

# R&S®SMA100B

## Release Notes

**Firmware Version 5.10.121.26**

© 2023 Rohde & Schwarz GmbH & Co. KG  
Muehldorfstr. 15, 81671 Munich, Germany  
Phone: +49 89 41 29 - 0  
E-mail: [info@rohde-schwarz.com](mailto:info@rohde-schwarz.com)  
Internet: <http://www.rohde-schwarz.com>

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1419.8588.00 | Version 08 | R&S®SMA100B |

The software makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" provided with the product.

The following abbreviations are used throughout this document: R&S®SMA100B is abbreviated as R&SSMA100B

PAD-TM: 3574.3288.02/04.00/CI/1/EN

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# 1 Information on the current version and history

## NOTICE

Specified frequency setting times are increased by 0.2 ms with firmware version 5.10.121.26 and higher for instruments without high power option (R&S®SMAB-B35, R&S®SMAB-B37, R&S®SMAB-B39).

Instruments with option ultra low phase noise (R&S®SMAB-B711) are increased by 0.5 ms.

See the data sheet, version 07.03 on the R&S®SMA100B product page:  
[www.rohde-schwarz.com/brochure-datasheet/sma100b](http://www.rohde-schwarz.com/brochure-datasheet/sma100b)

## NOTICE

Specified frequency setting times for instruments with firmware version 5.00.122.23 and higher are increased by 0.2 ms. Devices with option R&S®SMAB-B711 are not affected.

## 1.1 Special hints for particular instruments

From serial number 102000 onwards the following options are fully supported:

R&S®SMAB-K724	High dynamic uninterrupted level sweep
R&S®SMAB-B28	Ramp sweep
R&S®SMAB-B709	Low phase noise
R&S®SMAB-K721	Scan AM

## 1.2 Version 5.10.121.26

Released: July 2023

### New Options

R&S®SMAB -K980 HUMS (Health and utilization monitoring system)

905697

## New Functionality

None	643983
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## Improvements / Fixed Issues

R&S®SMAB-K28 Power analysis: the trace is shown before the trigger point.	981334
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R&S®SMAB-K28 Power analysis: enabled for power sensors other than NRP-Z8x.	936822
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R&S®SMAB-K28 Power analysis: frequency sweep starts only in RF state on.	1001093
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R&S®SMAB-K28 Power analysis: title "NRP-Z Power Analysis" changed to "NRP Power Analysis" to extend scope to additional power sensor types.	949720
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SENS:POW:FREQ? MIN / MAX now returns the correct value after sensor mapping has been changed.	745428
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R&S®SMAB-B28 Ramp Sweep: improved stability during a long sweep time in small frequency ranges.	979987
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R&S®SMAB-K703 100 MHz, 1GHz reference input and output: The reference output mode loop through can be activated.	995908
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Complete support of new CPU (IPM20), including selftest.	999412
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Support of selftest OPU3_AF.	1080823
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Correct overload message depending on Ext1 and Ext2 input.	849401
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Correct size of inserted SD card is displayed.	910717
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Internal adjustments (delayed) can be configured to start automatically after warm up period and switch off the instrument after execution. Using this function, you can execute adjustments without being on-site and start measurements directly when back.	1042855
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Improved internal adjustments with option super ultra high output power (R&S®SMAB-B36S).	1052488
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Improved internal adjustments in the frequency range from 20 GHz to 40 GHz with option ultra high output power (R&S®SMAB-K36 or R&S®SMAB-K38 or R&S®SMAB-K40).	1086095
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Emulation: N5181B: ·SOUR:ROSC:SOUR:AUTO ON is handled as SOUR:ROSC:SOUR:EXtErnal. ·SOUR:ROSC:SOUR:AUTO OFF is handled as SOUR:ROSC:SOUR:INTernal.	1039392
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Emulation: AF2041 unintended modifications of avionic modes.	956380
--	--------

## 1.3 Version 5.00.122.24

Released: June 2022

### Improvements / Fixed Issues

Elimination of an occasionally incorrect working "internal adjustments" of the frequency options R&S® SMAB-B112, R&S® SMAB-B131 and R&S® SMAB-B150(N) compared to the former version 5.00.122.23

976363

## 1.4 Version 5.00.122.23

Released: June 2022

### New Functionality

Phase-Continuous Mode:

When the phase continuous mode is activated the R&S SMA100B output cw signal is phase continuous when changing the frequency.

391711

For specification details please refer to the corresponding chapter in the data sheet.

### Improvements / Fixed Issues

RF: List Mode: first frequency step is sometimes not executed	734216
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Better firmware stability during the execution of Preset	892689
--	--------

SCPI: *ESR? and *STB? can not be accessed asynchronously during sensor nulling	843068
--	--------

Extended SCPI command list of the AF2041 emulation	771183
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Analog modulation: Overview tab can not be addressed by rotary knob	808545
---	--------

Reset of Combined Sweep via SCPI command does not work	855985
--	--------

Depending on the sweep range during a frequency sweep in ramp mode, it can happen that the YIG (part of option SMAB-B711) has not yet completely finalized the retrace to the start frequency. This issue has been solved. 923515

The adjustment date is only updated when the adjustment completed 870566

If RF is OFF the VSWR is constant while changing level values 889761

R&S® SMAB-B29: Differential clock synthesizer  
Small frequency and level changes should have no effect on the phase output of the clock synthesizer. 889871

If you execute adjust all, with option R&S® SMAB-B36S Super Ultra High Power, please terminate the RF output with 50 Ohm termination resistor (2watt/33dBm) Without a termination adjust all will be automatically aborted. 870009

## 1.5 Version 4.70.205.117

Released: August 2021

### New Options

R&S® SMAB-B36S Super Ultra High Power

### New Functionality

In the menu Pulse Generator the Pulse Repetition Frequency is displayed now 643983

### Modified Functionality

R&S® SMAB -B28 (Ramp Sweep):  
If the RF up-sweep is blank free the retrace is also blank free. The "Signal Valid" connector shows for the retrace the corresponding "not valid" signal. 867465

### Improvements / Fixed Issues

Without option R&S® SMAB-K720 and when the rotary knob is operated under Modulation -> ... -> "Overview" the GUI (graphical user interface) is frozen. 734216

Devices with option R&S® SMAB-B140N, R&S® SMAB-B150N and R&S® SMAB -B167N: The external pulse duration is correct now. Known issue from software version 4.70.205.75 809206

Correct output power for levels below -70 dBm and for frequencies below 100 kHz.

Devices with the following options were affected:

R&S® SMAB-B150(N) without R&S® SMAB-B37 (High Power) 820558

R&S® SMAB-B167(N) without R&S® SMAB-B39 (High Power)

Improve internal level adjustment to avoid ALC unlocked 821981

Improve internal level adjustment of option R&S® SMAB-B29 (differential clock synthesizer) 866940

### Known-Issues

When the option R&S® SMAB-B36S Super Ultra High Power is installed the parameter "Step Attenuator below 20 GHz" in the RF level menu does not show an effect. The default "preset" is active. 813340

If you execute adjust all, with option R&S® SMAB-B36S Super Ultra High Power, please terminate the RF output with 50 Ohm termination resistor (2watt/33dBm)

## 1.6 Version 4.70.205.75

Released: February 2021

### New Options

R&S® SMAB-K725 New analog modulation chirp

### New Functionality

R&S® SMAB-B28 Ramp Sweep is now available for all R&S® SMAB frequency options

Further instrument emulations are available. For details please refer to: <https://www.rohde-schwarz.com> and search for: Replacing obsolete instruments - R&S®Legacy Pro

New combined sweep mode. In addition to the frequency or level sweep a combined frequency and level sweep is now available. The number of steps determines the step size depending on the start and stop value of the frequency and level sweep settings.

### Modified Functionality

The internal adjustments does not change the latest status of the external reference outputs.  
 Exception: in loop through mode, the latest status might change 619393

#### Improvements / Fixed Issues

The pulse delay works as intended	734216
Pulse train works now with large tables	643130
Fixed spike via the pulse video connector at the beginning of the pulse train in external trigger mode	514945
Improved pulse overshoot behavior between 40 GHz and maximum frequency	638342
Fixed: the displayed information "Reference locking in progress" sometimes does not disappear until rebooting the device	311646
After touching the display the mouse operation might be interfered and remote control via VNC might not work.	489231
FW long term stability issue fixed. With a R&S® SMAB-B29 clock synthesizer installed it can happen after long operation times (several weeks) that the SMA100B is somehow blocked	561470
User menus now can be saved and recalled, allowing to copy the configuration to other signal generators.	562761
The preset works now also for the delta phase	598229
Fixed: If the RF level sweep is not operated in settings characteristic "Auto", changing the level setting parameters during the sweep can lead to incorrect output levels.	533395
R&S® SMAB-K721 (SCAN AM) is now working for $f > 52$ MHz	610027
R&S® SMAB-K724 (High dynamic uninterrupted level sweep) is now working for $f > 52$ MHz	610027
The polarity of the signal valid connector can be selected. (-> System -> RF Connectors)	617463
Improve internal adjustments for SMAB-K721 and SMAB-K724 (Scan AM & High dynamic uninterrupted Level Sweep)	597717
Mechanical attenuator: correct handling of *OPC? and switching interval during RF ON / OFF	626539
Improvements of User Correction (UCOR) above 40 GHz	634396
Fixed: SMAB-K25 (ILS): [:SOURce]:MBEacon[:MARKer]:FREQuency fails in SMA100A emulation mode	636163
Harmonic Filter ON Mode works below 3.7 GHz	635432
Listmode table entries are now considering the multiplier and offset	621656
Avionic Modulation: Ext AM works now in ILS Glide Slope and ILS Localizer mode	634396



If power sensor is connected to channel 2, the Power Viewer on the signal generator is running and the power sensor is also used to fill a UCOR list with "fill with sensor" a dead lock is fixed. 729160

#### Known-Issues

Devices with option SMAB-B140N, SMAB-B150N, SMAB-B167N: If an external pulse generator signal is applied, the pulse duration is extended by approx. 3-5 ns

## 1.7 Version 4.60.112.29

Released: May 2019

#### New Functionality

New shape "Square" is available for LF Generator LF1 and LF2.

The square on/off ratio is always 50%.

The repetition interval can be set in the frequency dialog (below the shape menu)

Further instrument emulations are available. For details please refer to: <https://www.rohde-schwarz.com> and search for: Replacing obsolete instruments - R&S@Legacy Pro

#### Modified Functionality

LF Generator: the corresponding SCPI command for the shape "PULSE" is:

:SOURce1:LFOuTput1:SHApe PULS

of the previous one in former software versions was:

:SOURce1:LFOuTput1:SHApe SQU

551638

#### Improvements / Fixed Issues

Avionics LOC/GS: Deviation has been corrected for single component (90Hz or 150Hz) 571505

Avionics: MOD On/Off key and led works as expected 571509

Mode Low Noise in FM Modulation works reliable 543294

FM/Phim: New settings-conflict: "frequency vs. deviation vs. modulation-mode" 231379

Stable communication between the power sensor and the signal generator. In former versions a long term communication caused a reboot of the SMA100B. 522499

Improved detection of a connected USB power sensor during a restart of the SMA100B 513538

	368316
Power Analysis - Timing mode 'High Precision' is removed	547616
Sweep and List-Mode will be switched off in case of considerable overrun conditions.	456033
LF Output: A new value "Load Impedance" in certain emulations.	542234
Fixed issue: NRP18S-20 connected to SMA100B shows wrong read out	544249
The stability of the software has been increased	528345
Quick changes of a numeric parameter may cause the SMA100B to reboot	528236
Fixed issue: Switching bandwidth of the main synthesizer (Main PLL Bandwidth) works as expected	537152

#### Known-Issues

If RF-Sweep is running and the RF Level Setting Characteristics isn't set to 'Auto', changes on RF level parameters may lead to wrong output power. It is recommended to make first all level settings before the level sweep is started	512700
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## 1.8 Version 4.50.090.24

Released: December 2018

#### New Options

R&S® SMAB-K25	Signal Generation for VOR and ILS
R&S® SMAB-K724	High dynamic uninterrupted level sweep
R&S® SMAB-K28	Power Analysis

#### New Functionality

More instrument emulations are available. Please have a look at: <https://www.rohde-schwarz.com> and search for: Replacing obsolete instruments - R&S® Legacy Pro

#### Modified Functionality

Execution of internal adjustments only in case a 50 Ohm resistor is connected to the RF output.	471984
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#### Improvements / Fixed Issues

Short dwell times can now be set, even in case a power sensor is connected.	441643
Unify the dwell times in sweep and listmode (1ms to 100s)	455790

Last Full Adjustment dialog is only updated when the complete adjustment has passed successfully	481890
Switching the external keyboard language does not affect the front panel buttons anymore	488651
RF Frequency: Setting range of frequency multipliers allows now negative values.	507979
Fixed file manager can crash during create new directory	508530
Improve the resolution of FM deviation	415794
Pulse modulation related issues of the Aeroflex 2032 emulation fixed	469010

#### Known-Issues

"Mod On" is missing on the home screen when an avionic standard together with pulse modulation is activated	512700
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## 1.9 Version 4.30.040.33

Released: July 2018

#### New Options

R&S® SMAB-B28	Ramp Sweep
R&S® SMAB-B709	Low Phase Noise
R&S® SMAB-K721	Scan AM

#### New Functionality

More instrument emulations are available. Please have a look at: <https://www.rohde-schwarz.com> and search for: Replacing obsolete instruments - R&S® Legacy Pro

New Trigger Mode "Single" in the pulse generator menu

#### Modified Functionality

LF Output supports the combination of two paths (LFGen1 + LFGen2)	366247
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#### Improvements / Fixed Issues

AM Modulation Depth of channel 2 was not taken into account.	321925
Improved SMA100A Emulation regarding LFGGen and FM behavior	329215 / 413094
In some cases, ALC unlocked was briefly displayed when the frequency setting changed.	397376
In Attenuator Mode Fixed, RF On/Off works as designed	435332
Selftest (*TST?) did not work with active remote emulation	356882
Under seldom circumstances, legacy commands for pre-SCPI R&S generators might fail.	316728
Pulse Train handles properly zero pulses at the end of the train	302264
Now toggle Pulse Output State has no side effect on pulse modulation	313943
Noise Generator works as designed	333601
Improved file manager and the function help export	343476
Correct harmonic filter setting over 3.7 GHz	388458
Improved FM modulations between 8 MHz und 350 MHz	401563
Save / Recall with Listmode state On works now	423465
SYSTem:HELP:SYNTax:ALL? take effect	358389
Fixed issue "Device Key missing" during started up of the device	409387
Clk Syn Output can't be switched off if mode SquareDiff is selected	449038

#### Known-Issues

Info "Reference locking in progress" sometimes does not disappear till reboot of device	311646
The option SMAB-B28 comes with the BNC connectors: V/GHZ X-Axis; Z-Axis; Stop; Marker User1 These connectors work only in Rampsweep mode.	450286

## 1.10 Version 4.15.080.54

Released: December 2017

#### Attention

If you install firmware 4.15.080.54, it is recommended to update the PCI device COM-FPGA under [Setup/Maintenance/FPGA  $\mu$ C Update].

- ▶ You must execute this update, because the SMA100B **will not work without upgrading!**

- ▶ After upgrade the PCI device COM-FPGA, **the downgrade to an earlier firmware version is no more possible!**

### New Functionality

More Remote emulations are available (AF2042(ADF)). Please have a look at: <https://www.rohde-schwarz.com> and search for: Replacing obsolete instruments - R&S@Legacy Pro

New Trigger Mode "Single" in the pulse generator menu

### Modified Functionality

None

### Improvements / Fixed Issues

Power sensor: correct setting of average filter depending on sensor type	312938
LAN power sensor: improve behavior of rescans	321178
LAN power sensor: reducing start up time of SMA100B, in case a mapped LAN sensor is not available	336109
FM Modulation deviations: 12.5 MHz, 25 MHz, 50 MHz, 100 MHz	323129
Display correct attenuator level range	327497
Correct behavior of attenuator mode "Fixed"	337497
Zeroing of NRP-Zxx power sensors	334454
The paste button in the file manager is active, so it is possible to copy-paste files to a USB stick.	343476
Pulse generator at mode "Ext Single": now the "Pulse Delay" take affect	356189
Pulse generator at mode "Ext Triggered": now the "Pulse Delay" worked as expected	356189
RF Level Blanking is avoided for level settings characteristics Uninterrupted	327520
Reduced blanking for small frequency changes	374451
User Correction "Fill With Sensor" can be executed	375567/334452
Selftest is now also available, if an instrument emulation is active	345897

### Known-Issues

Info "Reference locking in progress" sometimes does not disappear till reboot of device 311646

Harmonic Filter mode "Auto" in RF Level Settings without effect	388458
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## 1.11 Version 4.15.010.12

Released: May 2017

### New Options

R&S® SMAB-B112    Frequency Range: 8 kHz to 12,75 GHz

R&S® SMAB-B120    Frequency Range: 8 kHz to 20 GHz

### New Functionality

Support of new power sensors ([R&S®NRPxxS/SN](#), [R&S®NRP18S-xx](#), [R&S®NRPxxT/TN](#), [R&S®NRPxxA/AN](#), )

### User Correction

Sanitizing of user data and instrument settings

Emulation of SMA100A / SMF100A (SCPI compatibility)

### Modified Functionality

None

### Improvements / Fixed Issues

Improved FM LowNoise-Modulation for devices without R&S® SMAB-B711, R&S® SMAB-B711N

No RF signal after power on	319849, 314078
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Accurate dwell time during sweep	309641
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### Known-Issues

LAN power sensor: Restart of SMA100B necessary after multiple rescans	321178
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Info "Reference locking in progress" sometimes does not disappear till reboot of device

311646

## 1.12 Version 4.00.050.12

Released: April 2017

### Firmware package contents

#### Contents

R&S® SMA100B Firmware

### New Functionality

#### Functions

Initial firmware version for R&S® SMA100B

R&S® SMAB-B1H: OCXO with high performance

R&S® SMAB-B29: Differential clock synthesizer

R&S® SMAB-B32: Ultra high output power 3 / 6 GHz

R&S® SMAB-B85: Removable mass memory

R&S® SMAB-B86: Remote control GPIB / USB

R&S® SMAB-B92: Height unit 2 HU

R&S® SMAB-B93: Height unit 3 HU

R&S® SMAB-B103: Frequency Range: 8 kHz to 3 GHz

R&S® SMAB-B106: Frequency Range: 8 kHz to 6 GHz

R&S® SMAB-B710(N): Improved close in phase noise

R&S® SMAB-B711(N): Ultra low phase noise

R&S® SMAB-K22: Pulse modulator

R&S® SMAB-K23: Pulse generator

R&S® SMAB-K24: Multi function generator

R&S® SMAB-K27: Pulse train

R&S® SMAB-K31: High output power 3 / 6 GHz

R&S® SMAB-K703: 100 MHz, 1 GHz reference input / output

R&S® SMAB-K704: Flexible reference input from 1 MHz to 100 MHz

R&S® SMAB-K720: AM / FM / PhiM

R&S® SMAB-K722: Differential clock synthesizer extension up to 6 GHz



## Modified Functionality

### Functions

None

## Improvements

### Improvements

None

## Known Issues

### Known-Issues

User Correction does not work.

## 2 Modifications to the documentation

The current documentation is up-to-date.

## 3 Firmware update

### 3.1 Validity Information

Device	Order Number
R&S® SMA100B RF and Microwave Signal Generator	1419.8888K02

### 3.2 Downgrade

Generally it is not recommended to use an earlier version than the latest version available. In some cases the older versions do not support the hardware used in your instrument. Before installing this firmware, check if this could happen:

- ▶ Start System Config / Setup / Instrument Assembly / Version/Options
- ▶ In the tab "Firmware", you find the

Downgrade Info:	
Package	Version
Factory Version	SMAB_4.15.
Min. Version	4.15.080.54

- ▶ If the version to be installed is greater or equal than the "Min.Version", the hardware will be supported after downgrading. (However, this cannot be guaranteed for all software options)
- ▶ If the version to be installed is lesser than the "Min.Version", not all of the modules will be supported. **Your instrument will not work after downgrading!**
- ▶ Downgrading may fail using standard rsu-Files (eg. due to changes in the instrument configuration file). In this case, press PRESET-Button during power-on or install ISO image available from service department.

### 3.3 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.

**NOTICE**

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

## 3.4 Updating the Firmware

### Required equipment

- Software:** Firmware update file SMAB\_<version-number>.rsu
- Hardware:** USB memory stick with enough free space to save the update file (about 200 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 to the root directory
- Wait until copy procedure has finished and remove USB stick

### Install new firmware on R&S®SMA100B:

- Connect USB stick to instrument
- Switch on instrument, if instrument is powered off
- Wait a few seconds until "Process Software Update?" message box appears. Confirm by touching the YES Button or 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
- Remove USB stick and touch the Reboot button
- The instrument now reboots.

### Execute internal adjustments (only if indicated)

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

- Press  on the instrument front panel.
- Press , select "Internal Adjustments..." and execute "Adjust All". This procedure updates all internal instrument adjustments and will take several minutes.

**NOTICE****Risk of DUT damage**

During internal adjustments, the instrument temporarily applies high power at the RF output. High power at the RF output may destroy a connected DUT (device under test).

Do not start internal adjustments if DUT is connected. Disconnect the DUT and replace it by a terminating resistor with adequate power rating. It is recommended to use a 50  $\Omega$ , 10W or larger terminating resistor.

Adjustments requiring external measurement equipment are not affected by the firmware update and need not to be performed.

## 3.5 Alternative update procedures

The USB firmware update is recommended for most situations. However, alternative methods for updating the firmware are available:

### 3.5.1 Firmware update over LAN

Instrument settings are preserved during the update, including user data and network settings.

- Get access to the file system of the instrument using ftp (other methods like samba share is also supported, see application note 1GP72 for details).  
Enter `ftp://<ip address or host name>` in the file manager
- Copy **SMAB\_<version-number>.rsu** to directory update
- The update procedure starts immediately
- Execute internal adjustments, if indicated

### 3.5.2 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 **SMAB\_<version-number>.iso**  
**Please contact the service department to get this file!**

##### **Hardware:**

- **External** USB CD or DVD ROM burner with USB cable.
- 1 CD 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 a 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 a recordable CD
- Start Nero StartSmart
- Select medium „CD“
- Select „Create Data CD“
- From the **Files menu**, open file **SMAB\_<version-number>.iso**
- Click "Burn"

- When finished, close Nero and disconnect external USB CD/DVD drive

### **Install new firmware on R&S®SMA100B**

- Instrument must be switched off
- Connect the external USB CD/DVD drive to the R&S®SMA100B
- Switch on Instrument
- The instrument boots from external drive
- Follow the instructions on screen
- Disconnect the external USB device
- Reboot instrument
- Execute internal adjustments, if indicated

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#### **NOTICE**

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.

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## 4 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](http://www.rohde-schwarz.com/support) or follow this QR code:



Bild 4-1: QR code to the Rohde & Schwarz support page