC / DC is now available for the application.**

Note: AC /DC coupling is not provided by all instrument models.

- **New Ref Value Y Axis / Reference Level coupling simplifies grid scaling configuration for Code Domain measurements.**

Since version 4.20 the Reference Level and the grid scaling (REF VALUE Y AXIS) with unit dBm can be independently set for Code Domain measurements. In previous versions changing the Reference Level and changing the Ref Value Y Axis were independent. If the Reference Level value is changed the Ref Value Y Axis is now automatically adjusted to keep the difference between Reference Level and Ref Value Y axis constant.

Example:

Ref Level set to 0 dBm

Ref Value Y axis set to -10 dBm (at Y Axis Position 100%)

► The upper Y limit of the grid scaling is now at 10dB below reference level.

Change Reference Level to -10dBm

The Ref Value Y Axis is now adjusted to -20 dB

► The upper Y limit of the grid scaling is at 10 dB below reference level as before.

Note: The internal reference level change with function ADJUST REF LEVEL is treated in the same way.

Modified Functions

1. [V3.50] 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]'.

2. [V3.50] CDP measurement over 11970 consecutive PCGs for R&S FSQ possible (8 seconds of IQ data).

3. [V3.60/V2.60] External trigger level adjustable from 0.5 to 3.5V.

4. [V3.60/V2.60] Center Frequency Stepsize softkey available.

5. [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'.

6. [V3.70/V2.80] ACP: number of adjacent channels increased to 12.

7. [V3.70/V2.80] ACP: power mode to max holds the power results.

8. [V3.80/V2.80] Trace view available within code domain analyzer.

9. [V3.90] Support for noise correction in ACLR measurement with power trigger.

10. [V4.00] Spectrum emission mask: List evaluation in lower screen now supported.

11. [V4.10] High Dynamic Mode for Power vs. Time Measurement.

12. [V4.20] Support for instrument R&S FSG.

13. [V4.20] Softkey REF VALUE Y AXIS available for CDP measurements.

14. [V4.20] Power vs Time: Sweep Mode SINGLE/CONTINUOUS is now restored to it's previous state, when HIGH DYNAMIC is switched off.

15. [V4.30] Synchronization to Midamble of Selected Slot (softkey SYNC to SLOT).

16. [V4.30] Measurements in presence of the DwPCH supported if K76 is enabled.

17. [V4.30] Softkey AC / DC Coupling available.

18. [V4.30] New Ref Value Y Axis / Reference Level coupling simplifies grid scaling configuration for Code Domain measurements.

Since version 4.20 the Reference Level and the grid scaling (REF VALUE Y AXIS) with unit dBm can be independently set for Code Domain measurements. In previous versions changing the Reference Level and changing the Ref Value Y Axis were independent. If the Reference Level value is changed the Ref Value Y Axis is now automatically adjusted to keep the difference between Reference Level and Ref Value Y axis constant.

Example:

Ref Level set to 0 dBm

Ref Value Y axis set to -10 dBm (at Y Axis Position 100%)

► The upper Y limit of the grid scaling is now at 10 dB below reference level.

Change Reference Level to -10dBm

The Ref Value Y Axis is now adjusted to -20 dB

► The upper Y limit of the grid scaling is at 10 dB below reference level as before.

Note: The internal reference level change with function ADJUST REF LEVEL is treated in the same way.

Problems Eliminated

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

1. [V4.20] A Reference Level Offset $\neq 0$ dB is not taken into account when the dialog REF VALUE X AXIS is opened.

A wrong REF VALUE X AXIS is displayed after changing the reference level offset. The problem is only visible on the input dialo. The grid scaling settings are correct. When a new value is entered the reference level is correctly taken into account.

2. [V4.20] ACLR Measurement: Softkeys SWEEPTIME is not visible but described in the manual.

Known Problems

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

1. [V4.10] PvT High Dynamic with IF Power trigger is available.

The IF Power trigger is not supported for PvT High Dynamic but the softkey HIGH DYNAMIC is not disabled, if trigger source IF POWER is selected.

Modifications to the Operating Manual and Supplements

For the R&S FS-K77 TD-SCDMA Mobile Station Test Application Firmware manuals please refer to the following order numbers:

- 1300.7304.44-02 (German/English)

They can be downloaded from R&S internet – search: FS-K77:

<http://www.rohde-schwarz.com>

Modified Chapters for manual operation

Menu SETTINGS - NEXT

SYNC
TO SLOT

By default the R&S FS-K77 determines the phase reference for all data slots from the midamble of slot 1. For e.g. beamforming or repeater measurements it might be necessary to apply different phase offsets to each time slot. Using slot 1 as phase reference leads to rotated constellation diagrams and bad EVM values in the other time slots.

By activating the new setting 'SYNC TO SLOT' the R&S FS-K77 determines the phase reference from the midamble of the selected slot. Thus the data slots can be phase rotated to each other without degrading the EVM results. The selected slot must contain at least one data channel with sufficient power for successful synchronization.

The softkey *SYNC TO SLOT* changes the phase reference from the midamble of slot 1 to the midamble of the selected slot.

IEC/IEEE-bus command:

```
:SENSe:CDPower:STSlot ON | OFF
```

Menu MEAS – POWER VS TIME

START
MEAS

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

IEC/IEEE-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.

The High Dynamic mode uses a digital 2 MHz RBW filter with an outstanding low settling time of about 1 chip duration. The Power vs. Time sweep is divided into a TX on power and a TX off power section. The TX on power section uses reference level and attenuator settings according to the maximum input level, whereas the TX off power section is optimized for a noise power of less than -80 dBm. Each section is averaged over the selected number of subframes. The measurement can be performed in single sweep mode only.

Due to the low reference level, power values above -50dBm are not displayed with the correct magnitude, if they fall into the TX off power section. However, these power values will clearly fail the time mask.

For all Power vs. Time measurements it is mandatory to keep the input power within the instruments specifications. The internal attenuator is set to 0 dB for reference levels below 20 dBm.

If the input power is increased above 20 dBm, the Auto Level & Time routine must be called before starting the measurement. Alternatively an RF attenuation of at least 10 dB can be set manually.

IEC/IEEE-bus command:

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


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.

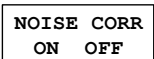
```
TRACel:DATA? LIST
```

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.

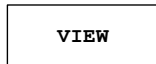
no	: range number	
start	: start frequency	
stop	: stop frequency	
rbw	: resolution bandwidth of range	
freq	: frequency of peak	
power abs	: absolute power in dBm of peak	
power rel	: relative power in dBc (related to the channel power) of peak	
delta	: distance to the limit line in dB (positive indicates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

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/IEEE-bus command:

:DISP:WIND:TRAC:MODE VIEW

Remote Control Commands

:**[SENSe<1|2>:]CDPower:STSLot** ON | OFF

This command selects the phase reference to be used.

By default the R&S FS-K77 determines the phase reference for all data slots from the midamble of slot 1. For e.g. beamforming or repeater measurements it might be necessary to apply different phase offsets to each time slot. Using slot 1 as phase reference leads to rotated constellation diagrams and bad EVM values in the other time slots.

By activating the new setting 'SYNC TO SLOT' the R&S FS-K77 determines the phase reference from the midamble of the selected slot. Thus the data slots can be phase rotated to each other without degrading the EVM results. The selected slot must contain at least one data channel with sufficient power for successful synchronization.

Parameter: ON: Selects the midamble of the selected slot as phase reference.
OFF: Selects the midamble of slot 1 as phase reference.

Example: "SENS:CDP:STSL ON" 'use selected slot as phase reference

Characteristics: *RST value: OFF
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