Release Notes

Firmware

R&S® SMF100A
Version 2.05.47.34

Printed in the Federal Republic of Germany

Dear Customer,

throughout this manual, R&S SMF is generally used as an abbreviation for the Microwave Signal Generator R&S® SMF100A.

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Table of Contents

1 General information

This document describes the procedure required to apply a firmware update to the Rohde&Schwarz SMF100A Microwave Signal Generator. It further describes the differences between the several firmware versions.

CAUTION	**Potential malfunction of assembly!**
⚠️	It is strongly recommended to **do no firmware downgrade** below the version the device was originally delivered with. Improved module revisions and corresponding structure of calibration data may not be supported by older firmware versions.
	Due to structural modifications in the PCI FPGA, after upgrading instrument to 2.05.47.34 it can not be downgraded to 2.03.243.04 or earlier.

Rohde&Schwarz provides **two different** ways for updating firmware on the SMF:

- The first is based on an ISO-image file and provides a complete system-recovery of the SMF. Mass memory is new formatted, operating system and firmware are updated, user data is lost. **This procedure is required if the current firmware version of the instrument is less than 2.04.243.04.**

- The second is based on a Rohde&Schwarz firmware update file and provides a faster and smarter update. Less equipment is required and user data is preserved. This update procedure requires that the instrument is operational and its current firmware version is at least 2.04.243.04.

2 Firmware update using ISO image

CAUTION   **Potential loss of data!**

⚠   User Data will be lost during this procedure. Instrument serial number, software
                     options and all calibrations requiring external measuring equipment are not
                     affected.

2.1 Required equipment

Software:
- ISO image for firmware update SMF_2.05.47.34.iso

Hardware:
- **External** USB CD or DVD ROM burner with USB cable.
- 1CD Recordable.
- PC with burn program that can burn ISO images onto CD.

About ISO image
This is a standardized file format for creating CD images. A CD image is a single file encapsulating the whole data of a CD including directories and files. Unpacking the image to a CD restores the original data. Almost any CD burning program is able to write CDs based on ISO images.

2.2 Update procedure

Preserve Network Settings

For network operation the SMF provides several settings including hostname which are lost by this update procedure. If necessary, note these settings before applying the update:

- Switch on instrument

- Press the SETUP key, select **Network Settings…** and note the host name. If IP Address Mode is set to static, also note IP Address, Subnet Mask and Def. Gateway.

- Switch off instrument

Burn ISO image onto CD

Nero Burning ROM (StartSmart) is used in this example

- Connect the external USB CD/DVD drive to the PC
- Insert CD recordable
- Start Nero StartSmart
- Select medium „CD"
- Select „Create Data CD"
- From the **Files menu**, open file SMF_2.05.47.34.iso
- Click "Burn"
- When finished, close Nero and disconnect external USB CD/DVD drive

Install new firmware on SMF100A

- Instrument must be switched off
- Connect the external USB CD/DVD drive to the SMF
- Switch on Instrument
- The instrument boots from external drive
- Follow the instructions on screen
- Disconnect the external USB device
- Reboot instrument

Note: *If the CD does not boot ensure that you have burned the ISO-image as an "image" and not as a single file. Check the CD regarding presence of these files: BOOT.CAT, FULLIMG.GZ, ISOBOOT, ISOLINUX.BIN, ISOLINUX.CFG, ISOROOT.*

Check for PCI FPGA update

- During reboot the firmware automatically checks whether an update of the internal PCI-FPGA is required.

- If the PCI-FPGA is up to date, instrument firmware starts as usual. Wait until firmware is operational and continue with internal adjustments

- If an update is required, follow instructions and wait until firmware confirms success. The update may take several minutes.

CAUTION   **Risk of instrument malfunction!**

Do not interrupt the PCI FPGA update and do not switch off power during update until instrument confirms success.

- To apply the new FPGA configuration data a power off/on cycle is required. Press OK to shut down the instrument and wait until yellow stand by led lights up.

- Restart instrument using the power button and wait until instrument is operational.

Execute internal adjustments

CAUTION	**Risk of damage for device under test!**
⚠️	During adjustment, assemblies **without step attenuator** (SMF-B26 or SMF-B27) temporarily provide high power at the RF plug. This may cause damage to the device under test (DUT). Furthermore, those instruments require that the RF plug is terminated by 50 ohm during adjustment. So it is recommended to disconnect the DUT and replace it by a 50 ohm terminating resistor.

- Press the PRESET key on the instrument front panel.
- Press the SETUP key, select Internal Adjustments and execute **Adjust All**.
  This procedure updates all internal instrument adjustments and will take several minutes. Adjustments requiring external measurement equipment are not affected by the firmware update and need not to be performed.

Restore Network Settings

Restoring the hostname requires protection level 1 to be unlocked.

- Press the SETUP key, select **Protection** and then **Protection Level 1.**
  Enter Password "**123456**".

- Press the SETUP key, select **Network Settings…** and enter host name. The factory Host Name is of the form "rssmf100axxxxxx" where "xxxxxx" is replaced by the serial number.

- If IP Address Mode has been **Static** restore IP-Address, Subnet Mask and Def. Gateway.

3 Firmware update using R&S update package

This update procedure requires that the instrument is operational and the current firmware version is at least 2.04.243.04. There is no need to uninstall the current firmware. Instrument settings are preserved during the update, including user data and network settings.

Note: *To perform this procedure, USB Device must be enabled in security settings.*
             *Press the SETUP key, select **Security** and check **USB Device** setting.*

3.1 Required equipment

Software:
- RSU update file SMF_2.05.47.34.rsu

Hardware:
- USB Memory Stick with enough free space to store the update file (about 20-50 MByte).

The stick does not need to be bootable and previous data on the stick is not affected. Several update files may reside on the stick in parallel. During update procedure the stick is not modified by the instrument.

3.2 Update procedure

Prepare Memory Stick

- Download update file to a PC
- Connect USB stick to PC and copy the update file **into the root directory**.
- Remove USB stick.

Install new firmware on SMF100A

- Switch on instrument.
- Wait until instrument is operational.
- Connect USB stick to instrument.
- Wait a few seconds until message appears box appears. Confirm by pressing the rotary knob.
- Select firmware version using the arrow keys and press knob
- Wait until „update complete" message box appears. This may take several minutes.
- Remove USB stick and press knob. Instrument will reboot.

Check for PCI FPGA update

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- If an update is required, follow instructions and wait until firmware confirms success. The update may take several minutes.

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4   Modifications in Current Version

Due to customer demands, starting with Firmware Version 2.05.47.10 **the reference oscillator settings are moved out of the scope of PRESET and *RST.** This change has been made since the reference oscillator loop takes several seconds to synchronize and unintentional modification following *RST leads to long measurement times and disturbance of other instruments relying on the reference.

So the focus of *RST is to reset states regarding internal instrument operation while leaving settings which are associated to the measurement and remote control environment.

In addition to the reference oscillator the following settings are out of the scope of *RST:

- GPIB address
- Network settings
- Emulation settings
- Keyboard and Screen Saver settings
- Start / Stop GUI update
- Security settings

These settings can easily being reset to factory values by using the new function **Factory Preset**, located at the bottom of the SETUP Menu. **Factory Preset** includes PRESET.

The new firmware offers the following functional improvements:

4.1 Version 2.05.47.34

Bugfix version

4.2 Version 2.05.47.32

Reduced level leakage during POWER OFF	6626
New modulation type "Chirp"	6348
Significantly reduced phase jump on most frequency settings	6344
Support of FSYN variants 4 and 6	6308

4.3 Version 2.05.47.10

Support of option SMF-K28: NRP-Z Power Analysis	6302
Support of option SMF-K27: Pulse Train Generator	6300
New parameter "Blank Mode" in Menu Auxiliary I/O	6258
New function "Factory Preset" (Setup-Menu) resets settings not covered by PRESET Key	6223
PRESET (*RST) does not affect reference oscillator settings any more	6210
Automatic User correction with NRP-Z Sensor	6107
NRP-Z Power Viewer: Build-in support of NRP-Z series power sensors	6106
Current setting of step attenuator are displayed in block diagram	6033
Support of up to four USB mass memory devices (e.g. USB sticks) for user data	5440
Support of List Mode for fast frequency and level settings	5313

4.4 Version 2.04.303.03

User specific *IDN? response string in Remote Channel Settings	5869
Support of option SMF-B2 (Down Converter), Frequency Range 100kHz – 1GHz	5854
Support of Marker Sweep	5819
Improved emulation of HP8340 microwave generators	5122

4.5 Version 2.04.277.02

Support of option SMF-K4 (Ramp-Sweep) including X-output and markers	5307
Support of options SMF-B144 and SMF-B27 (43.5GHz)	5306
Support of STOP connector (interrupts running sweeps incl. Ramp-Sweep)	5837
Additional sweep-modes "Extern Single" and "Extern Step"	5622
Added sweep-marker	5316

4.6 Version 2.04.243.04

Support of option SMF-B84 (Removable USB Device Interface, Remote-Control via USBTMC)	5574
Improved settling times for frequency and level	
Improved DWELL time for sweeps	5573
Pulse generator: Several minimum values improved	5411
Support of option SMF-B81 (Rear Connectors)	5326
Added external level control by detector and power meter	5309
Emulation of HP8340 microwave generators	5122
Emulation of HP8360 an HP8370 microwave generators	5121
Firmware update using USB stick for upcoming firmware versions	

4.7 Version 2.04.154

Support of option SMF-B31 (High Power Output)	5305

4.8 Version 2.04.140

Initial SMF firmware version

Note: *The front panel keys* `HCOPY` *and* `STATUS` *are provided for future use and have no function yet.*

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5 Problems eliminated

The new firmware fixes the following issues:

5.1 Version 2.05.47.34

Possible level overshoot at 1GHz when crossing this frequency during ramp sweep	6977
Switching between external to internal reference may lead to RF frequency shift	6976
RF frequency does not match displayed value after switching off ramp sweep	6973

5.2 Version 2.05.47.32

Instruments without B20: Firmware crash when activating Power Viewer Permanent	6810
Ext ALC did not work below 1GHz	6773
Black screen when pressing digit key and unit key at the same time	6729
Ramp Sweep: No unit allowed when setting Sweep Time via remote control	6722
External level control: NRVS not applicable, removed from Power Meter Type selection	6721
Frequency Variation Step: Minimal value was 1MHz, corrected to 0Hz to enable small steps	6720
List Mode EXT STEP: First frequency step faulty in 2.05.47.25	6695
TTL-Mode did not work with R&S analyzers due to above error	6695
Ramp Sweep mode Single: Sweep starts with second step frequency	6610
Sometimes LAN not available after power on due to race condition	6604

5.3 Version 2.05.47.25

Check Front Panel: Dialog did not fit screen, STATUS key did not work	6560
Pulse Modulation: 0.3dB level overshoot in ALC ON mode	6517
Entering numeric values: Malfunction of unit selector when serving with arrow keys	6491
Unintended error message when leaving list mode	6448
Pulse Generator: Wrong preset value of Double Pulse Delay	6440
List Mode: Out of memory when learning lists longer than 2.000 elements	6419
EMF state did not work as expected	6417
Pulse Train: Some SCPI commands did not work as expected	6396
List Mode: Failed at 11GHz under certain circumstances	6392
Reference Oscillator settings has been reset after power on	6377
Pulse Generator: Width of SYNC signal is extended if suitable	6292
FM not active after power on or *RCL under certain circumstances	6197
Screen saver did not switch off backlight	5903

5.4 Version 2.05.47.10

Unintentional phase noise near maximum level on some instruments	6374
Unjustified message "Synthesis step frequency multiplier unlocked" during ramp sweep	6355
Ramp sweep exceeds stop frequency under certain circumstances	6345
Blank signal did not cover X-ramp during ramp sweep	6345
Double blank pulse during ramp sweep under certain circumstances	6345
Hostname entry field now accepts '-' character	6329
Unjustified error message following "IP" command of 834x emulation on some instruments	6326
Lower limit of RF level inappropriate for instruments without step attenuator	6320
SAV/RCL did not work since file selector didn't recognize setting file extension	6189
Screen saver did not work reliable	6179
Dialogs minimized to WinBar using a mouse could not be made visible again	5525
Toggle key did not work on RF ON/OFF	5430

5.5 Version 2.04.303.04

Attenuator setting issue on instruments with SMF-B31, SMF-B144 but **without** SMF-B2   6124

5.6 Version 2.04.303.03

Empty and persistent progress bar window in case of Scan AM with two LF Gens active   6057
Spikes on X-Output   6044
Several rare failures due to internal communication problems   6040
FSK did not work   5941
"Unhandled Interrupt" message on some instruments after power on   5898
Incorrect (too short) blank signal during frequency sweep   5890

5.7 Version 2.04.277.02

"Query interrupted" condition on USB remote interface stopped instrument   5572
Malfunction of REARRange key fixed   5520
"Phase Offset" setting did not work   5252

5.8 Version 2.04.243.04

Missing progress bar during internal adjustments and FPGA update   5575
High level on RF plug during calibration (fixed for instruments with step attenuator)   5520
Changing screen saver waiting time had no effect   5438
Security: Disabling LAN and USB had no effect   5437
Security: User password and VNC password could not be changed   5436
Preset value of puls mode source set to intern   5428
RF OFF setting has been ignored after power on   5425
Lower limit of level setting has been wrong on instruments without step attenuator   5418
Wrong setting of pulse input impedance   5414
Missing RF level after changing LF generator settings   5410
Several problems regarding pulse modulation   5409
Instruments without SMF-K83 (IEEE interface): Deadlock during power down sequence   5343
IP address lost after reboot   5284
Missing error message "Output unleveled"   5263
Missing "REMOTE"-state on VXI.11   5233
Malfunction on frequency setting 11.999…999GHz   5116
"Flickering display" after some hours of inactivity   5079
Problems with cursor position on frequency input   5041
Amplitude modulation depth had been limited to 50% in case of single modulation source   4856
Malfunction of LOCAL key in some situations   4821
SCPI Error Queue: Missing additional explanations   4703

5.9 Version 2.04.154

Rotary knob changed direction on level variation across attenuator steps	5045
Fast level variation with rotary knob influenced lower digits	5022
Deadlock on GPIB operation under some circumstances	4948
Menu items could be modified even in REMOTE state	4931

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