ROHDE&SCHWARZ

Test and Measurement
Division

Release Notes

Firmware Release 4.67SP7

for R&S FSUP Signal Source Analyzers

with order number: **1166.3505.xx**

New Functions in Signal Source Analyzer V4.67SP6

- When the DUT signal is lost during a VCO characteristics measurement a new search is performed in the DUT frequency range +/- 20%

New Functions in Signal Source Analyzer V4.67/V4.67SP1-4

- FS-K9: Support for Power Sensors R&S NRP-Z211 and R&S NRP-Z221
- Support for new FSQ-K70 V4.61
- The maximum stop offset value for phase noise measurements is now 30 GHz
- The minimum start offset value for residual phase noise measurements is now 0.01 Hz
- Improved tracking of the signal frequency in the phase noise PLL measurement sweep
- Measurement filter may be applied to the residual results calculation
- Additional markers are available in the VCO characteristic measurement modes

New Functions in Spectrum Analyzer and FS-K8/K9 V4.67:

- Auto Login Password for user INSTRUMENT is changed to "894129" for security reasons
- Support for Noise Correction outside of ACP measurement
- Multi Carrier ACP with up to 18 TX Channels
- Multi Carrier ACP now supports save/recall of user standards
- Spurious Emissions Measurement now supports save/recall of user standards
- SEM measurement: Supports for save/recall of user defined standards

Full list of new functions inside the release notes

Release Note Revision: 1

Printed in the Federal
Republic of Germany

Contents

History

Date	Rel Note Rev	Changes
16. June 2016	1	First revision for firmware V4.67SP7

General Topics

Firmware Update

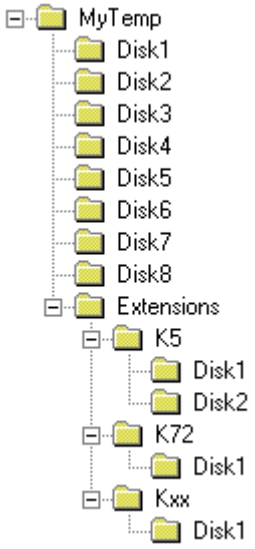
Generation of the update set

Since basic firmware version V4.21 a ZIP file with basic system firmware and the newest available applications is provided. This ZIP file is available in the instruments FIRMWARE section of the Service Board on GLORIS.

Preparing installation via USB stick or LAN:

- Download the update set ZIP file.
- Extract the contents of the ZIP file to a temporary folder, e.g. C:\MyTemp.

  Other files (e.g. release rotes) shall not be stored in these directories. These files would be copied on harddisk and may cause a disk full problem on drive E:.
- Now copy the content of the temporary folder including all sub folders to a USB stick.
- The USB stick is now ready to for performing the update.



Following extension's sub folder are used for the instrument's applications:

- K5
- K30
- K40
- K70
- K72 (includes K73, K74, K74+)
- K76 (includes K77)
- K82 (includes K83)
- K84 (includes K85)
- K110

Performing the firmware update on the instrument

A new method to install the base system and all required applications is available, if the installed base system firmware is V4.11 or newer.
For updating to version 4.11 or newer first update the bases system only to get the new update manager. Then update base system and all applications using the new update manager.

Base System Update from version < 4.11 to 4.11 or newer:
Skip this step, if the installed base system firmware is V4.11 or newer. The firmware update process is performed in the following steps:

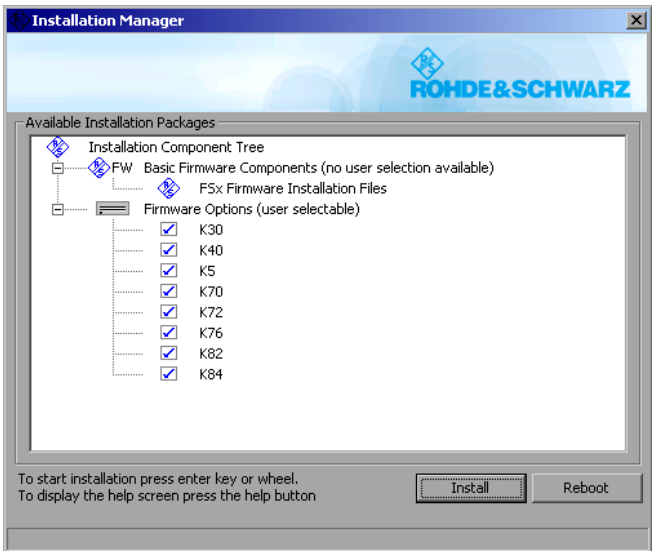
- Switch the instrument on and wait until the Analyzer has resumed operation.
- Use the SETUP | NEXT | FIRMWARE UPDATE | UPDATE PATH softkey to specify any path for the location of the disk directory (e.g. F:\MyTemp).
- Press SETUP → NEXT → FIRMWARE UPDATE
- Confirm the query "Do you really want to update the firmware?" with OK
- 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.**

Complete Update with update manager:

- Use the SETUP | NEXT | FIRMWARE UPDATE | UPDATE PATH softkey to specify any path for the location of the disk directory (e.g. F:\MyTemp).
- Press SETUP → NEXT → FIRMWARE UPDATE
- Confirm the query "Do you really want to update the firmware?" with OK

The *Installation Manager* will terminate the analyzer application, search for available application update set and will show a selection list.



- Deselect applications, not to be installed and start the installation process with INSTALL. REBOOT will abort the update and restart the analyzer application without any changes.
- The instrument will perform several automatic shutdowns, until the new firmware and all applications are installed properly.

  Do not switch the instrument off until the update process has been finished completely.

After a successful firmware update it is necessary to execute the instument's self alignment process by pressing CAL and softkey CAL TOTAL.

Firmware installation of the R&S FS-K7 FM demodulator, R&S FS-K8 BLUETOOTH Analyzer software, R&S FS-K9 Power Sensor Measurement and R&S FSQ-K96 OFDM-VSA

The R&S FS-K7, R&S FS-K8, R&S FS-K9 and R&S FS-K15 application software package are included in the basic instrument firmware. It therefore needs no separate firmware update procedure. The R&S FSQ-K96 is an external PC application. The key code for this needs to be entered into the FSUP as described below.

Enabling these options via option key code entry

This section can be skipped if the option key was entered once.
For activation of these application software packages a license key for validation must be entered. The license key is printed either on a label on the rear panel of the R&S FSU or delivered as a part of the software package.
The key sequence for entering the license key for every option is:

SETUP - GENERAL SETUP – OPTIONS - INSTALL OPTION

Use the numeric keypad to input the option key number and press ENTER.

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

Compatibility to other Firmware Option Packages

The following firmware option packages are available with their own disks and can be installed separately. Please refer to their release notes.

R&S FSUP V4.67SP7 is compatible to the following firmware option releases:

R&S FS-K5	R&S FS-K30	R&S FSQ-K70	R&S FS-K72 FS-K73 FS-K74 FS-K74+	R&S FS-K76 FS-K77	R&S FS-K82 FS-K83	R&S FS-K84 FS-K85
4.60SP1	4.60SP2	4.61	4.61SP1	4.60SP1	4.60SP2	4.60SP1

Hint:
Applications with the version number 3.xx / 4.xx are only compatible with basic firmware 3.yy / 4.yy (see table above).
Do not install application firmware with versions 1.xx or 2.xx on an R&S FSU with basic firmware 3.yy or 4.yy!

New Functions in Version 4.67SP6

The following functions have been added:
Signal Source Analyzer:

- **When the DUT signal is lost during a VCO characteristics measurement a new search is performed in the DUT frequency range +/- 20%**

New Functions in Version 4.67SP4

The following functions have been added:
Spectrum Analyzer:

- **FS-K9: Support for Power Sensors R&S NRP-Z211 and R&S NRP-Z221**
- **Support for new FSQ-K70 V4.61**

New Functions in Version 4.67SP2/SP3

The following functions have been added:
Signal Source Analyzer:

- **The maximum stop offset value for phase noise measurements is now 30 GHz**
- **The remote control command `SENSe:SWEep:POINts?` now works for all measurement modes**

Spectrum Analyzer:

- **New function REGISTRY READ ONLY supported.**

New Functions in Version 4.67/4.67SP1

The following functions have been added:
Signal Source Analyzer:

- **The minimum start offset value for residual phase noise measurements is now 0.01 Hz**
- **Improved tracking of the signal frequency in the phase noise PLL measurement sweep**
- **Measurement filter may be applied to the residual results calculation**
- **Additional markers are available in the VCO characteristics measurement modes**
- **The RF input coupling can now be set from the SSA mode**
- **The command `INIT:NEW` has been added to force a "NEW RUN" in remote control**
- **Overloading the ADC in the PLL mode measurements now generates a warning message**

Spectrum Analyzer:

- **Resolution Bandwidth 6.25 kHz supported (with SP1)**
- **Support for the Status Operation Register Bits MEASuring/SWEeping (with SP1)**
- **Auto Login Password for user INSTRUMENT is changed to "894129" for security reasons**
- **Support for Noise Correction outside of ACP measurement**
- **Multi Carrier ACP with up to 18 TX Channels**
- **Multi Carrier ACP: Support for save/recall of user defined standards**
- **Spurious Emissions Measurement: Support for save/recall of user defined standards**
- **SEM measurement: Supports for save/recall of user defined standards**
- **SEM measurement: Ref Level dialog available to adjust the sweep list's level settings**
- **SEM measurement: Additional WIMAX configuration files available for Downlink ETSI (5MHz / 10MHz)**

- **Extended Marker Peak List function includes automatic peak list update**
- **New functions to temporary disable/enable option license keys.**
- **New remote command "SYSTem:SHUTdown" to shutdown the instrument**
- **New Import/Export function for device specific data (option licence keys).**
- **New Channel Filter 7.5 kHz available.**
- **ACP/Multi Carrier ACP measurement with selectable RRC weighting filter for TX, Adjacent and Alternate Channels.**
- **Occupied Bandwidth Measurement: New remote command to get frequeny and level of the markers T1, T2**
- **Transducer: New function VIEW TRANSDUCER**
- **Trace Export: Additional ASCII File entries "Preamplifier" and "Transducer"**
- **New Remote Status Bit for Overload Trace (OVTRC)**
- **HP emulation: New command "SER?" available to query the serial number**
- **FSU-B21: User Band Harmonic Numbers up to 100 supported.**
- **FSU-B21: Import of conversion loss tables from USB stick supported.**
- **FS-K7: New Fundamental Frequency AUTO/MANUAL setting for SINAD and THD measurement**
- **FS-K7: Maximum Meas Time increased by factor 8 for instruments with a system memory size of ≥ 1GByte.**
- **FS-K9: Power Sensor Duty Cycle correction supported.**
- **FS-K9: Indication of the power meter's serial number**
- **New "Instrument Driver Actuator" in the Windows Start menu**
-

Modified Functions

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

Signal Source Analyzer:

(V4.67SP2) Measurment results between 1 Hz and 10 Hz offset in analyzer phase noise mode have been improved
(V4.67SP2) The LNA Gain is now limited to 20 dB for frequencies below 75 MHz
(V4.67SP2) Display of the LoopBW and limit line text labels has been improved
(V4.67SP2) When a new transducer factor is selected the residual results will be updated immediately

(V4.67SP1) The 500 mA current limit for the Vsupply is shared between the two ports.
(V4.67SP1) Application Setup Recovery has been improved.
(V4.67) The Auto LNA Gain and Auto Loop Bandwidth in PLL locking have been improved.
(V4.67) The loop compensation in phase noise PLL modes has been improved.
(V4.67) Locking speed in PLL modes INT1 and INT3 has been improved.
(V4.67) Spurs may be highlighted on all traces.
(V4.67) Lower limit lines are now available for phase noise measurements.
(V4.67) Changes to the limit lines are now displayed immediately, not after the next measurement is run.
(V4.67). The maximum number of cross-correlations and averages has been increased to 999999.

Spectrum Analyzer:

(V4.67) **LXI Class C Support is now integral part of the base system firmware.**

(V4.67) **It is possible now to read the current marker count state with remote command "CALC:MARK:COUN:STAT?" even if it is not possible to activate the marker count function.**

(V4.67) **CONFIGURE NETWORK: An error message pops up if no LAN cable is connected.**

"NOT CONNECTED" is now visible.

(V4.67) SEM Measurement: Required Number of Sweep Points is not set.

The follow configuration for EUTRA/LTE Uplink needs 30001 sweep points to be set.

- BW_01_4_MHz.xml
- BW_03_0_MHz.xml
- BW_05_0_MHz.xml

The number of sweep points is no automatically adjusted to this value.

Note: The number of sweep points is not set to it's previous value if the SEM measurement is switched off or another SEM standard file is loaded.

(V4.67SP1) The 500 mA current limit for the Vsupply is shared between the two ports..

(V4.67SP1) FS-K9: Support for Power Sensor NRP-Z86 available.

Improvements in V4.67SP7

The version numbers in brackets indicate the version in which the issue was observed for the first time.
Signal Source Analyzer:
(V4.67 SP6) In single sweep mode with a sweep count of n the spurs (dBc) limit lines were only evaluated for the sweeps 1 to n-1. (With a sweep count of 1 the limit line was not evaluated).
This issue is solved.
Spectrum Analyzer:
(V4.67) The analyzer application locks up during fast variation of the Resolution Bandwidth using FFT filter.
This issue is solved.
(V4.67) After recalling certain save sets printing only works after de- and re-selecting the printer.
This issue is solved.

Improvements in V4.67SP6

The version numbers in brackets indicate the version in which the issue was observed for the first time.
Signal Source Analyzer:
(V4.47) For offset frequencies from 1 kHz to 100 kHz the cross correlation algorithm is improved to provide better sensitivitiy.
(V4.67SP1) DC Board part number 1166.2621 only: The LEDs could show misleading states. This issue is solved.

Improvements in V4.67SP3/4.67SP4/4.67SP5

The version numbers in brackets indicate the version in which the issue was observed for the first time.
Signal Source Analyzer:
(V4.47) A sporadic reboot in a continous phase noise measurement may happen. This issue is solved.
(V4.67SP4) Display of frequency values in the Carrier Frequency Offset table is corrected.
(V4.67SP4) Transient measurement now run correctly after recall.
(V4.67) Software resource leak after preset corrected.
(V4.67SP2) Display of 'phase detector overload' corrected. Overload was shown in cases where no overload condition was present.

Improvements in V4.67/V4.67SP1/4.67SP2

The version numbers in brackets indicate the version in which the issue was observed for the first time.
Signal Source Analyzer:
(V4.67SP1) Recalling files from V4.67 and earlier firmware versions would lead to incorrect residual noise settings
(V4.67SP1) The maximum allowed value of the residual evaluation line parameter was incorrect in some cases
(V4.67SP1) Switching from AM to PLL mode measurements while the measurement is running could cause the application to crash
(V4.67SP1) Measuring between 7.999 GHz and 8.0 GHz signal frequency could give incorrect measurement results
(V4.67) The correct smoothing window width was not applied to VIEW mode traces when a measurement was running
(V4.67) The remote control commands SENS:VCO:PDET:VOLT:MIN and SENS:VCO:PDET:VOLT:MAX should be query only
(V4.67) SENS:FREQ:STOP should return the actual stop frequency of the measurement when the frequency is limited by the low pass setting.

(V4.67) The evaluation line x-axis result should match the user setting
(V4.67) An incorrect value for y-axis top was displayed in the amplitude noise and residual phase noise modes
(V4.47) Sending the remote command `FREQ:CENT` immediately followed by `INST:SEL SAN` causes a timeout.
(V4.47) The measured value of the current at VTune2 is displayed incorrectly.
(V4.47) The signal frequency in the residual phase noise EXT mode should not be limited.
(V4.47) Some input signals cause an IFOVL message in phase noise analyzer mode
(V4.47) When toggling traces 4 to 8 from BLANK mode they are set to CLRWR. The traces are now set to VIEW mode.
(V4.47) With B21 external mixer the combined PLL+Sweep mode did not work above 30 MHz offset.
(V4.47) With "Auto DUT premeas" switched off the measurement will not run.
(V4.47) With "Auto DUT premeas" switched off the drift parameter of 0 Hz/s is assumed if no different value had been entered.
(V4.47) The phase noise analyzer measurement does not show the spurs suppression state for the residual results or spot noise values. The text "w/o spurs" is now displayed if spur suppression is active.

Spectrum Analyzer:
(V4.47) Hardcopy configuration: The list of selectable printer devices is empty but a printer driver is installed. This issue is solved.

(V4.37) Marker Function Reference Fixed can not be switched off.
It is not possible to switch off the marker function REFERENCE FIXED after follwing order of key strokes:
- MARKER – REFERENCE FIXED (activates Reference Fixed)
- MKR FCTN – NOISE MEAS (activates Noise Marker)
- MKR FCTN – NOISE MEAS (de activates Noise Marker)

(V4.57) FS-K8: Some results in EDR Spurious Emissions measurement do not include the Reference Level Offset.

(V4.47) The remote command "MMEM:DATA" ignores the default folder, set by "MMEM:CDIR".
The following command sequence should store data in the file 'filenname' in folder d:\user\settings:

```
MMEM:MDIR 'd:\\user\\settings'
MMEM:CDIR 'd:\\user\\settings';*opc?
MMEM:DATA 'filename',#<Blockdaten>
```

The file is created in folder "d:\r_s.fw\instr" instead. The command to change the path had no effect.
Using a filename with path included, works fine, e.g.
MMEM:DATA 'd:\\user\\settings\\filename',#<Blockdaten>.

(V4.47) The operating hour is set to 100.000 hours.

(V4.47) Switching back to the internal LCD display does not work if the single display "MONITOR" is configured during power on and no external monitor is connected.
This problem only occurs for certain display revisions. Press SETUP –SYSTEM INFO – HW INFO. The HWC in line FSUP indicates 01 if this display revision is installed.

(V4.47) FS-K7: The analyzer application crashes if MC Phase measurement is active and traces are read via remote control with certain combinations of instrument settings.
Note: This issue is already fixed in V4.55 SP2

(V4.47) Remote command "STAT:QUES?" returns a wrong CAL state.
The instrument returns the wrong status value for bit 8 (CALibration), if the display is switched off (done by default or after sending the remote command SYST:DISP:UPD OFF).

(V4.17) Mouse clicks on softkeys are ignored.

(V4.17) Application crashed after flowing key strokes: FILE – FILEMANAGER – PREV – ESC -ESC.

(V4.47) Function SGL SWEEP DISP OFF does not reactivate the screen after reaching the end of sweep.

(V4.47) ACP measurement: The ACP measurement does not work, if a Spectrum Emission Mask measurement was active before.
The ACP measurement results are not visible and not valid in that situation.

(V4.47) ACP measurement: Wrong Gated Trigger Settings restored after Gate Adjust.
In case of ACP measurement with active trigger, wrong gated trigger settings are restored after leaving the Gate Settings menu. If you then re-enter the Gate Settings menu afterwards, the GL display line position is located be%fore the GD display line.

(V4.47) ACP measurement: The Fast ACP mode does not support more than 3 adjacent channels.
A bandwidth of 0.000 Hz is indicated for the 3rd Alternate Channel and above.

(V4.47) Gated Statistic Measurements (APD, CCDF) with a number of samples > 100 000 do not work.
Wrong I/Q samples may be taken into account if the gate function is activated and the number of samples is above 100 000.

(V4.47) SEM measurement: A Minimum Peak of -400 dB is displayed.
This issue is caused by a rounding problem concerning measurement results, selected sweep points and graphical resolution.

(V4.47) The sweep is halted after PRESET if the SEM measurement was running before.

(V4.47) SEM Measurement: It is not possible to generate a save set while the measurement is running.
The FILE key is not available now as long as the SEM measurement is not stopped.

(V4.47) SEM Measurement: An active LIST EVALUATION is not correctly restored after leaving the gate Settings menu.
The LIST EVALUATION is erroneously switched off, but the softkey indicates the function being active.

(V4.47) SEM Measurement: Modified SEM configuration files for LTE and WLAN.

(V4.47) Wrong Delta Marker position indicated with an active Frequency Offset.
If the delta marker position is modified by using the knob wheel the marker position input dialog indicates the wrong numerical value. The frequency offset is not correctly taken into account. The delta marker result (frequency/level delta) is correct.

(V4.45) Gated Statistics Measurement: No update of the trace is performed.
It is possible to define gate ranges/number of samples exceeding the available I/Q buffer for this measurement. As a result no valid I/Q samples are available and the therefore the measurement will not terminate. A warning messages "gate period exceeds I/Q capture time" is now displayed.

(V4.47) TRIGGER – GATE SETTINGS: Gate Adjust Sweeptime setting gets lost with menu exit.
The sweeptime to adjust the gate settings is taken from the actual analyzer setting, if the GATE SETTINGS menu is entered. As a result, a previously modified sweeptime for the adjustment is overwritten when the GATE SETTINGS menu is entered next time. A separate sweeptime parameter is available now for the gate settings adjustment.

(V4.47) Analyzer Firmware may lock if the TRACE MATH function is used.
The occurance of this issue depends on the order of setting trace modes and activating the TRACE MATH function.

(V4.47) AUTO RECALL function does not support filenames including spaces.

(V4.47) FSP-B10: Signal drops of up to 2dB are visible for certain combinations of Start-Frequency, Stop Frequency, Sweep Points and Resolution Bandwidth.
This issue is fixed by an additional settling time for the signal generators.

(V4.45) FS-K8: EDR Carrier Frequency Stability and Modulation Accuracy.
The calculation of the initial frequency error has been adjusted to the CBT implementation to minimize differences between both devices. Therefore transition bits of the GFSK header are no longer evaluated.

(V4.47) FS-K72/K73: SEM Measurement: Results read by command TRAC:DATA? LIST depend on the display update state.

The results of the query command TRAC:DATA? LIST depend on the state of the display update (SYST:DISP:UPD ON | OFF). It is dependent on the order of remote commands used to configure the SEM measurement. The values returned with SYST:DISP:UPD ON are correct.

Known Issues

This chapter includes firmware issues related to the basic instrument firmware.
For issues related to option packages R&S FS-Kxx please refer to the corresponding release notes of the individual option package.

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

1) (V3.97SP2) Input sensitivity for certain instruments
For FSUP8 instruments (1166.3505.08) with serial number #100001 and #100002 and for FSUP26 instruments (1166.3505.26) with serial number #100001 to #100008 and #100017 the input sensitivity is reduced by approx. 5 dB. In order to fix this these instruments must be upgraded in R&S service.

2) (V4.37) With some R&S FSUP 1166.3505.09/27 devices with external monitor connected:
After activation the dual display mode in the windows graphic settings the device may lock up.
Workaround: After a reboot the monitor configuration works.

3) (V4.47) Function SGL SWEEP – DISP OFF does not activate the display at sweep end.

4) (V4.47) SEM Measurement: It is not possible to generate a save set while the measurement is running.
Work around: Stop the measurement before using SAVE/RECALL.

5) (V4.47) If the center frequency is changed via remote (SENS:FREQ:CENT) shortly before switching to the spectrum mode (INST:SEL SAN) an UNLOCK can appear.
Work around: Within the remote program first the switch to spectrum mode and then the change to the frequency should happen. Switching to SSA and back to SPECTRUM also solves this issue.

6) (V4.47) FS-K7: FM DEMOD application sometimes locks up in Continuous Sweep mode during readout of measurement results (e.g. marker value, modulation results).
Work around: Perform the measurement (sweep) in Single Seep mode, wait for the sweep end and read the needed results afterwards. Single sweep mode should be prefered for remote operation in most cases. Additional examples are available in the user manual, chapter "Remote Control Programming Examples".
In brief:
Use INIT:CONT OFF to switch to single sweep after entering the option. And use INIT:IMM;*OPC? to perform a synchronized measurement.

Modifications to the Operating Manual

- The order number for the current manual is 1305.2552.12-03.

The corresponding PDF-File is separately available on the service board.

The firmware options FS-Kxx come with their own operating manual and release notes. Please refer to the corresponding release notes for more information on changes to these packages.

Last minute changes to the operating manual

Quick Start Guide – Login

Windows XP requires that users identify themselves by entering a user name and password in a login window. The instrument provides a factory-installed auto login function, i.e. login is carried out automatically in the background. The ID used for auto login has administrator rights. As user name *instrument* (lowercase) is set. The valid password depends on the firmware version installed.

User:	"instrument"	(lower case)	
Password:	"instrument"	(lower case)	< V4.47
	"123456"		V4.47
	"894129"		≥ V4.67

Note: The default password is modified by performing a firmware upgrade. A backgrade to an older firmware version will not restore the old password as it is not known to this firmware version. A password differing from the default value will not be modified during firmware update.

Remote Control – Description of the Status Registers

STATus:OPERation Register

In the CONDition part, this register contains information on which actions the instrument is being executing or, in the EVENt part, information on which actions the instrument has executed since the last reading. It can be read using commands "`STATus:OPERation:CONDition?`" or "`STATus:OPERation[:EVENt]?`".

Bit No.	Meaning
0	**CALibrating** This bit is set as long as the instrument is performing a calibration.
1 to 2	These bits are not used
3	**SWEeping** This bit is set while the instrument performs a sweep. It is supported in analyzer mode only (Full Screen, frequency domain and time domain).
4	**MEASuring** This bit is set while the instrument performs a measurement. It is supported in analyzer mode only (Full Screen, frequency domain and time domain).
5 to 7	These bits are not used
8	**HardCOPy in progress** This bit is set while the instrument is printing a hardcopy.
9	This bit is not used
10	**Sweep Break** This bit is set when end of sweep range is reached (spurious measurement, mode analyzer). Command “INIT:CONM” has to be used to proceed.
11 to 14	These bits are not used
15	This bit is always 0

R&S FS-K7 Extensions

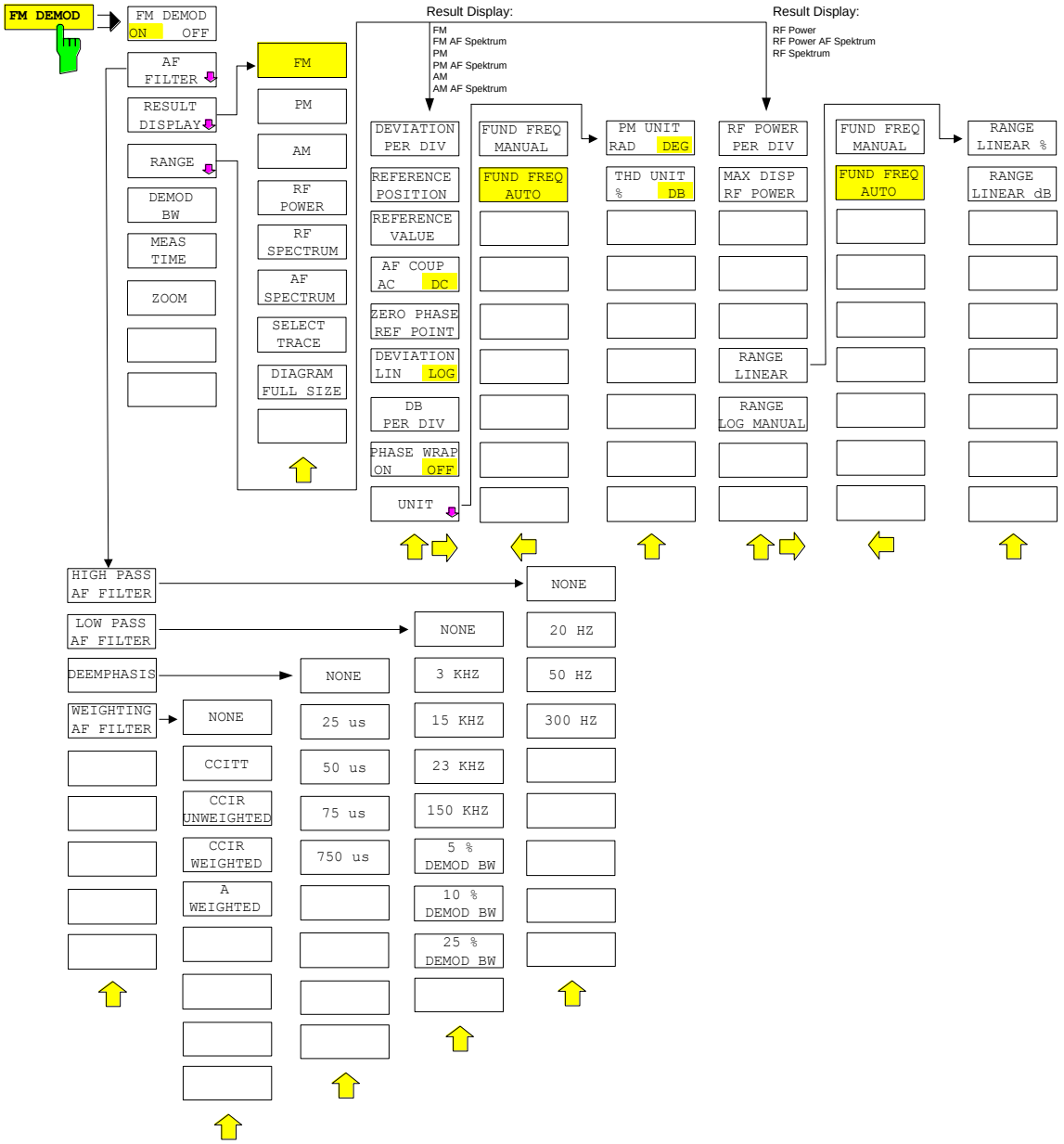
Operating Manual "FM Measurement Demodulator R&S FS-K7":

- 1141.1821.42-06 (English). and
- 1141.1821.41-06 (German)

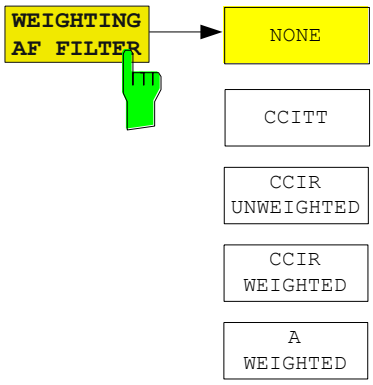
The corresponding PDF-Files are separately available on the service board.

Last minute changes to the R&S FS-K7 operating manual

FM Demodulator Main Menu



Selection of Filter and Deemphasis – AF FILTER Menu



The *WEIGHTING AF FILTER softkey* opens the submenu for selecting the weighting filter.

NONE: Deactivates the weighting filter. This is the default setting.

CCITT: Switches on a CCIT P.53 weighting filter. The weighting filter is active in the following demodulation bandwidth range:

20 kHz ≤ demodulation bandwidth ≤ 3 MHz

CCIR UNWEIGHTED: Switches on the CCIR unweighted filter, which is the combination of the 20 Hz highpass and 23 kHz low pass filter. The weighting filter is active in the following demodulation bandwidth range:

50 kHz ≤ demodulation bandwidth ≤ 1.6 MHz

CCIR WEIGHTED: Switches on the CCIR weighted filter. The weighting filter is active in the following demodulation bandwidth range:

100 kHz ≤ demodulation bandwidth ≤ 3 MHz

A WEIGHTED: Switches on the A weighted filter. The weighting filter is active in the following demodulation bandwidth range:

100 kHz ≤ demodulation bandwidth ≤ 800 kHz

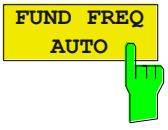
Remote commands:

```
:SENSe:FILTer:CCIR[:UNWeighted][:STATe] ON | OFF
:SENSe:FILTer:CCIR:WEIGhted[:STATe] ON | OFF
:SENSe:FILTer:CCITt[:STATe] ON | OFF
:SENSe:FILTer:AWEighted[:STATe] ON | OFF
```

Menu RANGE – NEXT

The *FUND FREQ MANUAL / FUND FREQ AUTO* softkeys switches between automatic or manual selection of the fundamental frequency used for the SINAD and THD calculations. With automatic selection the peak in the AF spectrum is used as the fundamental frequency.

When switching from AUTO to MANUAL the current modulation frequency result is used as a default if the measurement result is available at this time.



These softkeys are available, if result *AF SPECTRUM* is switched on.

Remote commands:

```
:CALC:ADEM:THD:FREQ:FUND:AUTO ON | OFF
:CALC:ADEM:THD:FREQ:FUND:VALue <numeric value>
```

CALCulate<1|2>:ADEMod:THD:FREQuency:FUNDamental:AUTO[:STATe] ON | OFF

This command switches between automatic or manual selection of the fundamental frequency used for the SINAD and THD calculations. With automatic selection the peak in the AF spectrum is used as the fundamental frequency.

When switching the auto state off, the current modulation frequency result is used as a default for CALC:ADEM:THD:FREQ if the measurement result is available at this time.

This command is available, if Result *AF SPECTRUM* is switched on.

Example:
```
"CALC:ADEM:THD:FREQ:FUND:AUTO OFF"    ' deactivates the auto se-
                                      ' lection and uses the
                                      ' current Modulation Freq.
                                      ' as fundamental frequency.
"CALC:ADEM:THD:FREQ:FUND:VAL 1kHz"    ' set the fundamental
                                      ' frequency.
```

Characteristics: *RST-Wert: ON
SCPI: device-specific

CALCulate<1|2>:ADEMod:THD:FREQuency:FUNDamental:VALue ON | OFF

This command sets the fundamental frequency used for the SINAD and THD calculations.

The query command is available only with "CALC:ADEM:THD:FREQ:FUND:AUTO OFF".

Example:
```
"CALC:ADEM:THD:FREQ:FUND:AUTO OFF"    ' deactivates the auto se-
                                      ' lection and uses the
                                      ' current Modulation Freq.
                                      ' as fundamental frequency.
```

Characteristics: *RST-Wert: ON
SCPI: device-specific

The numeric suffix <1 to 4> at marker is irrelevant with this command.

:SENSe<1|2>:FILTer:AWeighted[:STATe] ON | OFF

This command activates/deactivates the A weighted filter. The weighting filter is active in the following demodulation bandwidth range:
100 kHz ≤ demodulation bandwidth ≤ 800 kHz

Example:
```
":SENS:FILT:AW ON"                    ' activates the A weighted filter
```

Characteristics: *RST-Wert: OFF
SCPI: device-specific

The numeric suffix <1|2> is irrelevant with this command.

:SENSe<1|2>:FILTer:CCIR[:UNWeighted][:STATe] ON | OFF

This command activates/deactivates the CCIR unweighted filter which is the combination of the 20 Hz highpass and 23 kHz low pass filter. The filter is active in the following demodulation bandwidth range:
50 kHz ≤ demodulation bandwidth ≤ 1.6 MHz

Example:
```
"SENS:FILT:CCIR ON"                   ' activates the unweighted CCIR filter
```

Characteristics: *RST-Wert: OFF
SCPI: device-specific

The numeric suffix <1|2> is irrelevant with this command.

:SENSe<1|2>:FILTer:CCIR:WEIGhted[:STATe] ON | OFF

This command activates/deactivates the CCIR weighted filter. The filter is active in the following demodulation bandwidth range:

100 kHz ≤ demodulation bandwidth ≤ 3 MHz

Example: "SENS:FILT:CCIR:WEIG ON" ' activates the weighted CCIR filter

Characteristics: *RST-Wert: OFF
SCPI: device-specific

The numeric suffix <1|2> is irrelevant with this command.

R&S FS-K9 Extensions

In addition to the normal function of *MEAS->REF* and *REFERENCE VALUE* softkeys the unit of the power sensor display is changed from the absolut unit dBm or Watt to the relative unit dB or %. Use the *UNIT/SCALE* key if absolute units are required again.

Software Manual "Measurements with Power Sensors, Application Firmware R&S FS-K9":

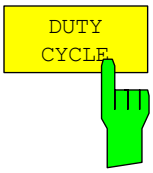
- 1157.3029.42-04 (English). and
- 1157.3029.44-04 (German)

The corresponding PDF-Files are separately available on the service board.

Last minute changes to the R&S FS-K9 operating manual

None.

Menu PWR METER - NEXT

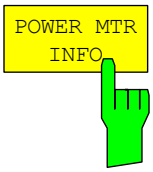


The DUTY CYCLE softkey opens a dialog to set the duty cycle to a percent value for the correction of pulsemodulated signals. With the correction activated, the sensor calculates the signal pulse power from this value and the mean power. The softkey is highlighted if the correction is switched on.
Press the softkey again to switch the Duty Cycle correction off.

Valid entries are from 0.001 % to 99.999%; the stepsize is 0.1 %; the maximum resolution for numerial entries is 0.001 dB. The default setting is 99.999%

Remote command:

SENSe1:PMETer:DCYCle:STATe ON | OFF
SENSe1:PMETer:DCYCle: VALue 0.001 … 99.999 PCT



The POWER MTR INFO softkey open a list showing details of the power sensor:

POWER METER INFO	
Type	NRP-Z11
Serial Number	100057
Order Number	1138.3004.02

Remote command: -

:[SENSe<1|2>:]PMETer:DCYCle:STATe ON | OFF

This command controls the calculation of the signal pulse power from the mean power. The duty cycle has to be set by SENS:PMET:DCYC:VAL according to characteristics of the input signal if the calculation is switched on.

Example:
```
":SENS:PMET:STAT ON"          ' activate power meter
":SENS:PMET:DCYC:STAT ON"     ' switch the correction on
":SENS:PMET:DCYC:VAL 50.0"    ' set the duty cycle to 50 %
```

Properties:
*RST value: OFF
SCPI: device-specific

:[SENSe<1|2>:]PMETer:DCYCle:VALue 0.001 … 99.999

This command sets the duty cycle to a percent value for the correction of pulsemodulated signals. With the correction activated (SENS:PMET:DCYC:STAT ON), the sensor calculates the signal pulse power from this value and the mean power. Valid entries are from 0.001% to 99.999%; the stepsize is 0.1%; the maximum resolution for numerial entries is 0.001%. The default setting is 99.999%

Example:
```
":SENS:PMET:STAT ON"          ' activate power meter
":SENS:PMET:DCYC:STAT ON"     ' switch the correction on
":SENS:PMET:DCYC:VAL 50.0"    ' set the duty cycle to 50 %
```

Properties:
*RST value: 99.999 PCT
SCPI: device-specific

Customer Support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz equipment, contact one of our Customer Support Centers. A team of highly qualified engineers provides telephone support and will work with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz equipment.

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Europe, Africa, Middle East
Phone +49 89 4129 12345
customersupport@rohde-schwarz.com

North America
Phone 1-888-TEST-RSA (1-888-837-8772)
customer.support@rsa.rohde-schwarz.com

Latin America
Phone +1-410-910-7988
customersupport.la@rohde-schwarz.com

Asia/Pacific
Phone +65 65 13 04 88
customersupport.asia@rohde-schwarz.com