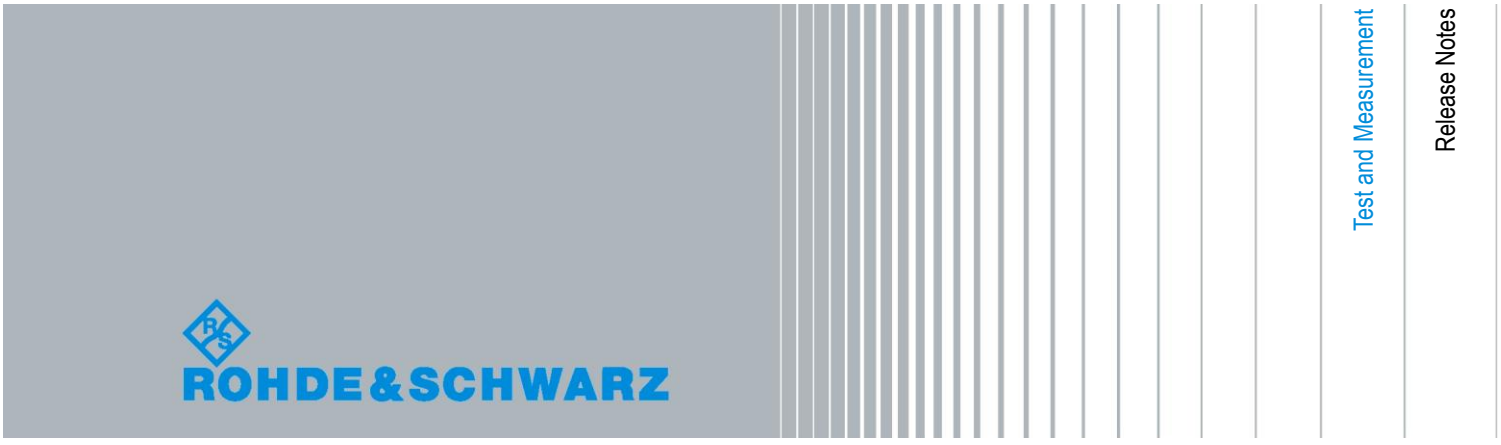
R&S®SMB100A
Signal Generator
Release Notes
Firmware Version 2.20.382.70

The following abbreviations are used throughout this document:
R&S®SMB100A is abbreviated as R&S SMB100A.



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1 Information on the Current Version and History

General information

This document describes the procedure of applying a firmware update to the R&S®SMB100A 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 2.20.382.70 is suitable for all instruments of type **R&S®SMB100A** including all frequency ranges and options.

Identify current firmware version

The current instrument firmware revision is indicated 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 improved structure of calibration data may not be supported by previous firmware versions.

Special hint for instruments equipped with firmware prior to 2.15.245.xx
Please first upgrade to 2.15.245.19 before upgrading the device to 2.20.382.70.

Afterwards, do not downgrade instruments to firmware versions prior to 2.15.245.19.

The functional improvements of the different firmware versions are registered below. New features are described in detail the build-in help system and in the latest version of the operating manual which can be obtained from **www.rohde-schwarz.com.**

The R&S®SMB100A provides a continuously growing number of device emulations. The current emulation set is described in chapter 2.

1.1 Version 2.20.382.70

Released: June 2012

New Functionality

Topic	Ref-No.
Support of Low Harmonic Filter on instruments up to 20GHz (SMB-B25) and up to 40GHz (SMB-B26)	10045
SMB-B5 (Stereo Coder): EON Burst-Length can be modified using direct mode instruction “EON-TA-BURST=x” or “EON-TA-BURST=x,y” with x and y between 4 and 8	10304
New waveform “Sawtooth” for LF Generator (requires RF-Board revision 1406.7207 and higher)	10259
New emulation for R&S SMR microwave instruments	9927

Modified Functionality

Improved display update repetition rate	10249
Improved stability and performance of USB-TMC	10178
Improved sweep dwell time of up to 5ms	10163
NRP-Z Power Viewer: User Frequency Sensor can be set to 0Hz (DC)	10098
SMB-B5 (Stereo Coder): Instruction “TRANS=” now carries up to 24 groups	10059
SMB-B5 (Stereo Coder): RDS alternative frequencies do not require position after decimal point any more	10057

Fixed issues

SMB-B5 (Stereo Coder): Reading back RDS texts containing carriage return characters fails	10303
Sometimes message “Device Key not found” appeared when an NRP-Z Power sensor has been connected during power on	10265
Pulse Train: No Sync Pulse when train contains null pulse	10258
Firmware terminates on instruments without pulse generator (SMB-K23) when pulse modulator dialog is opened	10205
On instruments without step attenuator, a message box displayed during internal adjustment does not behave as expected	10161

Known issues

Phase Modulation: By user interface, deviation can only be entered in rad, not in degree.	10119

1.2 Version 2.20.382.35

Released: March 2012

New Functionality

Topic	Ref-No.
New attenuator setting "RF OFF Mode" controls behavior of attenuator when RF is switched off and on	9749
Logarithmic AM for microwave instruments (SMB-B112 and up)	9908
LAN Services can be enabled and disabled individually to prevent unintended access to instrument	9987
Support of IVI-6.1 High Speed LAN instrument protocol (HiSLIP)	9937
SIGNAL VALID can be configured to act as sync signal for pulse generator (SMB-K23)	9880
NRP-Z Level Control: Level can be continuously regulated using NRP-Z power sensors	9557
Frequency indicator can be modified by a multiplication factor (in addition to frequency offset)	9536

Modified Functionality

SMB-B5 (Stereo Coder): Direct Commands are scanned in order to keep user interface up to date.	10134
Improved *RST Performance for instruments with SMB-B1(H) (OCXO) and SMB-B5 (Stereo Coder)	9979
Rotary knob combines subsequent actions, significant improvement of variation speed	9666
N5181 emulation: Added instructions for pulse generator	9543

Fixed issues

Phase Modulation: Deviation could not be entered by means of the unit keys	10119
Pulse Train: ON and OFF times wrong by 10ns under some circumstances	10018
Phase setting: Delta Phase to high at frequencies greater than 6.375GHz	10017
Unintended warning "Pep value greater than defined limit" at frequencies less than 23.4375 MHz	10010
HCOP:DATA? did not work in 2.20.237.xx	10003
Pulse Train: Long trains (several hundred elements) might fail	10002
Pulse Train: Times longer than 655us might fail	10000
X-Voltage not working on microwave instruments (SMB-B112 and up)	9990
On instruments without attenuator the warning dialog regarding internal adjustments did not behave as expected	9983
Improved system stability	9974
ESG Emulation delivers wrong value for SWE:POIN? MAX	9934
viClear() over USBTMC blocks further communication	9919
Communication break after applying viClear() to USBTMC interface	9918
SMB-B5 (Stereo Coder): PS did not accept special characters (like \061)	9894

CW signal for 3ms when setting RF level during level with pulse modulation active	9864
PULM:STAT[?] did not work in SML emulation	9854
Permanent options have been displayed with expiration date December 2002	9850
Under some circumstances error message “wrong datatype” after selftest	9781
Indicators in summary screen have not been updated properly	9745
Level too low by 6dB at exactly 23.4375 MHz with AM on	9722
*CLS did not clear error queue	9678
Some message boxes did not accept ENTER/x1	9663
ESR bit 6 has not been set at GTL	9594
Casually, after long periods of power down, some front panel keys did not work	9563
SMB-B5 Stereo Coder: Communication issues when switching RF between AM and FM frequency ranges	9369
Pulse modulation: External input could not be inverted on instruments without pulse generator	9253
Power Viewer indicator could not be configured to display peak values	9226
Socket connection might lose data packages send in a fast sequence	9168
Several issues around the data/time dialog	8746
IEEE488 GTL message potentially overtakes last command header causing the instrument to re-enter the remote state (looks like GTL does not work)	8684
SMB-B5 Stereo Coder: After power on or *RCL some settings are not re-established in a proper way	7939
Some unit keys did not work properly when EMF is active	7705

Known issues

Phase Modulation: By user interface, deviation can only be entered in rad, not in degree.	10119

1.3 Version 2.20.237.31

Released: August 2011 for SMB-B112(L), SMB-B120(L) and SMB-B140(L)

New Functionality

Support of instruments up to 40 GHz (SMB-B140)	

Fixed issues

Several issues regarding Pulse Train have been fixed	9705

1.4 Version 2.20.237.18

Released: June 2011 for SMB-B112(L) and SMB-B120(L)

New Functionality

Support of instruments up to 20 GHz (SMB-B120)	
New setting “Frequency Multiplier” enables the instrument to modify the displayed frequency value by a user definable factor.	9536
New Setting “RF during power search” modifies instruments behavior when operating with ALC Sample&Hold	9408

Modified Functionality

NRP-Z Power Viewer is switched OFF by *RST to maintain settling time in system applications	9379
Directory /var/user, which is intended for user data storage, is not longer used by some instrument files. Former instrument directories like "Lists" may be removed if appropriate.	7189

Fixed issues

Some errors have not been reported in SCPI error queue	9370
Pulse modulation: External input could not be inverted on instruments without pulse generator.	9253
Instruments settings have not been restored after internal adjustments	9240
An expiration date has been stated for permanent options	9230
Some slow USB memory sticks might not have been detected	9207
Ethernet socket connection may loose packages	9168
Several minor issues regarding importing and exporting lists	9051
With EMF State active, the current level unit was not preserved when instrument is powered off.	8476
Attenuator Fix setting has been during power down	8151
The EMF state was not reset by Factory Preset	8141

1.5 Version 2.15.245.19

Released: December 2010

New Functionality

Support of instruments up to 12,75 GHz (SMB-B112)	
Impedance of LF-Output can be set to LOW or 600Ohm. This feature is available for instruments with serial number 102400 or higher.	9036
Support of option SMB-K27 “Pulse Train”. This feature is available for instruments with serial number 102400 or higher.	8726
Emulation of Agilent ESG 4421 and 4422	8736
Frequency and Level displays can be annotated in **SETUP** Security	8201
Support of NRP-Z Peak Power Sensors	7313
New attenuator modes “Low Noise” and “Low Distortion”	7075

Modified Functionality

Exporting and importing lists does not require absolute pathnames any more	9037
*RST does not close setting dialogs any more	8749
NRP-Z Power Viewer is enabled automatically	8649
*RST performance improved when powers sensors are connected	8646
Sweep Dwell Time can be set up to 100 seconds	8635
Several significant improvements of LIST MODE, faster learning and support of long lists (20.000)	8400
Support of wildcards '*' and '?' in mass memory system MMEM	8371

Fixed issues

Calibration value of OCXO not displayed properly	8983
User step variation of level: Step size issue when level unit other than dBm	8697
Disabling screensaver via remote control fails to reactivate screen	8640
Firmware restart under rare circumstances, forcing IEEE address to factory value	8510
Key '0', '.' and ''-' not working properly when used in text mode	8343
CORR:CSET:DATA:SENS:POW:SONC does not work	8323
Telnet connection did not reconnect after interruption	8284
Ethernet Raw connection did not reconnect after interruption	8228
Attenuator Fix setting lost during power down	8151
SYST:PRESET did not work	7436

1.6 Version 2.10.116.18

Released: January 2010

New Functionality

LF Output can be configured to provide an X-Voltage for RF sweep. See RF sweep configuration menu. This function requires an RF board of part number 1406.7207 or higher.	8133
Keyboard can be deactivated to prevent unauthorized modification of instrument settings. Configuration in **SETUP** Security or by SYSTem:KLOCk ON|OFF	7882
Display can be deactivated to hide instrument settings. Configuration in **SETUP** Security or by SYSTem:DLOCk ON|OFF.	7882
Instrument now can be accessed via Microsoft Windows network	7441
Instrument now can be remote controlled via RS232 by means of a standard external USB to RS232 adaptor. Settings are located in **SETUP** Remote Channel Settings.	7387
Remote emulation: Support of arbitrary *IDN and *OPT strings.	7334
More than 20 additional remote emulations of Agilent and IFR (Aeroflex) signal generators.	7301

Modified Functionality

HP8643 Emulation: Added FM-Preemphasis and LF-Source	8073
SML Emulation: FM Mode is set to High Deviation	8067
Level Unit is saved and restored at power on	7957
Revised and simplified configuration of emulation settings in Remote Channel Settings dialog	7894
Level Limit setting not affected by **PRESET** to protect devices under test	7801
Revised and simplified network settings dialog including connection state indicator	7781
Improved RF level linearity at frequencies below 250kHz	7775
SMB-B5: Improved modulation reserve when preemphasis is active	7758
Firmware of NRP-Z Power Sensors can be updated via R&S®SMB100A	7697
Improved behavior of ATT FIX Mode when configured while RF is OFF	7599
Frequency offset can be set up to 67GHz	7496
SMB-B5: RDS Settings are now under the scope of Factory Preset	7472
Improved Security concept (menu **SETUP** Security Settings)	7449
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	7383
New SCPI command *:SYSTem:SHUTdown* powers off instrument via remote control	7214
External USB keyboards: Support of international keyboard layouts	7133
Support of up to four power sensors in Power Viewer. New **SETUP** NRP-Z Info dialog provides properties of all power sensors connected. In Addition, sensor firmware can be updated via instrument.	7010
Improved file selector and file manager	5996

Fixed issues

SYSTem:KLOCk ON|OFF not working	7966
SCPI command PM:SOUR INT,EXT not working as expected	7908
Removed Ext Mod impedance setting for instruments not supporting this feature	7829
Network settings (e.g. IP-Address) were lost when configured while no network is attached	7761
Missing error message when attempting to disable USB mass storage while storage is attached	7695
SMB-B5: Several issues regarding Pilot Phase setting	7664
Pulse generator: PRESET values lead to settings conflict after enabling double pulse	7638
Several issues regarding SCPI MMEM subsystem	7488
List Mode Step: Reset button does not work	7468
Firmware restarts when executing READ:POW? while no sensor is connected	7454
List Mode: Downloading lists by means of SCPI binary format does not work	7304
Coincidental mapping of power sensors in Power-Viewer dialog	7294
External pulse input unintentionally synchronized to internal 100MHz reference frequency	7067
Several minor issues when modifying sweep settings	6282
Mouse pointer disappears even if wheel is handled	6277

2 Information on remote emulations

The R&S®SMB100A signal generators offer a remote emulation feature that makes it possible to control the instrument by commands other than the built-in native SCPI commands. This feature allows the user to replace signal generators, e.g. from other manufacturers, with the R&S®SMB100A without having to change the remote control code. Further information regarding this feature can be obtained from **www.rohde-schwarz.com**.

Firmware version 2.20.382.70 supports the following remote emulations:

Emulated device	Device description	Required options
AF2023	2023 signal generator from Aeroflex / IFR / Marconi	
AF2024	2024 signal generator from Aeroflex / IFR / Marconi	
AF2030	2030 signal generator from Aeroflex / IFR / Marconi	
AF2031	2031 signal generator from Aeroflex / IFR / Marconi	
AF2032	2032 signal generator from Aeroflex / IFR / Marconi	
AF2040	2040 signal generator from Aeroflex / IFR / Marconi	
AF2041	2041 signal generator from Aeroflex / IFR / Marconi	
AF2042	2042 signal generator from Aeroflex / IFR / Marconi	
AN68017	68017 signal generator from Anritsu	B112, B120, B140, B112L, B120L, B140L
AN68037	68037 signal generator from Anritsu	
E4421	E4421 signal generator from Agilent Technologies	
E4422	E4422 signal generator from Agilent Technologies	
E4428	E4428 signal generator from Agilent Technologies	
E8257	E8257 signal generator from Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
E8663	E8663 signal generator from Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP8340	8340 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP8341	8341 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP83620	83620 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L

HP83630	83630 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP83640	83640 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP83711	83711 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP83712	83712 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP83731	83731 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP83732	83732 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
HP8642	8642 signal generator from Hewlett-Packard / Agilent Technologies	
HP8643	8643 signal generator from Hewlett-Packard / Agilent Technologies	
HP8644	8644 signal generator from Hewlett-Packard / Agilent Technologies	
HP8645	8645 signal generator from Hewlett-Packard / Agilent Technologies	
HP8647	8647 signal generator from Hewlett-Packard / Agilent Technologies	
HP8648	8648 signal generator from Hewlett-Packard / Agilent Technologies	
HP8656	8656 signal generator from Hewlett-Packard / Agilent Technologies	
HP8657	8657 signal generator from Hewlett-Packard / Agilent Technologies	
HP8664	8664 signal generator from Hewlett-Packard / Agilent Technologies	
HP8665	8665 signal generator from Hewlett-Packard / Agilent Technologies	
HP8673	8673 signal generator from Hewlett-Packard / Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
N5161	N5161 signal generator from Agilent Technologies	
N5181	N5181 signal generator from Agilent Technologies	

N5183	N5183 signal generator from Agilent Technologies	B112, B120, B140, B112L, B120L, B140L
SML01	R&S®SML01 signal generator from Rohde & Schwarz	
SML02	R&S®SML02 signal generator from Rohde & Schwarz	
SML03	R&S®SML03 signal generator from Rohde & Schwarz	
SMR20	R&S®SMR20 signal generator from Rohde & Schwarz	B112, B120, B140, B112L, B120L, B140L
SMR27	R&S®SMR27 signal generator from Rohde & Schwarz	B112, B120, B140, B112L, B120L, B140L
SMR30	R&S®SMR30 signal generator from Rohde & Schwarz	B112, B120, B140, B112L, B120L, B140L
SMR40	R&S®SMR40 signal generator from Rohde & Schwarz	B112, B120, B140, B112L, B120L, B140L
SMT03	R&S®SMT03 signal generator from Rohde & Schwarz	
SMY01	R&S®SMY01 signal generator from Rohde & Schwarz	
SMY02	R&S®SMY01 signal generator from Rohde & Schwarz	

3 Firmware Update

3.1 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.

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

3.2 Updating the Firmware

Required equipment

Software: Firmware update file SMB_2.20.382.70.rsu

Hardware: USB memory stick with enough free space to save the update file (about 40 - 80 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®SMB100A:

- 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.

Check for stereo coder firmware update (SMB-B5)

The option SMB-B5 contains its own local firmware. During reboot the instrument firmware checks whether an update of the stereo coder firmware is required.

- If the stereo coder firmware is already up to date, the instrument starts as usual. Wait until it is operational and continue with internal adjustments.
- If an update is required it is automatically performed by the new instrument firmware. Follow instructions and wait until firmware confirms success. The update may take several minutes.

NOTICE

Risk of instrument malfunction!

Interrupting the stereo coder firmware update may lead to instrument malfunction. Therefore, do not interrupt the stereo coder firmware update and do not switch off power until instrument confirms success.

During update, RDS Settings will be reset to factory values.

Execute internal adjustments

Internal adjustments will be performed automatically during first power on after firmware update. So no further action is required.

NOTICE

Risk of damage for device under test!

During adjustment, assemblies **without step attenuator** (SMB-B112L, SMB-B120L and SMB-B140L) temporarily provide high power at the RF plug. This may cause damage to the device under test (DUT). So it is recommended to disconnect the DUT and replace it by a 50 ohm terminating resistor.

Internal adjustments can be initiated manually (e.g. after warming up) by performing the following steps:

- Press the PRESET key on the instrument front panel.
- Press the SETUP key, select Internal Adjustments and execute **Adjust All**.

Adjustments requiring external measurement equipment are not affected by the firmware update.

3.3 Alternative update procedures

Depending **on the current firmware version** additional methods for updating the firmware are available:

- **Apply USB memory stick while instrument is powered off**
  The previously described firmware update procedure can also be initiated by applying the USB memory stick while instrument is powered off. In this case the update procedure is triggered during startup sequence right after the operating system is ready but before the instruments firmware starts. So this procedure is recommended if for some reason the instruments firmware is not operational. User data is preserved.

- **Update firmware be means of the maintenance system**
  The R&S®SMB100A is equipped with a maintenance system which does not depend on the instruments operating system and firmware. It is activated by pressing the rotary knob right after power on when the instrument indicates “Press rotary knob for maintenance”. Enter security key if requested (default is ‘123456’), select “Install Firmware Package” and follow instructions. This procedure reinitializes the instruments mass memory storage, so **user data is irretrievably lost**. After reboot execute SETUP Factory Preset to complete instrument initialization.

- **Recover factory firmware version**
  Factory firmware configuration of the instrument can be recovered using the “Factory Recover” option of the maintenance system. **User data is irretrievably lost**. After reboot execute SETUP Factory Preset to complete instrument initialization.

4 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).

LINUX® is a trademark of Linus Torvalds.

Rohde & Schwarz would like to thank the open source community for their valuable contribution to embedded computing.

5 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.

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