

R&S®SMB100A

Release Notes

Firmware Version 5.00.116.88

PAD-TM: 3574.3288.02/05.00.CI/1/EN

ROHDE & SCHWARZ

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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 5.00.116.88 is suitable for all instruments of type R&S®SMB100A including all options. This includes frequency options SMB-B101, SMB-B102, SMB-B103, SMB-B106, SMB-B112, SMB-B112L, SMB-B120, SMB-B120L, SMB-B131, SMB-B140, SMB-B140L and SMB-B140N. Furthermore, it is suitable for instruments of type SMB100N (Model K31).

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. New module revisions as well as improved structure of calibration data may not be supported by older firmware versions.

It is strongly recommended to update the firmware by means of the maintenance system, as described in chapter 4. This avoids interference between the existing and the new firmware. All user data on the instrument will be deleted during update.



The frequency and level setting times are slightly increased (about 100µs) by this firmware version. So according with this version the data sheet has been modified to reflect the extended setting times. Nevertheless, the setting times typically fulfill the previous specification.

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 "Information on Remote Emulations".

1.1 Version 5.00.116.88

Released September 2022

Improvements

| Version | Improvements |
|---------|--|
| 980891 | List-Mode "Extern Step" not working on some instruments |
| 380954 | Unintended settings conflict at particular level settings when attenuator is fixed and AM is enabled |
| 978734 | Reference Oscillator: On instruments with TCXO the factory adjustment value is not saved properly |

Known issues

| Version | Known Issues |
|---------|--|
| 12845 | Sometimes the SMZ multiplier is not recognized during power on. Workaround: Power up SMB before connecting or powering the SMZ |
| 947017 | Pulse Generator: Trigger mode Single is triggered by external trigger too. |
| 978836 | Wrong serial number of OCXO module in hardware config dialog, too low by 65536 |

1.2 Version 5.00.116.85

Released May 2022

New functionality

| Version | Functions |
|----------------------------------|--|
| Information on Remote Emulations | Consecutive identical messages are bundled in info history and SCPI message queue to prevent both from being flooded and squeezing out other messages. |

Modified functionality

| Version | Functions |
|---------|---|
| 365752 | SMB-B5: Improved noise ratio at small deviations because of optimized internal leveling |
| 456033 | Sweep and List-Mode will be switched off in case of considerable overrun conditions |
| 494280 | Support of smart cards of type "Java Card" |
| 904541 | Date/Time dialog: Format of "Date" according to ISO8601 (YYYY-MM-DD) |

Improvements

| Version | Improvements |
|---------|--|
| 238854 | Edit Dialog: "Save As" sometimes not working as expected |
| 380954 | After viClear remote connection via USB not working properly |
| 433429 | NRP-Z Level Control not operational |
| 441643 | Active Power Viewer overstretches frequency settling time |
| 545807 | Power sensor: General database error after :POW:ALC:SONCe |
| 629970 | List-Mode: Output Valid arises to early on instruments with mechanical step attenuator (SMB-B140) |
| 753170 | Power sensor: S-parameters not taken into account |
| 773838 | Unexpected settings conflict at particular level settings when attenuator is fixed and AM is enabled |
| 777561 | Sweep overrun at frequencies above 20GHz |
| 781867 | Several issues around sensor mapping dialog |
| 879120 | SMB-B5: Several characters of RDS character table not displayed correctly |
| 885891 | Pulse Modulation: Unexpected pulse when switching rf off while pulse is not triggered |
| 895270 | List-Mode: On some instruments execution mode Extern Step not operational, throwing message Unhandled interrupt... |
| 921302 | Several Tree-View and table controls cannot be addressed by means of ENTER/x1 key |
| 946938 | List-Mode: Combination of missing external reference frequency and extern step leads to firmware stall |
| 962351 | Unintended message "ALC unlocked" during internal adjustments |

1.3 Version 4.20.028.58

Released May 2018, microwave instruments only (SMB-B112 and up)

New functionality

| Version | Functions |
|---------|--|
| 275223 | Support of RF board 1406.8903.01 / .02 |
| 275223 | Support of step attenuator 1412.5431.01 / .02 / .08 |
| 297166 | Security: New Volatile Mode redirects user data to non-persistent memory |

Modified functionality

| Version | Functions |
|---------|---|
| 365704 | Reduced interruption of output signal when changing instrument settings, e.g. FM Deviation. |
| 365752 | SMB-B5: Improved signal/noise ratio due to optimized internal levelling |

Improvements

| Version | Improvements |
|---------|---|
| 209304 | SMB-B5: Phase of multiplex signal inverted, positive half waves cause lower frequency |
| 299323 | If RF is smaller than 24MHz, unexpected external interrupts may occur, e.g. effecting external triggered sweep or list mode |
| 341241 | NRP-Z Power Viewer: Current frequency not updated in sensor |
| 365816 | Unexpected blanking of RF signal when modifying FM depth |

Known issues

| Version | Known Issues |
|---------|--|
| 433429 | NRP-Z Level Control is not operational |
| 441643 | Frequency setting time is extended while NRP-Z Power Viewer is active |
| 12845 | Sometimes the SMZ multiplier is not recognized during power on. Workaround: Power up SMB before connecting or powering the SMZ |

1.4 Version 3.20.390.24

Released January 2016

New functionality

| Version | Functions |
|---------|---|
| 151689 | Support of new NRPxS(N) Power Sensors |
| 138026 | Support of new frequency options SMB-B140N and SMB-B131 |

Modified functionality

| Version | Functions |
|---------|---|
| 138134 | Calibration value of oscillator can be changed using protection level 2 |
| 138071 | Improved FM deviation for stereo modulation up to 200 kHz |
| 137801 | Sweep will be stopped after modification of the swept value e.g. RF frequency |
| 137541 | Factory Preset of "RF OFF Mode" depends on the installed hardware features. Devices with a mechanical step attenuator => "Full Attenuation" Devices without a mechanical step attenuator => "Unchanged" |

Improvements

| Version | Improvements |
|---------|---|
| 141332 | Step attenuator bouncing with ALC mode S&H at RF output |
| 138136 | Pulse Train repetition was not updated after editing |
| 138105 | In rare cases a message "Command header too long" was incorrectly displayed |
| 137875 | RF output power was not adjusted properly after pulse modulator activation |
| 137823 | Repeated settings of the RF phase results in an increased setting time |

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.

All of the subsequent emulations are available regardless of the configuration of the instrument. In order to meet the frequency range of the emulated instruments, the table points out recommended options.

Further information regarding this feature can be obtained from www.rohde-schwarz.com.

Firmware version **Fehler! Unbekannter Name für Dokument-Eigenschaft.** supports the following remote emulations:

| Emulated device | Device description | Recommended 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 | |

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|---------|---|---------------------------------------|
| 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 |
| HP8360 | 8360x signal generator family 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 |
| HP83622 | 83622 signal generator from Hewlett-Packard / Agilent Technologies | B112, B120, B140, B112L, B120L, B140L |
| HP83623 | 83623 signal generator from Hewlett-Packard / Agilent Technologies | B112, B120, B140, B112L, B120L, B140L |
| HP83624 | 83624 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 |
| HP83650 | 83650 signal generator from Hewlett-Packard / Agilent Technologies | B112, B120, B140, B112L, B120L, B140L |
| HP8373 | 8373 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 |

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|---------|--|---------------------------------------|
| 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 |

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|--------|---|---------------------------------------|
| N5161 | N5161 signal generator from Agilent Technologies | |
| N5181 | N5181 signal generator from Agilent Technologies | |
| N5183A | N5183A signal generator from Agilent Technologies | B112, B120, B140, B112L, B120L, B140L |
| PA8303 | 8303 signal generator from Panasonic | |
| RC3102 | RC3102 signal generator from Racal Dana | |
| RC9087 | RC9087 signal generator from Racal Dana | |
| SME02 | R&S®SML01 signal generator from Rohde & Schwarz | |
| SME03 | R&S®SML02 signal generator from Rohde & Schwarz | |
| SME06 | R&S®SML03 signal generator from Rohde & Schwarz | |
| 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 | |
| SMP02 | R&S®SML01 signal generator from Rohde & Schwarz | B112, B120, B112L, B120L |
| SMP03 | R&S®SML02 signal generator from Rohde & Schwarz | B112, B120, B140, B112L, B120L, B140L |
| SMP04 | R&S®SML03 signal generator from Rohde & Schwarz | B112, B120, B140, B112L, B120L, B140L |
| 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 |
| SMT02 | R&S®SMT03 signal generator from Rohde & Schwarz | |

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| 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 Modifications to the documentation

The current documentation is up-to-date. The data sheet has been adapted to reflect the increased setting times for frequency and level.

4 Firmware update

NOTICE

Risk of damage for device under test!

When instrument is restarted after update, internal adjustments will be executed automatically. 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). It is recommended to disconnect the DUT and replace it by a 50 ohm terminating resistor.

Instruments with stereo coder SMB-B5

The stereo coder contains its own separate firmware. During restart, its version is checked automatically and an update is offered if necessary. Please confirm.

4.1 Updating the firmware

Required equipment

Software: Firmware update file SMB_5.00.116.88.rsu

Hardware: USB memory stick with enough free space to save the update file (at least 128 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 off instrument.
- Press and hold rotary knob while powering instrument. Message “Booting into maintenance system” appears.
- Enter system password. Default is “123456”.
- Plug USB stick to instrument.
- Select “Install firmware package”.
- Select SMB_5.00.116.88.rsu.
- Wait until message “Attention! System partition will be deleted...” appears. Confirm with “Yes”.

- After erasure the firmware update procedure starts automatically.
- Wait until completion and execute "Power off".
- Remove USB stick.

Restart instrument

- Switch on instrument and wait until optional stereo coder update and internal adjustments are completed.
- Press the setup knob and execute "Factory Preset" in order to initialize several instrument settings, e.g. the network name.

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 initiated 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 in general no further action is required. However, 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.

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.

4.2 Alternative update procedures

- **Apply USB memory stick while instrument is powered on**

The instrument detects the USB memory stick and checks the root directory for applicable update packages. If found, user is asked if he wants to apply an update and which version is desired. User data is preserved. This procedure requires some compatibility between the running and the new software package. Otherwise the new software is not accepted (Archive corrupted”).
- **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 instrument's firmware starts. So this procedure is recommended if for some reason the instrument's firmware is not operational. User data is preserved.
- **Update firmware remotely via LAN**

Since firmware version 3.01.203.32 subsequent updates can also be performed via LAN. This procedure does not require any physical interaction with the instrument and therefore can be executed without having the instrument on-site. To initiate the update copy the firmware update file via FTP to **/home** directory or via SCP to **/home/instrument/update** directory. Update starts automatically after transfer is complete. Please ensure that the required LAN services are enabled in security settings menu (FTP, SSH and Software Update).
- **Update firmware by means of the maintenance system**

The R&S®SMB100A is equipped with a maintenance system which does not depend on the instrument's 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 instrument's mass memory storage, **so user data is irretrievably lost**. After reboot execute **SETUP** Factory Preset to complete instrument initialization.

5 Customer support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz product, contact our customer support center. A team of highly qualified engineers provides support and works with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz products.

Contact information

Contact our customer support center at www.rohde-schwarz.com/support or follow this QR code:



Figure 5-1: QR code to the Rohde & Schwarz support page