R&S®SMA100A
Signal Generator
Release Notes
Firmware Version 2.20.470.18

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The following abbreviations are used throughout this document:
R&S®SMA100A is abbreviated as R&S SMA100A.

Test and Measurement

Release Notes

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1 Information on the Current Version and History

General information

This document describes the procedure to apply a firmware update to the R&S®SMA100A Signal Generator. It furthermore describes the differences between the several firmware versions. The most current firmware version can be obtained from **www.rohde-schwarz.com**.

Instruments covered

This firmware version is suitable for all instruments of type **R&S®SMA100A,** including all module revisions, options and firmware licenses.

Identify current firmware version

The current instrument firmware revision is displayed during the startup sequence of the instrument. In addition, it is provided in the SETUP Software/Options dialog and it is part of the SCPI *IDN instrument identification string.

NOTICE

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 as well as modified structure of calibration data may not be supported by previous firmware versions.

1.1 Special hints for particular instruments and firmware versions

Instruments with firmware less than 2.15.185.13

To update these instruments to the current firmware version, the update procedure based on the ISO image file is required, as described in chapter 2.3.

Instruments with firmware less than 2.04.299.02

To update these instruments to the current firmware version, the update procedure based on the ISO image file is required, as described in chapter 2.3.

Instruments with firmware prior to 2.05.68.13

Due to customer demands, starting with Firmware Version 2.05.68.13 **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 lead to long measurement times and disturbance of other instruments relying on the reference.

In general 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.

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

- RF Level Limit
- Current level unit and EMF state
- Remote control settings including GPIB address and emulation mode
- Network settings
- Keyboard and Screen Saver settings
- Start / Stop GUI update
- Power On settings
- Security settings

With exception of the security settings these settings can easily be reset to factory values by means of the function **Factory Preset**, located at the bottom of the SETUP Menu. Factory Preset includes the scope of PRESET. Security settings (e.g. passwords and enable/disable states of USB and LAN) are not affected to maintain instrument security. For remote operation the command **SYST:FPReset** is provided. Be aware that executing this command likely terminates the remote connection.

Furthermore, beginning with Version 2.05.68.13 the behavior of the key WINBAR has changed. It now directly toggles between the open setting dialogs. It is not necessary to use the rotary knob.

1.2 Version 2.20.470.18

Released : August 2012

New Functionality

- NRP-Z Level Control: Level can be continuously controlled using NRP-Z power sensors.
- New Setting “Frequency Multiplier” enables the instrument to modify the displayed frequency value by a user definable factor.
- Support of IVI-6.1 High Speed LAN instrument protocol (HiSLIP)
- LAN Services can be enabled and disabled individually to prevent unintended access to instrument
- Frequency and Level displays can be annotated in **SETUP** Security in order to conceal the current frequency and level and showing only asterisks instead.
- New remote control emulation R&S® SMT03
- New remote control emulation R&S® SMY01 and R&S® SMY02

Modified Functionality

- VOR Modulation (R&S® SMA-K25): Added ICAO channels, if **Carrier Freq. Knob Step** is set to **Defined**.
- ILS-Loc/ILS-Gs Modulation (R&S® SMA-K25): The parameters are sorted in a different order for improved usability.
- DME Modulation (R&S® SMA-K26): The parameters are sorted in a different order for improved usability.
- DME Modulation (R&S® SMA-K26): Channel Suffix enhanced with ICAO channels.
- Phase settings: The resolution for delta phase changed to 0.01 deg
- Improved stability and performance of USBTMC
- Directory /var/user, that is intended for user data storage, is no longer used by any instrument files. Former instrument directories like “Lists” may be removed if appropriate.
- Support of wildcards ‘*’ and ‘?’ in mass memory system MMEM
- Remote control emulation Aeroflex 202x: Added suffix 2 as an alias for suffix 1 in AM, FM and PM subsystem
- Remote control emulation Aeroflex 203x/204x: Added subsystem SWEEP

- Remote control emulation Agilent E44xx/N51xx: Added file selection for the variants “file@msus”, “msus:file” and “absolute path to file” to the MMEM/MEM subsystem. Valid data for msus are “UFLT” and “LIST”.
- Remote control emulation Agilent E44xx/N51xx: Added subsystem LIST and SWEEP

Fixed Issues

- VOR Modulation (R&S® SMA-K25): Missing SCPI command :SOURce:VOR:FREQuency:STEP to set the **Carrier Freq Knob Step** to **Defined**.
- All Sweeps: In mode Single with shape Triangle, the R&S® SMA100A ignores Execute Single commands while the sweep is running
- All Sweeps: In mode Extern Single with shape Triangle, the R&S® SMA100A jumps back to the beginning and stops (like reset) on external trigger signals applied during the triangle return slope.
- Listmode: In mode Single, the R&S® SMA100A ignores Execute Single commands while the listmode is running
- viClear() over USBTMC blocks further communication
- Communication break, after applying viClear() to USBTMC interface
- *CLS did not clear error queue
- Some message boxes did not accept ENTER/x1
- NRP-Z Power Viewer indicator could not be configured to display peak values
- Socket connection might lose data packages send in a fast sequence
- Several issues around the data/time dialog
- IEEE488 GTL message potentially outruns last command header causing the instrument to re-enter the remote state (looks like GTL does not work)

1.3 Version 2.15.185.25

Released : September 2011

New Functionality

- New parameter RF OFF Mode in dialog “Level”, section “Attenuator Settings”. The two modes “Full Attenuated” and “Unchanged” are available. The mode “Full Attenuated” is the default and the R&S SMA100A has the same RF OFF behavior as before. With the mode “Unchanged” it is possible to prevent switching of the attenuator relais. The SCPI command is POWer:ATTenuation:RFOFf:MODE UNCHanged | FATTenuated.

Fixed Issues

- Option R&S® SMA-K26 (DME): Changing the pulse repetition rate has no effect, when DME mode is reply and squitter is on.

1.4 Version 2.15.185.22

Released : March 2011

New Functionality

- Remote control emulation Aeroflex 2040: For ILS-LOC modulation the COM-ID code is programmable via sequence generator

Fixed Issues

- Adjust DME Pulse Slope: In rare cases, the DME Pulse Slope adjustment failed due to corrupt calibration files
- External Level Adjustment: In rare cases, the external level adjustement failed due to low level

1.5 Version 2.15.185.17

Released : December 2010

Fixed Issues

- External Level Adjustment: Customer data will not be used after power on
- No valid DME pulse will be generated, if DME NRP trigger normalization failed due to missing connection between RF output and R&S® NRP-Z81
- Wrong FM deviation, if the DME modulation was active before
- DME modulation: Mode “Reply”, Trigger Mode “Ext. Power Sensor”: Trigger does not work after changing the frequency
- DME Modulation: After execution of “Normalize Setup” in DME Analysis the system will hang for several minutes.

1.6 Version 2.15.185.15

Released : October 2010

Fixed Issues

- Adjustment after firmware update is not working due to restrictions in the file system. This effect could only show up when updating older instruments with rsu-files. Newer instuments (shipped from mid 2009) are not affected.
- Entering new license keys may lead to misleading error messages.
- Remote commands *IDN? and *OPT? are not working correctly when code emulation is active, i.e. SCPI language is not native ("SCPI").

1.7 Version 2.15.185.13

Released : October 2010

New Functionality

- Support of new wide screen display (this version is necessary for all SMA with serial number higher than 103000)
- Remote control emulation Agilent E4428 and E4438 (ESG)
- Remote control emulation Agilent E8257 and E8267 (PSG)
- Remote control emulation Agilent E8663
- Remote control emulation Agilent N5161, N5162, N5181, N5182, N5183 (MXG)
- Remote control emulation Racal 9087
- Remote control emulation Aeroflex 2051/2052
- Option R&S® SMA-K28 (Power Analysis): New trigger modes “Internal” and “External”
- Option R&S® SMA-K28 (Power Analysis): User specific level offset
- Option R&S® SMA-K28 (Power Analysis): Added mathematical functions and reference trace
- Annotation of Frequency and Level displays can be disabled and enabled in SETUP Security
- Display can be deactivated to hide instrument settings. Configuration in SETUP Security or by SYSTem:DLOCk ON|OFF.
- Keyboard can be deactivated to prevent unauthorized modification of instrument settings. Configuration in SETUP Security or by SYSTem:KLOCk ON|OFF

Modified Functionality

- RF leakage improved if RF OFF

- NRP-Z Power Viewer will be switch on by default if a power sensor is plugged in
- Support of up to four power sensors in Power Viewer and Power Analysis. New SETUP NRP-Z Info dialog provides properties of all power sensors connected. In addition, sensor firmware can be updated via instrument.
- Level unit is preserved during power off
- All sweeps: Maximum dwell time increased to 100s
- Revised and simplified configuration of emulation settings in Remote Channel Settings dialog.
- External USB keyboards: Support of international keyboard layouts
- Revised and simplified network settings dialog including connection state indicator. Option “Peer to Peer” removed since this feature is covered by the “Auto(DHCP)” mode now.
- Improved Security concept (menu SETUP Security Settings)
- Improved file selector and file manager
- To avoid unintentional instrument settings, values entered by keyboard or front panel will be discarded when input is aborted without confirmation by ENTER or unit key
- OCXO Adjustment: Calibration value is not affected by PRESET or *RST
- Remote control emulation HP 8643: FMpreemphasis and LFSource:xyz2 implemented
- Improved firmware update process in case of less free flash memory

Fixed Issues

- Option R&S® SMA-K27 (Pulse Train): Repetition count does not work for last table entry in trigger mode “Ext Triggered”
- SCPI command SENS:POW:SOUR returns RF instead of “A”
- SCPI command CORR:CSET:DATA:SEND:POW:SONC does not work
- AM Modulation: For frequencies <= 30 MHz the error message “Level Overrange” appears
- The SCPI commands FREQ:CENT? MAX/MIN and FREQ:SPAN? MAX/MIN returns always the maximum/minimum RF frequency
- Level user step does not work correct as expected
- Remote control emulation Rohde & Schwarz SMGU: Ignore white spaces
- Remote control emulation HP 8662: Errors while mixing different modulations
- Remote control emulation HP 8662: Command FR causes an error “Value out of range”
- Network settings (e.g. IP-Address) were lost when configured while no network is attached

- Missing error message when attempting to disable USB mass storage usage while storage is attached
- Sporadic lockups in raw ethernet channel
- Several issues regarding SCPI MMEM subsystem
- If the screensaver is disabled by SCPI the display is not switched on

1.8 Version 2.10.001.31

Released : October 2009

New Functionality

- Composite AM (15 Hz/135 Hz) included in DME modulation (Option R&S® SMA-K26)

Fixed Issues

- ILS Modulation: Wrong LF Output Level
- In rare cases, an error message “Settings Conflict” occurs after PRESET

1.9 Version 2.10.001.26

Released : June 2009

New Functionality

- Remote control emulation Rohde & Schwarz SMGU/SMHU

Modified Functionality

- All avionics modulation (Options R&S® SMA-K25: VOR/ILS and R&S® SMA-K26: DME): COM/ID code supports numerics

Fixed Issues

- DME Modulation: ID Rate not correct

1.10 Version 2.10.001.22

Released : June 2009

New Functionality

- Pulse Train (Option R&S® SMA-K27)

- Remote control emulation Aeroflex 2023/2024
- Remote control emulation Aeroflex 2050
- Remote control emulation HP 8643/8644
- Remote control via RS232 by means of a standard external USB to RS232 adapter

Modified Functionality

- Improved NRP-Z Power Analysis (Option R&S® SMA-K28) including Pulse Data Analysis capabilities and gate mode
- All avionics modulation (Options R&S® SMA-K25: VOR/ILS and R&S® SMA-K26: DME): COM/ID code supports up to 4 characters
- VOR modulation (Option R&S®SMA-K25): Subcarrier frequency resolution changed from 10 Hz to 0.1 Hz
- ILS-GS and ILS-LOC modulation (Option R&S® SMA-K25): DDM can be entered in %
- DME modulation (Option R&S® SMA-K26): Variable squitter rate
- Improved frequency offset setting
- Instrument can be switched off by remote command: SYSTem:SHUTdown
- Instrument firmware can be restarted by remote command: SYSTem:RESTart
- New dialog SETUP / NRP-Z Info provides information of attached power sensors and the feasibility to update the firmware of attached power sensors
- Improved file selector and file manager
- USB Resource String: Product ID displayed as HEX-value

Fixed Issues

- Remote control: Sporadic locks in raw Ethernet channel
- Storing files using MMEM instructions failed if file already exists (affects SAV/RCL)
- Values of 0.0 sometimes displayed with too much digits and improper unit

1.11 Version 2.05.220.13

Released : December 2008

Fixed Issues

- File manger shows invalid directories
- Bugfix for selftest

1.12 Version 2.05.220.10

Released : November 2008

Modified Functionality

- Remote control emulation: The selected remote control emulation will be displayed in the info line

Fixed Issues

- The button “Adjust DME Pulse Slope” in the dialog “Internal Adjustemnts” does not have any function until the DME dialog would be opened for the first time
- During the DME analysis the error message “Err-222 Value out of range” appears
- SMA-B103L and SMA-B106L does not support DME
- The tooltip does not display the correct values and units
- Changes at the level units does not work
- The BUSY indicator does not appear during the whole preset time
- Some read only parameters are not marked as read only parameters
- Downgrade to a firmware version 2.05.68.18 or lower does not work

1.13 Version 2.05.220.02

Released : October 2008

New Functionality

- New feature DME Modulation (Option R&S® SMA-K26)
- New feature Power Analysis (Option R&S® SMA-K28)
- New feature remote control emulation HP 8642
- New feature remote control emulation HP 8645
- New feature remote control emulation HP 8647/8648
- New feature remote control emulation HP 8664/8665

Modified Functionality

- ILS-GS and ILS-LOC: New parameter DDM Polarity. In the default state this value is 90 Hz – 150 Hz
- All avionics modulation (Options R&S® SMA-K25 and R&S® SMA-K26): Enhanced COM/ID settings, with the possibility to set individual dot, dash, symbol space and letter space length.

- NRP-Z Power Viewer: Support of up to three R&S NRP-Zxx power sensors. The different R&S NRP-Zxx power sensors can be selected via a combobox at the top of the dialog NRP-Z Power Viewer.
- The summary screen (large frequency and level display) can be activated and deactivated in the menu Setup → Display Settings. In the default state the summary screen is deactivated. This setting is not affected by pressing the PRESET button or sending ***RST**.
- The RF output can be deactivated, if the reference oscillator source is set to external and no reference signal is connected. In this case the RF output can be deactivate in the menu RF → Ref Oscillator. In the default state the RF output is not deactivated. This setting is not affected by pressing the PRESET button or sending ***RST**.

Fixed Issues

- LF Output: The LF generator frequency differs for more than 5 mHz
- Dialog of the online help window too large
- Adjustment: If the internal adjustments are executed with external reference, and no external reference is connected, no error message occurs. Phase continuous frequency settings: In rare cases the frequency synthesis could be work in an undefined state. Only with R&S SMA-B20
- ILS-GS and ILS-LOC: Improvements for DMM input in µA
- Remote control emulation: No remote sign in emulation mode
- Remote control emulation Aeroflex 203x/4x: The command MODE does not work

1.14 Version 2.05.68.18

Released : July 2008

Fixed Issues

- External Pulse Modulation: Unwanted double pulse at rising pulse edge

1.15 Version 2.05.68.17

Released : May 2008

Fixed Issues

- Modulation ILS-GS/ILS-LOC: Entering DDM values less then -0.8 (ILS-GS) or less then -0.4 (ILS-LOC) crashes the software, if DMM is coupled to SDM

1.16 Version 2.05.68.13

Released : April 2008

New Functionality

- Support of NRP-Zxx power sensors (power viewer and user correction)
- Chirp modulation, this feature is available only for interface boards with part number 1400.0530.02
- Phase Continuous Frequency Settings
- Remote control emulation for HP 8643/8644

Modified Functionality

- Support of new standard synthesis (SSYN) with part number 1141.4220.02
- Support of new synthesis extension (SMA-B20, SYNEX) with part number 1142.0270.02
- Support of new clock synthesis (SMA-B29, ClkSyn) with part number 1400.2749.02
- DC offset for clock synthesis (SMA-B29), this feature is available only for clock synthesis with part number 1400.2749.02
- LF generator: LF generator frequency resolution changed from 0.1 Hz down to 0.01 Hz
- RF Frequency Sweep: Support of new shape ‘triangle’
- RF Level Sweep: Support of new shape ‘triangle’
- LF Frequency Sweep: Support of new shape ‘triangle’
- The behaviour of the WINBAR key has been modified. The WINBAR key toggles through all open windows
- The behaviour of the DIAGRAM key has been modified. The DIAGRAM key toggles between diagram, the summary screen and the last open dialog
- Dialog File Manger: Handling improved
- Support of up to four USB mass memory devices (e.g. USB memory sticks) for user data
- New function “Factory Preset” (Setup-Menu) resets settings not covered by PRESET Key
- PRESET (*RST) does not affect reference oscillator settings any more

Fixed Issues

- Remote Control: The command SOURce:POWer UP does not work
- Modulation ILS-GS/ILS-LOC: The DDM could not be entered in µA

- Remote Control Emulation: A user defined selection of *IDN? does not have any effect
- Remote Control Emulation: *IDN? selection does not saved while firmware shutdown
- Remote Control Emulation Aeroflex203x/4x: CFRQ? Does not return the current frequency
- Remote Control: Time parameters do not work in exponential description
- Listmode: Listmode does not work for f > 3GHz, if SMA-B106 and SMA-B20 installed
- Modulation ILS-GS/ILS-LOC: No coupling between GS and LOC
- Modulation ILS-LOC: Setting of modulation frequency does not have any effect
- Menu→Setup→Ethernet does not open the remote settings for Ethernet
- Online Help: Missing help pages for few pulse generator and listmode parameters
- Save/Recall: Could not recall saved setups

1.17 Version 2.05.04

Released : November 2007

New Functionality

- New feature remote control emulation for Aeroflex 2030/2031/2032/2040/2041/2042
- New feature remote control emulation for Racal 3102

Modified Functionality

- Support of new interface board (IfBoard) with part number 1400.0530.02
- Sweep: Minimum dwell time change from 10 ms down to 3 ms
- Pulse generator: New limits for pulse period (20 ns to 100 s), pulse width (5 ns to 100 s), pulse Delay (10 ns to 100 s), double pulse width (5 ns to 100 s), double pulse delay (10 ns to 100 s) and resolution (5 ns)
- Modulation ILS: Resolution of ILS DDM changed from 1 µA to 0.1 µA (higher resolution)

Fixed Issues

- The last selected remote control emulation, is not activated after startup
- Keyboard repetition rate to high
- Dialog ‘Info Manager’: Only the button ‘History’ appears in the dialog
- Adjustment: Error messages during ‘Internal Adjustment’

- Listmode: Lost focus while editing a listmode list
- REARR-Button moves the Winbar
- Dialog ‘File Manger’: After ‘Create New Directory’ the instrument doesn’t operate
- Changing the GPIB address has no effect
- Frequency resolution sometimes 0.02 Hz
- Window size is sometimes zero
- SCPI: wrong error message after *rst
- RF Freq Sweep: No variation at the lowest digit possible
- The firmware crashes after preset
- Dialog ‘Clock Synthesis’: Window size changed if the ‘Variation Step’ is changed
- Front panel check: truncated descriptions
- Status bar changes its size when switching RF ON/OFF
- Dialog ‘LF Freq Sweep’: Variation of ‘Start Freq’ wrong

1.18 Version 2.04.299.02

Released : August 2007

New Functionality

- New feature USB remote Control
- New feature RAW TCP/IP remote Control
- New feature remote control within a web browser

Modified Functionality

- Support of new clock synthesis with offset
- Enhancements for SMA-K25

Fixed Issues

- Dialog ‘Reference Oscillator’: Input field for Adjustment DAC value too small
- Dialog ‘Frequency’: Rotary knob click on frequency crashes the firmware
- Dialog ‘Update’ doesn’t appears under setup menu
- Problems editing list mode table
- The screen saver wait time doesn’t have any effect
- Dialog Security: Disable USB dvice and disable LAN connections doesn’t work
- Dialog Security: User password and VNC password couldn’t be changed

- Setting times RF Off → RF On are longer than RF On → RF Off
- While rebooting the instrument, the IP address is lost
- List mode: While learning no progress bar appears
- Level error for FM and Pulse modulation by f < 6.6 MHz
- Winbar shows only one modulation
- Polarity could be changed for pulse generator gate
- Preset crashes the firmware
- LOCAL key doesn't work

1.19 Version 2.02.149

Released : December 2006

New Functionality

- Operating altitude up to 4600m (Options R&S SMA-B46)

Fixed Issues

- Modulation ILS: display DDM definition
- Modulation ILS-GS, ADF: COM ID removed for ILS-GS and added to ADF
- HP Emulation: Display info message if RF is off in emulation mode
- HP Emulation: The remote command ms crashes the firmware
- HP Emulation: Corrections of command as

1.20 Version 2.02.136

Released : October 2006

Fixed Issues

- An error message "Unhandled Interrupt …" occurred while executing adjustment
- Frequency steps from 2999.9 MHz to 3000.1 MHz with SMA-B20 are wrong
- Phase settings between 180 MHz <= f <= 750 MHz wrong
- Some remote settings won't be stored during shutdown of the system
- The info manager hasn't any delete buttons

1.21 Version 2.02.102.01

Released : July 2006

Fixed Issues

- Pulse modulation doesn't work in rare cases
- Missing SCPI command FM:INT:FREQ
- Firmware crashes if incompatible modulations are switch on
- Online Help: SCPI command for FM/PM EXT impedance is wrong

1.22 Version 2.02.91

Released : July 2006

New Functionality

- Support of frequencies up to 6 GHz (Options R&S SMA-B106 / R&S SMA-B106L)
- New feature VOR (Option R&S SMA-K25)
- New feature ILS-GS and ILS-LOC (Option R&S SMA-K25)
- New feature MKR-BCN (Option R&S SMA-K25)
- New feature ADF (Option R&S SMA-K25)

Fixed Issues

- Wrong setting of GPIB address after power off
- Pulse modulator and pulse generator: switching of input impedance wrong
- An update overwrites the hostname
- FM deviation: missing SCPI commands
- FM/PhiM: switching of input impedance incorrect
- CF-Cards could not be changed between different instruments

1.23 Version 2.02.76

Released : June 2006

New Functionality

- New sweep mode external start/stop

Fixed Issues

- Entering IP Address crashes the software
- Host name might be changed only with protection level 1
- List mode frequency higher than 3 GHz doesn't work
- 2 tone AM deviation incorrect
- List mode doesn't stop by Preset
- List mode doesn't support more than 30 elements
- Firmware hangs while writing time monitoring data
- MMEM have problems with spaces
- Firmware restarts while open dialog level
- Some help pages are wider than the display
- Button "Adjust FM Offset" has to be remove in extern digital selection
- Pulse generator trigger input: wrong settings

1.24 Version 2.01.11

Released : January 2006

Modified Functionality

- Display the option R&S SMA-B81 (if installed) in the setup → software options dialog
- Date and time can be set
- Info manager shows messages only once
- Improvement for fast hop bus

Fixed Issues

- Problems with the merging of the ENTER and x1 key
- Input of Noise Bandwith (dialog LF Output) not possible with unit keys
- Level Sweep Dialog: The width of start freq and stop freq editbox increase
- In the RF menu it isn't possible to scroll to the top
- Pulse generator: Slope of the external trigger input couldn't be changed
- No automatically detection of network connection

1.25 Version 2.00.43.01

Released : January 2006

New Functionality

- Initial SMA firmware version

2 Firmware Update

2.1 Update Information

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

Rohde&Schwarz provides **two different** methods for applying a firmware update to the SMA100A.

The first is based on a Rohde&Schwarz firmware update file and provides a smart and fast update. There is no need to uninstall the current firmware. Instrument settings are preserved during the update, including user data and network settings. This update procedure requires that the instrument is operational and its **current firmware version is at least 2.04.299.02.**

The second is based on an ISO-image file and provides a complete system-recovery of the SMA100A. Mass memory is new formatted, operating system and firmware will be reinstalled, user data is lost. **This procedure is required if the current firmware version is less than 2.04.299.02**. It furthermore is required if instruments mass memory storage is not initialized (e.g. due to a replacement) or if the device is not operational for other reason.

2.2 Firmware update using R&S firmware update file

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

Required equipment

Software: Firmware update file **SMA_2.20.470.18.rsu**

Hardware: USB memory stick with enough free space to save the update file (about 30 - 50 MByte).

The memory 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.

Prepare Memory Stick

- Download update file to a PC.
- Connect USB stick to PC and copy the update file **into the root directory**.
- Wait until copy procedure has finished and remove USB stick.

Install new firmware on R&S®SMA100A:

- Switch on instrument.
- Wait until instrument is operational.
- Connect USB stick to instrument.
- Wait a few seconds until message box appears. Confirm by pressing the rotary knob.
- Select firmware version using the arrow keys and press knob to start update.
- Wait until ”Software update successful“ message box appears. This may take several minutes.
- Press any front panel key to shut down instrument and remove USB stick.
- Restart instrument by pressing the power button.

Depending on the current firmware version, this update procedure alternatively can be initiated by applying the USB memory stick while the instrument is powered off. In this case the update procedure is triggered right after powering on the instrument.

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.

NOTICE

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

NOTICE

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.

2.3 Firmware update using ISO image

NOTICE

Potential loss of data!

User Data and user specific instrument settings will be lost during this procedure. Instrument serial number, software license keys and all adjustments requiring external measuring equipment are not affected.

Required equipment

Software:

- ISO image for firmware update SMA_2.20.470.18.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.

Update procedure

Burn ISO image onto CD

On most computers, burning an ISO image can be initiated by simply double clicking the ISO image file. If this is not the case, the manual procedure is similar to the following instructions. 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_**Error! Unknown document property name.**.iso
- Click "Burn"
- When finished, close Nero and disconnect external USB CD/DVD drive

Install new firmware on R&S®SMA100A:

- 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

If the CD refuses to boot please ensure that you have burned the ISO-image as an “image” and not as a single file. Check the CD regarding presence of several files like 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.

NOTICE

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

NOTICE

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.

3 Open Source Acknowledgement

This instrument firmware makes use of valuable open source software packages. The most important of them are listed together with their corresponding open source license information in a separate Open Source Acknowledgement document. This document also contains the verbatim license texts and can be downloaded from www.rohde-schwarz.com.

The OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/). includes cryptographic software written by Eric Young (eay@cryptsoft.com) and software written by Tim Hudson (tjh@cryptsoft.com).
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Rohde & Schwarz would like to thank the open source community for their valuable contribution to embedded computing.

4 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.

Customer Support Europe, Africa, Middle East

Tel. +49 89 4129 12345

customersupport@rohde-schwarz.com

Customer Support North America

Tel. 1-888-TEST-RSA (1-888-837-8772)

customer.support@rsa.rohde-schwarz.com

Customer Support Latin America

Tel. +1-410-910-7988

customersupport.la@rohde-schwarz.com

Customer Support Asia/Pacific

Tel. +65 65 13 04 88

customersupport.asia@rohde-schwarz.com