

New Instrument  
Password  
"894129"



**ROHDE & SCHWARZ**

Test and Measurement  
Division

## Release Notes

# Firmware Release 4.50 (XP)

with Service Pack 5

**for R&S FSP Spectrum Analyzers**

with order number: **1164.4391.xx**

### New Features:

- New auto login Password for user INSTRUMENT "894129"
- 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).
- ACP/Multi Carrier ACP measurement with selectable RRC weighting filter for TX, Adjacent and Alternate Channels.
- Occupied Bandwidth Measurement: New remote command to get frequency 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
- FSP-B21: User Band Harmonic Numbers up to 100 supported.
- FSP-B21: Import of conversion loss tables from USB stick supported.
- FS-K9: Power Sensor Duty Cycle correction supported.
- New "Instrument Driver Actuator" in the Windows Start menu
- Remote Control: Support for Status Operation Register Bits MEASuring / SWEeping
- FSP-B10: additionally supports HP83620, SMB100A12, SMB100A20 and SMB100A12

Release Note Revision: 7

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## History

<b>Date</b>	<b>Rel Note Rev</b>	<b>Changes</b>
21 January 2010	1	First revision for V4.50.
28 January 2010	2	Improvement item added.
30 March 2010	3	Improvements with Service Pack 1 added.
13 December 2010	4	Improvements with Service Pack 2 added.
31 January 2011	5	Improvements with Service Pack 3 and known issue concerning FS-K8 added.
15 February 2011	6	New functions and improvements with Service Pack 4 added, new chapter Customer Support.
25 May 2012	7	New functions and improvements with Service Pack 5 added.

# General Topics

## Firmware Update

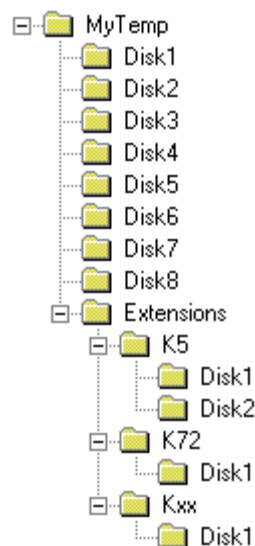
Since basic firmware version V4.20 a ZIP file with basic system firmware and the newest available applications is provided. This ZIP file is available in the instruments FIRMWARE section of the Service Board on GLORIS.

### 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 notes) 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
- K72 (includes K73)
- K76 (includes K77)
- K82 (includes K83)
- K84 (includes K85)
- K90
- K92 (includes K93)



### 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 V4.10 or newer. For updating to version 4.10 or newer first update the bases system only to get the new update manager. Then update the base system and all applications using the new update manager.

**Base System Update from version < 4.10 to 4.10 or newer:**

Skip this step, if the installed base system firmware is V4.10 or newer. The firmware update process is performed in the following steps:

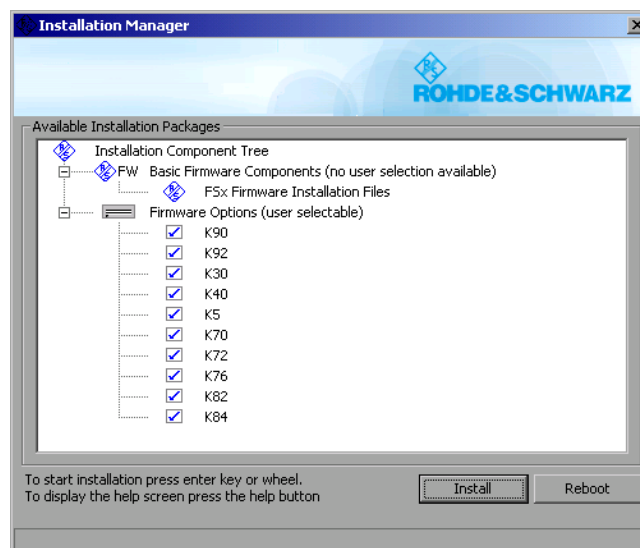
- Switch the instrument on and wait until the Analyzer has resumed operation.
- Use the SETUP | NEXT | FIRMWARE UPDATE | UPDATE PATH softkey to specify any path for the location of the disk directory (e.g. F:\MyTemp).
- Press SETUP → NEXT → FIRMWARE UPDATE
- Confirm the query "Do you really want to update the firmware?" with OK.
- Confirm the copy process.
- The instrument will perform several automatic shutdowns, until the new base system 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 instrument's self alignment process by pressing CAL and softkey CAL TOTAL.

## Known problems during firmware update

### Firmware update with FSP-B20 (flash disk):

At the final step of the setup, backup files are stored for the 'Analyzer Firmware Backup' (option during the start-up of the instrument). This backup is only available for analyzers equipped with hard discs. Therefore an error message "Add folder icon failed" occurs twice if the FSP-B20 is installed.

Workaround: Accept that message via the 'OK' button twice. The firmware update will continue without any problem! This problem is solved with version 3.50 or later.

### Messagebox: Can't open front panel driver, errorcode=0x2

For some constellations this messagebox occurs after the last reboot of the device. In that case:

- Switch the instrument off by pressing the ON/standby switch at the front panel.
- Switch the power off at the rear panel.
- Wait until the Standby LED on the front panel turns from yellow to black (off).
- Switch the power on at the rear panel.
- Switch the instrument on by pressing the ON/standby switch at the front panel.

If the message box still appears, connect an external keyboard and select the "Instrument Driver Actuator" from the Windows Start Menu.

### Downgrade of version V3.60 (or later) to versions below V3.60 (only if FS-K40 or FSP-K90 is installed):

#### 1<sup>st</sup> solution

Before downgrading version V3.60 (or later) to a version below V3.60 and FS-K40 or FSP-K90 is installed on the instrument, the following directories have to be removed (e.g. with FILE - FILE MANAGER) **before** starting the downgrade:

*D:\R\_S.FW\Update\Extensions\K40 and  
D:\R\_S.FW\Update\Extensions\K90*

After deletion of those directories the FS-K40 or FSP-K90 which are compatible to the downgraded base system version needs to be installed as well.

Without deleting both directories the downgrade version of FS-K40 or FSP-K90 will be deleted during installation process due to version conflicts.

#### 2<sup>nd</sup> solution

A second possibility is to downgrade the base system, FS-K40 and FSP-K90 during the **same** installation step. Use the feature to answer YES when the message box 'Do you want to install an option firmware' appears, and insert the discs of the compatible downgrade option, or change the UPDATE PATH to another directory where the option update disk set is located. With this solution no manual deletion of directories is necessary.

## Firmware installation of the R&S FS-K7 FM demodulator, R&S FS-K8 BLUETOOTH Analyzer software and R&S FS-K9 power sensor measurement

The R&S FS-K7, R&S FS-K8 and R&S FS-K9 application software packages are included in the basic instrument firmware. It therefore needs no separate firmware update procedure.

### 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 FSP 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 they must be installed separately. Please refer to their release notes.**

R&S FSP V4.50 SP5 is compatible to the following firmware option releases:

R&S FS-K5	R&S FS-K30	R&S FS-K40	R&S FS-K72 FS-K73 FS-K74	R&S FS-K76 FS-K77	R&S FS-K82 FS-K83	R&S FS-K84 FS-K85	R&S FSP-K90	R&S FSP-K93
4.50	4.51	4.50 SP1	4.50 SP1	4.50	4.50	4.50	4.50	4.50

### **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 FSP with basic firmware 3.yy or 4.yy!*

## New Functions in Version 4.50

- Auto Login Password for user INSTRUMENT is changed to "894129" for security reasons (with Service Pack 2).
- 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).
- Trace Export: Additional ASCII File entries "Preamplifier" and "Transducer"
- ACP/Multi Carrier ACP measurement with selectable RRC weighting filter for TX, ACP and ALT channels.
- Occupied Bandwidth Measurement: New remote command to get frequency and level of the markers T1, T2
- Transducer: New function VIEW TRANSDUCER available
- New Status Bit for Overload Trace (OVTRC) in the STATus:QUEStionable:POWer Register
- HP emulation: New command "SER?" available to query the serial number
- New "Instrument Driver Actuator" in the Windows Start menu
- FS-K9: Power Sensor Duty Cycle correction supported.
- FSP-B21: User Band Harmonic Numbers up to 100 supported.
- FSP-B21: Import of conversion loss tables from USB stick supported.
- LXI Class C Support is now integral part of the base system firmware.  
No extra LXI installation package is required now.
- Support for the Status Operation Register Bits MEASuring/SWEeping (with Service Pack 4)
- FSP-B10: additionally supports HP83620, SMB100A12, SMB100A20 and SMB100A12 (with Service Pack 5).

## Improvements

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

1. (V4.40) **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).  
Note: This issue is already fixed in V4.40 SP2.
2. (V4.40) **Remote command "MMEM:DATA" ignores the current folder, previously set with "MMEM:CDIR".**
3. (V4.10) **Mouse clicks on softkeys are ignored.**
4. (V4.10) **Application crashed after flowing key strokes:FILE – FILEMANAGER – PREV – ESC – ESC.**
5. (V4.40) **Function SGL SWEEP DISP OFF does not reactivate the screen after reaching the end of sweep.**



6. (V4.40) **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.  
Note: This issue is already fixed in V4.40 SP1.
7. (V4.40) **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 before the GD display line.
8. (V4.40) **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.  
Note: This issue is already fixed in V4.40 SP1.
9. (V4.40) **ACP measurement: The Fast ACP mode does not support more than 3 adjacent channels.**  
A bandwidth of 0.000 Hz is indicated for the 3<sup>rd</sup> Alternate Channel and above.
10. (V4.40) **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.  
Note: This issue is already fixed in V4.40 SP1.
11. (V4.40) **SEM measurement: A Minimum Peak of -400 dB is displayed.**  
This problem is caused by a rounding problem concerning measurement results, selected sweep points and graphical resolution.  
Note: This issue is already fixed in V4.40 SP1.
12. (V4.40) **The sweep is halted after PRESET if the SEM measurement was running before.**
13. (V4.40) **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.
14. (V4.40) **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.
15. (V4.40) **SEM Measurement: Modified SEM configuration files for LTE and WLAN.**
16. (V4.40) **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.
17. (V4.40) **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.
18. (V4.40) **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.
19. (V4.40) **Analyzer Firmware may lock if the TRACE MATH function is used.**  
The occurrence of this issue depends on the order of setting trace modes and activating the TRACE MATH function.
20. (V4.40) **AUTO RECALL function does not support filenames including spaces.**

- 21. (V4.40) 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.
- 22. (V4.30) FS-K5: Unexpected change of the center frequency with option B25 installed.**  
The center frequency is modified after the following sequence:
- Switch on the preamplifier
  - Enter GSM
  - Set Center Frequency to 1.88 GHz
  - Set Demod Setting – Modulation Type to EDGE
  - Perform AUTO LEVEL & TIME
  - Select MODULATION ACCURACY
  - Select MODULATION SPECTRUM
- 23. (V4.40) 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.  
Note: This issue is already fixed in V4.40 SP2.
- 24. (V4.40) 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.
- 25. (V4.40) Spurious Signal at 12.8 MHz eliminated.**
- 26. (V4.40) The remote command "MMEM:DATA" ignores the default folder, set by "MMEM:CDIR".**  
The following command sequence should store data in the file 'filename' 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>.

## Improvements with Service Pack 1

Service Pack 1 corrects the following issues. The version numbers in brackets indicate the version in which the issue was observed for the first time.

- 1. (V4.40) The analyzer application crashes if the external tracking generator (FSP-B10) is switched on, the Gated Sweep is active and the Gate Adjust softkey is pressed.**
- 2. (V4.50) ACP Measurement: Wrong power measurement values are displayed if the recall of a save set with active noise correction is performed and the noise correction is switched off afterwards.**
- 3. (V4.50) The operating hour is set to 100.000 hours.**  
**Note:** The firmware is able to repair the 100 000 hour setting if the analyzer is switched on for more than 11 minutes.

## Improvements with Service Pack 2

Service Pack 2 corrects the following issues. All previous service packs are included.

1. (V4.50) **The automatic activation/deactivation of an external monitor sometimes switches the internal LCD display off.**

This issue depends on the graphic resolution capabilities of the external monitor.

## Improvements with Service Pack 3

Service Pack 3 corrects the following issues. All previous service packs are included.

1. (V4.50 SP2) **The analyzer application shows a black window after firmware update.**

This issue does not occur with the latest Windows XP image version.

2. (V4.50 SP1) **An option is disabled after reboot.**

Since version 4.5x it is possible to enable / disable a option key code in dialog SETUP – GENERAL SETUP - OPTIONS. This state change sometimes gets lost after reboot of the instrument.

3. (V4.50 SP1) **The remote command "\*OPT?" does not report option B29.**

This issue occurs if a trial period option key is installed.

## Improvements with Service Pack 4

Service Pack 4 corrects the following issues. All previous service packs are included.

1. (V4.50) **The remote command "SYSTem:DISPlay:UPDate ON | OFF" is not available if the Spectrum Emission Mask Measurement or the Spurious measurement is switched on.**

## Improvements with Service Pack 5

Service Pack 5 corrects the following issues. All previous service packs are included.

1. (V4.50 SP4) **Hardcopy configuration: The list of selectable printer devices is empty but a printer driver is installed.**

## Known Issues

This chapter includes firmware issues related to the basic instrument firmware.

For problems 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. (V4.50) **FS-K8: Some results in EDR Spurious Emissions measurement do not include the Reference Level Offset.**

**Work around:** Use negative Antenna Gain instead of Reference Level Offset to include the offset of an external attenuator.

## Modified Functions

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

1. (V3.00) **Hardcopy screen comment changed to one comment, not one per screen.**
2. (V3.30) **Change to SMR setting files for external generator control:**  
This change enables significant improvements in frequency settling with logarithmic frequency step sizes.
3. (V3.40) **Active transducer and adjust reference level procedure:**  
If transducers are active and the adjust reference level procedure (in measurements like ACP, occupied bandwidth, signal statistics, etc.) is invoked, the *REFLVL ADJ AUTO/MANUAL* of the SETUP - TRANSDUCER menu is set to AUTO thus the best dynamic performance is obtained.
4. (V3.60) **Marker peak list in continuous sweep mode**  
In continuous sweep mode the marker peak list is not any longer executing a single sweep and then peak list search, but the peak list will immediately work on the current trace. This allows peak list functionality on averaged or max held traces in continuous sweep mode. The single sweep mode is unchanged.
5. (V3.60) **RS232 serial remote control**  
Since version 3.60 the instrument goes in remote mode rather than in local mode when a command is send through the RS232 remote interface. This means the display disappears and the LOCAL softkey appears as when the GPIB bus is used. To change between local and remote mode the commands @LOC and @REM can be send to the instrument.
6. (V3.70) **Harmonic measurement**  
The mixer level within the harmonic measurement is changed to -10 dBm.  
The value update in the lower screen happens during the sweep and not only at sweep end.
7. (V3.80) **Modifications to HP commands**
  - Command IP resets format to O3
  - Reading a trace with TRA; TRB or TRC is possible even if trace is blank
  - Great changes of span (e.g. form 2GHz to 100KHz) will not lost signal when marker track is on.
8. (V3.90) **CCDF measurement result table extended by 0.01% value.**
9. (V3.90) **New marker functions AUTO MAX PEAK and AUTO MIN PEAK.**
10. (V3.90) **HP emulation: HP Models 71100C, 71200C and 71209A are using 800 sweep points**
11. (V4.00) **Additional number of sweep points 201, 401, 801 and 1601.**
12. (V4.00) **HP emulation: Additional models 8568A\_DC and 8568B\_DC using DC coupling.**
13. (V4.00) **HP emulation: GENERAL SETTINGS - GPIB menu extended by IF GAIN NORM / PULS.**
14. (V4.00) **New spurious emissions measurement LIST EVALUATION available.**
15. (V4.00) **FS-K7: The THD Unit is selectable (dB / %) in the AM signal / AF spectrum result.**
16. (V4.00) **New function MARKER FILE EXPORT.**
17. (V4.00) **Signal Track: Enhanced sensitivity in marker tracking function.**  
The marker is now set to the signal peak after very single sweep. In previous versions, this only happened if the difference between signal peak and center frequency exceeded 20 % of the Resolution Bandwidth.
18. (V4.00 SP1) **Support for CPU board 1091.2895.**
19. (V4.10) **Improved Firmware Update.**

20. (V4.10) New enhancement label to indicate filter type.
 

|     |                  |
|-----|------------------|
| 3DB | Gauss filter 3dB |
| 6DB | EMI filter 6dB   |
| FFT | FFT filter       |
| CHN | Channel filter   |
| RRC | RRC filter       |
21. (V4.10) Gated statistics measurements APD, CCDF.
22. (V4.10) FS-K8 Enhanced Data Rate (EDR) supported.
23. (V4.10) Support for Power Sensor NRP-Z81 is available.
24. (V4.10) GPIB: Basic remote control of the signal generator which is connected to the additional FSP-B10 GPIB Interface.
25. (V4.10) GPIB: New commands available
 

|                                             |                               |
|---------------------------------------------|-------------------------------|
| :[SENSe<1 2>:]CORRection:TRANsducer:ACTive? | returns active transducer     |
| :CALCulate<1 2>:LIMit<1...8>:ACTive?        | returns active limit line(s). |
26. (V4.10) Trigger Line for video trigger is now also visible outside of the trigger menu.
27. (V4.10) HP emulation: The OL command returns the mixer level in byte 23.
28. (V4.10) HP emulation: The commands MKPK NH | NL | NR and KSK do not perform a sweep start when marker is already switched on.
29. (V4.10) HP emulation: The commands SNGLS and CONTS are setting the command complete bit (bit 4) in STB.
30. (V4.10) HP emulation: New softkey SETUP - GENERAL SETUP - GPIB - SWEEP REP ON/OFF".
31. (V4.10) HP emulation: New commands: VARDEF, CTA, ADD, SUB, MPY, DIV.
32. (V4.10) HP emulation: New command NORMLIZE for tracking generator.
33. (V4.10) HP emulation: The command LF performs a reset.
34. (V4.10) LXI Class C support.
35. (V4.10) Support for FSP-K93.
36. (V4.20) Easy access to Windows XP Start menu.
37. (V4.20) Required sweeptime reduced for video bandwidth < resolution bandwidth.
38. (V4.20) ASCII Export function for Marker Peak List.
39. (V4.20) Adjustable marker position knob stepsize.
40. (V4.20) New trace average function Power.
41. (V4.20) HP emulation: Personality Spurious supported.
42. (V4.20) HP emulation: Personality Phase Noise supported.
43. (V4.20) FSP-B10: Upper frequency limit of SMF100A is now 43.5 GHz.
44. (V4.20) The Acquisition Time (for FFT filter) is now readable with remote command SENS:SWE:TIME?".
45. (V4.20 SP1) FSP-B10: Support for SMA100, SMB100 (1/2/3/6GHz), SMF (22/43GHz) SMJ (3/6GHz).
46. (V4.20 SP1) FSP-B10: Support for SMF100a - TTL mode.
47. (V4.20 SP1) FSP-B21 with Order Number 1157.1758.03 supported.
48. (V4.20 SP1) For local lockout the alias remote command SYSTem:KLOCK ON | OFF is provided.
49. (V4.30) International keyboard driver package supported (German, Spanish, French, Italian and Portuguese).

- 
- 50. (V4.30) **New dialogs available for file/path selection (e.g. for Trace Export, Firmware Update Path).**
  - 51. (V4.30) **ACP: Extended upper limits for Channel Bandwidth (5GHz) and Channel Spacing (20GHz).**
  - 52. (V4.30) **ACP: Overlapping Adjacent Channels allowed now for parallel measurements.**  
 It is now possible to configure overlapping adjacent channels. Based on a common carrier channel setting, it is now possible to measure with two slightly different ADJ channel settings with one measurement.  
 Example: TX Channel / TX Bandwidth (common for both measurement A and B)  
           ADJ used for measurement A  
           ALT1 used for measurement A  
  
           ALT2 used as ADJ for measurement B  
           ALT3 used as ALT1 for measurement B
  - 53. (V4.30) **ACP Measurement: Result output format changed for number of ADJ channels > 3.**
  - 54. (V4.30) **Additional soft keys are available to change the LAN configuration.**
  - 55. (V4.30) **Save dialog reports a warning, if no item to save is selected.**
  - 56. (V4.30) **The increment behaviour of the step keys for parameter SWEEP POINTS is changed.**  
 The behaviour of the knob wheel still has the highest possible resolution.
  - 57. (V4.30) **Dummy Video Bandwidth 0 Hz returned for active FFT filter.**
  - 58. (V4.30) **Availability changed for Spurious Measurement.**  
 The Spurious Measurement is not available if the ACP measurement is active.
  - 59. (V4.30) **HP emulation: Additional remote commands are supported.**  
 The following commands are supported: ML, MEAS, SUM, LIMIPURGE, EDITLIML, LIMIREL, SDEL, SADD, LIMF, LIMU, LIML, LIMM, LIMD, LIMTFL, LIMTSL, SDON, EDITDONE, LIMISAV, LIMIRCL, LIMITEST, LIMIFAIL
  - 60. (V4.30) **HP emulation: A new softkey COUPLING FSP/HP is now available to change the Span/RBW and RBW/VBW default coupling.**
  - 61. (V4.30) **HP emulation: The default for Sweep Repeat is now OFF for 856x and 859x.**
  - 62. (V4.30) **FSP-B9: The number of sweep points allowed in analyzer mode is now supported in NETWORK mode, too.**
  - 63. (V4.30) **FS-K7: Deemphasis is now additionally supported for active Weighting AF Filter CCTT and CCIR.**
  - 64. (V4.30) **Support for new option 3GPP HSPA+ Application Firmware R&S FS-K74+ is available.**
  - 65. (V4.30) **Application Setup Recovery restores previous settings after application exit.**
  - 66. (V4.40) **Configurable Spectrum Emission Mask measurement is available in analyzer mode.**
  - 67. (V4.40) **ACP measurement: User definable standards available.**
  - 68. (V4.40) **ACP measurement: New standards for E-UTRA / LTE.**
  - 69. (V4.40) **External Reference: New "Fall Back to Internal" mode EXT [INT] is available.**
  - 70. (V4.40) **TOI Measurement: New TOI marker search function added (TOI MKR CALC/SRCH).**
  - 71. (V4.40) **Additional overload indication OVTRC is available.**
  - 72. (V4.40) **TRAC:IQ sub system: New remote command TRAC:IQ:DATA:FORMAT.**
  - 73. (V4.40) **Auto Login Password is changed for user instrument to "123456".**  
 It is now possible to enter the password after remote desktop connection by the front panel.

74. (V4.40) **General Setup: Baudrate 19200 for the serial COM interface is now selectable.**
75. (V4.40) **Harmonic Measurement: Additional remote command to get the used resolution bandwidth settings:**  
CALCulate1:MARKer1:FUNCTION:HARMonics:BANDwidth[:LIST]?
76. (V4.41) **FS-K9: Support for Power Sensor NRP-Z28, NRP-Z56, NRP-Z57, NRP-Z92 and NRP-Z98.**
77. (V4.40) **FSP-B10: Support for SMBV100a, SMA100a and SMB (TTL mode).**
78. (V4.40) **Support for FS-K73+.**
79. (V4.40) **HP emulation**
  - command OL expanded
  - no difference between local and remote sweep points
80. (V4.40) **HP emulation for 8560E, 8561E, 8562E, 8563E, 8564E, 8565E**
  - Spurious Measurement: threshold line is take into account for calculating of resolution bandwidth and noise level, message box "RBW/VBW coupling adjusted" suppressed
  - Harmonic Measurement: modified algorithm for finding harmonics
  - Phase Noise Measurement: some minor adjustments
  - Support of 4 markers
  - Corrections of RBW calculation if FFT-Filter is switched on
  - Command MKNOISE, MKTRACK: correction of return value
  - Sweep time adjusted for gated sweep (command GATE)
81. (V4.40) **HP emulation for 8566A/B, 8568A/B**
  - Support of 4 markers
82. (V4.40) **HP emulation for 8591E, 8594E**
  - sweep time adjusted for gated sweep (command GATE)
83. (V4.50) **New functions to temporary disable/enable option license keys.**
84. (V4.50) **New remote command "SYSTem:SHUTdown" to shutdown the instrument.**
85. (V4.50) **New Status Bit for Overload Trace (OVTRC) in the STATus:QUESTionable:POWER Register.**
86. (V4.50) **New function EXPORT/IMPORT DEV DATA to export and import device specific data (e.g. option licence keys).**
87. (V4.50) **ACP/Multi Carrier ACP with selectable Weighting Filter for TX, ACP and ALT channels supported.**  
Since version 4.5x the following remote commands to not ignore the numeric suffix at CHAN or ALT accordingly.  
SENS:POW:ACH:FILT:STAT:CHAN<1 to 12>  
SENS:POW:ACH:FILT:STAT:ALT<1 to 11>  
SENS:POW:ACH:FILT:ALPH:CHAN<1 to 12>  
SENS:POW:ACH:FILT:ALPH:ALT<1 to 11>
88. (V4.50) **Occupied Bandwidth measurement: New command ":CALC:MARK:FUNC:POW:RES? AOB | AOBW" returns the position and level of marker T1 and T2.**
89. (V4.50) **Transducer: New function VIEW TRANSDUCER available**
90. (V4.50) **Trace Export: Additional ASCII File entries "Preamplifier" and "Transducer"**
91. (V4.50) **HP emulation: New command "SER?" available to query the serial number**
92. (V4.50) **New "Instrument Driver Actuator" in the Windows Start menu**
93. (V4.50) **FSP-B21: Import of conversion loss tables from USB stick supported.**
94. (V4.50) **FS-K8: EDR Spuriuos: Remote Control read access allowed for Span, Start- and Stopfrequency.**

- 95. (V4.50) Gated Statistics Measurement: Additional settings checks added (e.g. if the period time does not fit to the I/Q capture length).
- 96. (V4.50) LXI Class C Support is now integral part of the base system firmware.
- 97. (V4.50 SP2) New function REGISTRY READ ONLY supported.
- 98. (V4.50 SP4) Support for the Status Operation Register Bits MEASuring/SWEeping.
- 99. (V4.50 SP5) FSP-B10: support for HP83620, SMB100A12, SMB100A20 and SMB100A12.

## Modifications to the Operating Manual

The order numbers for the current manual sets are

- 1164.4556.11-04 (German) and
- 1164.4556.12-06 (English).

The corresponding PDF-Files are 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) | < V4.40                 |
|           | "123456"                  | V4.40, V4.50, V4.50 SP1 |
|           | "894129"                  | ≥ V4.50 SP2             |

**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.

### Quick Start Guide – Operating System Properties – Special Links

The windows start menu includes following special links

- *"Instrument Driver Actuator"*  
This link forces Windows XP to reload all instrument specific drivers.  
Use this link if a new hardware is not recognized or a problem with the frontpanel keyboard is reported.
- *"LXI Configuration"*  
This link opens a dialog to enable/disable LXI.
- *"R&S Analyzer Interface"*  
This link starts the analyzer application.



- *"Start – Program – Accessories – Sytem Tools – Activate Registry Readonly"*  
This link activates function REGISTRY READONLY. Handle this function with care!  
This function is only available if the Registry Write Filter package is installed. The installation package is available for Windows XP SP2 or SP3.  
More details see chapter SETUP – GENERAL SETUP.
- *"Start – Program – Accessories – Sytem Tools – Dectivate Registry Readonly"*  
This link deactivates function REGISTRY READONLY.  
This function is only available if the Registry Write Filter package is installed. The installation package is available for Windows XP SP2 or SP3.  
More details see chapter SETUP – GENERAL SETUP.

## Manual Operation

### Menu SETUP – GENERAL SETUP - NEXT

#### REGISTRY READ ONLY

The softkey *REGISTRY READ ONLY* activates/deactivates a write protection for the Windows XP registry. Any modification in the windows registry is cashed into RAM and will get lost after reboot if *REGISTRY READ ONLY* is active.

This function is only available if the Registry Write Filter package is installed. The installation package is available for Windows XP SP2 or SP3.

The active write protection is also indicated in dialog SETUP – SYSTEM INFO – STATISTICS.

**Hint:** In addition, it is possible to deactivate/activate the function with the following links:  
*Start – Programs – Accessories – System Tools*  
*Activate Registry Readonly*  
*Deactivate Registry Readonly*

**Warning:** Do not perform any firmware/driver installation if the **REGISTRY READONLY** function is active! This will result in an incomplete installation.

**Remote command:** ---

## Menu SETUP – GENERAL SETUP – OPTIONS

|       |                 |           |                |
|-------|-----------------|-----------|----------------|
| SETUP | GENERAL SETUP ↓ | OPTIONS ↓ | INSTALL OPTION |
|       |                 |           | REMOVE OPTION  |
|       |                 |           | INSTALL FW EXT |
|       |                 |           | SCROLL OPTIONS |
| SETUP | GENERAL SETUP ↓ | OPTIONS ↓ | INSTALL OPTION |
|       |                 |           | REMOVE OPTION  |
|       |                 |           | INSTALL FW EXT |
|       |                 |           | SCROLL OPTIONS |

A list of installed option license keys is displayed on menu entry.

| FIRMWARE OPTIONS                                     |      |            |            |            |
|------------------------------------------------------|------|------------|------------|------------|
| DESCRIPTION                                          | NAME | CODE       | MIN MEM/MB | MAX MEM/MB |
| ✓FM Demodulator                                      | K7   | 3719832655 | 0.0        | 25.8       |
| ✓Noise Figure V4.50                                  | K30  | 3704742094 | 16.0       | 1.1        |
| ✓WCDMA BTS                                           |      |            | 0.0        | 24.1       |
| WCDMA BTS Analyzer V4.50                             | K72  | 2881325927 | 50.0       | 185.4      |
| Press NEXT PAGE or PREVIOUS PAGE for further options |      |            |            |            |
| Available Memory                                     |      |            |            | 58.3       |

Due to the additional available applications the required resources may exceed the available system memory on instruments shipped with a system memory size below 1GByte. Most applications require additional memory space when once activated. These resources are not released when the application is left to allow a fast re-activation of this application for measurement performance reasons.

Since version 4.5x it is possible to manually enable/disable a license key code once entered, if the required system memory would exceed the available system memory. The applications's hot key will not be visible in the hot key menu if the license key is disabled.

The MIN MEM value lists the additional base system memory required for this application. This part of the memory remains allocated when the application is left and therefore is not available for other applications. The MAX MEM value is the additional worst case memory demand of the application.

The required system memory is the sum of the enabled applications MIN MEM values plus the maximum value of all enabled application's MAX MEM values.

Some applications can not be disabled. The cursor will skip these entries. A few applications are combined to groups and they can only be enabled or disabled as a whole.

If it's not possible to enable a required application there are to ways to save system memory:

- Check whether the application with the maximum MAX MEM value is still required. Disable this application if it is not required to reduce the worst case memory allocation.
- Reduce the base memory allocation by reducing the number of enabled applications with a MIN MEM value unequal to 0.

The available system memory is displayed at the bottom line.

**Note:** You can disable this memory checking by activating the function *EXPERT MODE* (see below).

#### INSTALL OPTION

The *INSTALL OPTION* softkey opens the data entry for the license keycode of a firmware option.

On entry of a valid license key the message *OPTION KEY OK* is displayed in the status line and the firmware option appears in table *FIRMWARE OPTIONS*.

If the license key is accepted, the application is enabled by default. If the required memory exceeds the installed system memory, the application is disabled and you have to disable other applications to free memory resources by disabling other option (see above).

On entry of an invalid license key the message *OPTION KEY INVALID* is displayed in the status line.

**Note:** You do not have to re-enter the option key if the application is temporarily disabled and you want to enable the option key again.

**Remote command:** -

#### REMOVE OPTIONS

The *REMOVE OPTION* softkey removes all firmware options from the instruments.

Execution of this function must be confirmed in a message box in order to avoid removal of the firmware options by mistake.

**Remote command:** -

#### EXPERT MODE

Softkey *EXPERT MODE* allows to switch off the option key memory check.

This function is usefull if all the required applications do not fit into the available system memory, but the worst case settings (concerning memory usage) of the applications is not required for a certain test case.

Example: An application may only need the maximum mermory if a certain function (e.g. FFT calculation) is active. If this function is not used, it is possible to enable an additional application.

**Warning:** The analyzer may crash do to "low memory" conditions if the expert mode is switched on.

**Remote command:** -

REBOOT

Softkey REBOOT performs the shutdown and reboot of the operating system and the analyzer firmware. The reboot will free allocated resources.

**Remote command:** -

PAGE UP  
PAGE DOWN

Using *PAGE UP* and *PAGE DOWN*, you can scroll forward and backward through the Firmware Option List pages.

**Remote command:** -

INSTALL FW EXT

Softkey INSTALL FW EXT opens a dialog to select and start a Firmware Extension Installer MSI File. This softkey is only visible if an application requires an extension of the Windows XP environment.

Due to the installer package size it is not allowed to install these FW Extension Pages on instruments with option FSP-B18 - Removable Harddisk and therefore this softkey is not available in that case.

**Note:** A message window will pop up when an option key code is entered for an application requiring a certain FW Extension Package. After installation of the FW Extension Package the option key has to be entered a second time.

## 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        | <b>CALibrating</b><br>This bit is set as long as the instrument is performing a calibration.                                                                               |
| 1 to 2   | These bits are not used                                                                                                                                                    |
| 3        | <b>SWEeping</b><br>This bit is set while the instrument performs a sweep.<br>It is supported in analyzer mode only (Full Screen, frequency domain and time domain).        |
| 4        | <b>MEASuring</b><br>This bit is set while the instrument performs a measurement.<br>It is supported in analyzer mode only (Full Screen, frequency domain and time domain). |
| 5 to 7   | These bits are not used                                                                                                                                                    |
| 8        | <b>HardCOPy in progress</b><br>This bit is set while the instrument is printing a hardcopy.                                                                                |
| 9        | This bit is not used                                                                                                                                                       |
| 10       | <b>Sweep Break</b><br>This bit is set when end of sweep range is reached (spurious measurement, mode analyzer).<br>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 operating manual**

None.

## **R&S FS-K8 Extensions**

### **Operating Manual "Application Firmware for Bluetooth Measurements R&S FS-K8":**

- 1157.2597.42-03 (English).      and
- 1157.2597.41-03 (German)

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

### **Last minute changes to the R&S FS-K8 operating manual**

None.

## 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 absolute unit dBm or Watt to the relative unit dB or %. Use the *UNIT/SCALE* key if absolute units are required again.

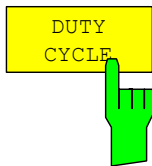
### Software Manual "Measurements with Power Sensors, Application Firmware R&S FS-K9":

- 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

### 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 numerical 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
```

## Remote Control Commands

**:*[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.

|                 |                                                  |                              |
|-----------------|--------------------------------------------------|------------------------------|
| <b>Example:</b> | <code>" : SENS : PMET : STAT ON "</code>         | ' activate power meter       |
|                 | <code>" : SENS : PMET : DCYC : STAT ON "</code>  | ' switch the correction on   |
|                 | <code>" : SENS : PMET : DCYC : VAL 50.0 "</code> | ' set the duty cycle to 50 % |

|                    |             |                 |
|--------------------|-------------|-----------------|
| <b>Properties:</b> | *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 numeral 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.

### Up-to-date information and upgrades

To keep your instrument up-to-date and to be informed about new application notes related to your instrument, please send an e-mail to the Customer Support Center stating your instrument and your wish. We will take care that you will get the right information.

#### Europe, Africa, Middle East

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