R&S®SMBV100A
Vector Signal Generator
Release Notes
Firmware Version 3.50.082.47

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The firmware of the instrument makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" document on the internet (www.rohde-schwarz.com/firmware/smbv100a/).

The following abbreviations are used throughout this document: R&S® SMBV100A is abbreviated as R&S SMBV100A.

Test and Measurement

Release Notes

ROHDE&SCHWARZ

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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®SMBV100A Vector 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.**

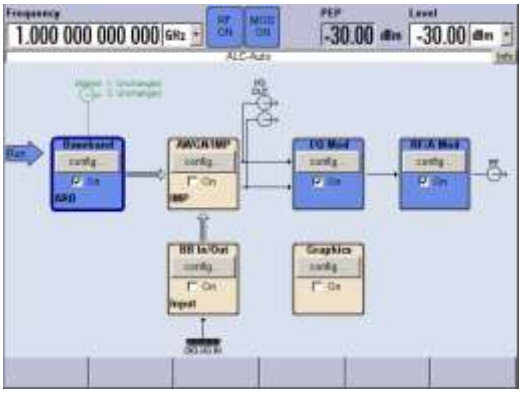
Instruments covered

This firmware version is suitable for all instruments of type **R&S®SMBV100A,** including all module revisions, options and firmware licenses.

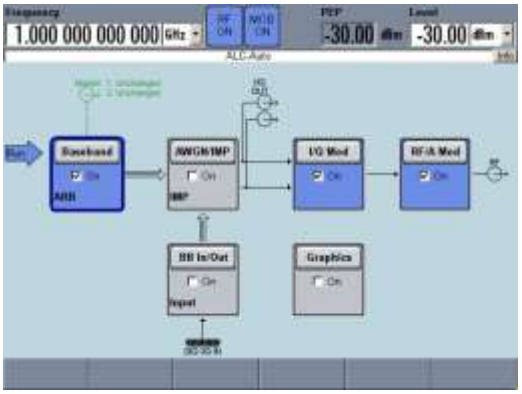
Identify the base board

The latest rsu installation package can be used for both types of base boards. But there may be some restrictions concerning LAN update and firmware downgrade. The type of base board can easily be detected by the look of the block diagram:

Old base board (part number 1406.6700.02):



New base board (part number 1406.6900.02):



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 

Software/Options dialog and it is part of the SCPI *IDN instrument identification string.

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

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. Downgrades shall always be performed using the maintenance system.

1.1 Special hints for particular instruments and firmware versions

Instruments with firmware less than 2.20.160.51

To update these instruments to the current firmware version, follow the update procedure based on **Update firmware by means of the maintenance system**, as described in chapter 2.3.3

1.2 Version 3.50.082.47

Released: March 2017

New Functionality

- SMBV-K360 eraGlonass Test Suite for testing ERA-Glonass modules against the performance criteria specified in the GOST-R-55534/33471 standards.
- GNSS: Position Logging for Hardware in the Loop (HiL) simulations.
- GNSS: Assisted Almanac and Rinex Files now compliant with 3GPP Ref. 37.571-5 Release Version 13.1.0.

Fixed Issues

- RF List mode: In rare cases, the list mode did not work and the instrument was not accessible furthermore.
- RF List mode: If the list mode was active while trying to shut down the instrument, the instrument did not shut down.
- ARB: In rare cases the generated multi segment waveform was corrupt
- AWGN: CW interferer did not work
- SMBV-K80 Bit Error Rate Tester: Various small bug fixes and improvements
- Avionics Modulations DME: The error message missing option SMBV-K151 appeared, if DME state was switch on
- GNSS: Improved Stability of Hardware in the Loop (HiL) simulations. User's manual also updated accordingly.

Known Issues

- Absolute Power issue with DVB when toggling the digital standard state without toggling afterwards the RF state. Similar but minor issues are observed with other digital standards
- Rarely the connection on the Digital Interface cannot be established in the SMBV. This is usually solved by reconnecting and checking the connection state in the SMBV
- XM-Radio (K58): The physical layer mode Terrestrial A and Terrestrial B does not work.
- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions, e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can’t be done automatically. For synchronization, an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported.
- GNSS

  - The Almanac Projection of GLONASS is not realized. It is recommended to choose an Almanac for the same simulated week.
  - Pseudo-Range biases are logged one second later respect to the time of applicability written in the correction file for SBAS
  - GNSS signal distorted when fetched from the SMBV DIG-OUT.
  - Real-Time User changes of Satellite State or Power are displayed in the S.P.O.T view with a latency of 5 seconds. This does not affect the generated RF signal.
  - Issue in the NeQuick Ionosphere model if the GPS Klobuchar Navigation Parameters are automatically generated . This can lead up to 15 meters of height error in the simulated position if NeQuick model is selected instead of Klobuchar.
- SMBV-K360 eraGlonass Test Suite:
  - Test case 5.13 rates 5 Hz and 10 Hz not supported (only 1 Hz and 2 Hz)
  - If the test case duration is made too short (less than the time to reach a 3D fix), the test case yields with a pass.

1.3 Version 3.50.082.35.1

Released: January 2017

Fixed Issues

- SMBV-K80 BERT did not work with SMBV-B51.

1.4 Version 3.50.082.35

Released: August 2016

New Functionality

- SMBV-K80 – Bit Error Rate Tester (BERT)
- SMBV-K113 – EUTRA/LTE Release 12
- SMBV-K308 – Direction Finding
- Support of new power sensors NRP8S, NRP18S, NRP33S, NRP40S, NRP50S, NRP6A, NRP18A, NRP18T, NRP33T, NRP40T, NRP50T, NRP67T and NRP110T
- New remote control emulations AF3413 and AF3416
- Remote control emulation AF205x: Added option 006 (Avionics)

Fixed Issues

- The baseband menue opened, if the level modification in the headpanel was completed by pressing the x1 key.
- The parameter Analog IQ Output Type could not be set to differential.
- All digital standards: The firmware crashes, if the Save/Recall button was pressed followed by the ESC key.
- ARB: If a HD Radio waveform is selected, the parameter Clock Frequency was overwritten with two new parameters.
- ARB: The options SMBV-K300 and SMBV-K301 were not shown in the waveform info
- AWGN: The group 'Noise Power Configuration and Output Results' showed only three parameters. If parameter 'Display Mode' was toggled from RF to Baseband and back to RF, all parameters were visible.
- Pulse Modulation: If no pulsed signal was supplied to the PULSE EXT input, the SMBV did not output a signal at the RF output.
- User Correction: After a restart of the instrument, the user correction was indicated as active, but the user correction was not active.

Known Issues

- Absolute Power issue with DVB when toggling the digital standard state without toggling afterwards the RF state. Similar but minor issues are observed with other digital standards
- Rarely the connection on the Digital Interface cannot be established in the SMBV. This is usually solved by reconnecting and checking the connection state in the SMBV
- XM-Radio: The physical layer mode Terrestrial A and Terrestrial B does not work.
- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can’t be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.
- WLANn: external clock not working correctly

GNSS

New Features

- Changes in device Level (equivalently sum power) are now reflected in the Ref. Power inside the satellite configuration dialog along with the power view of the S.P.O.T.
- Added support for elevation Mask types: Earth Tangent & Local Horizon
- Added high altitude support for the simulated location up to 50000 Km

- Added a directed transmit Antenna capability for simulated SVs, by muting side lobes with a user defined angle.
- Changed the behavior of elevation mask such that satellites below the mask are now masked in all modes. Previously in "User localisation mode" with "User power mode" to SV power value would override the mask, this had caused some receivers to loose the fix randomly as they do not expect these satellites.
- Added a new SCPI Command for the HiL latency statistics.
- Added support of the SBAS system GAGAN for the Indian region
- Implemented a Rohde&Schwarz proprietary file format for the acquisition assistance files. This format uses the absolute time in the GLONASS standard time basis
- Added Predefined BeiDou Scenarios for A-GNSS TS LBS
- Added SCPI commands return the Receiver's Velocity
- Added Perturbation and Error Modeling support for Galileo
- Antenna position offset from the center of gravity is now simulated. Previous releases supported only the rotations.

Fixed Issues

- Fixed an issue which may cause a delay between the power level set in the GUI and the one simulated in the signal.
- Fixed an issue causing the SV configuration button to be missing for certain SW option configuration.
- Fixed an issue for waypoint files with a duration above of 15 hours
- Fixed an issue which could cause GLONASS simulations to stop.
- Fixed an issue causing plotting of the Klobuchar Ionospheric corrections not to work properly.
- Improved handling of not saved Antenna Pattern files.
- Fixed satellite visibility issue for the LMM simulation.
- Fixed an issue which may not allow the SCPI "<subsystem>:SVID<ch>:GPS:NMESsage:PROJect" to work properly.
- Improved the floating point precision of returned receiver position values in SCPI commands
- Added sanity check on the HiL Attitude change rates to limit these below 400 Hz
- Improved the responsiveness of the Map and Attitude S.P.O.T views in HiL.
- Resolved an issue where the Trigger may not work in some configurations.
- Fixed an issue which may not trigger the restarting of the simulation in case of change of not real time parameters like Yaw, Pitch and Roll
- Fixed an issue which could cause DSP errors on SMBV old board for simulations of several days.

- Resolved problem with the SSID in GBAS. Only the even numbers were used for the SSID

Known Issues

- The Almanac Projection of GLONASS is not realized. It is recommended to choose an Almanac for the same simulated week.
- Pseudo-Range biases are logged one second later respect to the time of applicability written in the correction file for SBAS
- GNSS signal distorted when fetched from the SMBV DIG-OUT.
- Real-Time User changes of Satellite State or Power are displayed in the S.P.O.T view with a latency of 5 seconds. This does not affect the generated RF signal.

Avionics

Modified Functionality

- ILS / VOR: An empty COM ID code will now generate a continuous COM ID carrier
- ILS / VOR: Changed leveling concept for ILS signals. Power level is now based on carrier level and not RMS value of the sum signal.
- DME: Added an optional pulse pair spacing tolerance option for DME pulses. Pulses outside this tolerance are not recognized as valid interrogator or reply pulses.

Fixed Issues

- ILS / VOR: Fixed clipping issue, when increasing the envelope of the sum signal in real time (e.g. increased modulation index)
- DME: Fixed bug in DME distance delay settings. Distance calculation was wrong for values greater th
- DME: Fixed bug where the squitter pulse rate was dependant on the range distance.

Known Issues

- ILS / VOR: Realtime parameter changes caused a 40us discontinuity in the RF signal.

LTE

Compatibility

- All supported features are in line with 3GPP release 12, i.e. the following official 3GPP specifications are implemented: TS36.211 v. 12.7.0, TS36.212 v. 12.6.0, TS36.213 v. 12.7.0. This version is compatible with Rohde & Schwarz EUTRA/LTE Analysis Software Version 3.4 SP1 (FSx-K100/-K101/-K102/-K103/-K104/-K105).

New Features

- **General**
  - First version to support the LTE options K113 and K413 (EUTRA/LTE Release 12).
- **Downlink**
  - Downlink carrier aggregation with mixed TDD uplink/downlink configuration or special subframe configuration, according to release 11.
  - Downlink carrier aggregation with mixed duplexing, according to release 12.
  - Configuration of the MIB spare bits is possible now.
  - More flexibility for configuring the cell specific antenna port for a specific physical antenna.
  - Configuration of associated uplink carriers in case of downlink carrier aggregation.
  - Support for DCI format 1C with eIMTA-RNTI.
  - 256QAM modulation for PDSCH and PMCH.
  - New 256QAM test models (E-TMs) of 3GPP TS 36.141.
  - RLC counter for PDSCH scheduling mode "Auto Sequence".
- **Uplink**
  - Aperiodic SRS (SRS trigger type 1).
  - Support of release 12 mixed duplexing configurations in uplink carrier aggregation.
  - Support of release 11 mixed TDD UL/DL configurations in uplink carrier aggregation.

Modified Functionality

- **General**
  - Harmonized the SCPI commands for different antenna port tables.
  - Improved the UI behavior when setting cell indices in downlink or uplink carrier aggregation tables.
- **Downlink**
  - In mode "SISO+BF" it is now possible to switch off antenna port 0 on individual baseband outputs.
- **Uplink**
  - A configured SFN offset is visualized in the time plan.
  - In case of uplink carrier aggregation, UE mode PRACH is not allowed.

Fixed Issues

- **General**
  - Minor fixes in the user interface.
- **Downlink**
  - Bugfix for conflicting PDSCH and CSI-RS allocations.
  - The DCI coding of the Downlink Assignment Index (DAI) was incorrect in case of MBSFN.
  - When using E-TMs on more than one component carrier, the PDCCH settings on the SCells were different from the PCell.
  - Overlapping resource allocations were not possible for MU-MIMO with beamforming users.
  - Bugfixes for PDSCH scheduling mode "Auto Sequence".
  - User interface and remote control bugfixes and improvements in the AP table.
  - Fixes for downlink carrier scheduling in case of PDSCH scheduling mode "AutoDci".
  - User interface fixes for PDSCH enhanced config in case of "user" PDSCH.
  - User interface fixes for cases with user specific antenna port PDSCH (beamforming).
- **Uplink**
  - Configuring the enhanced channel settings was not possible for some subframe configurations.
  - PUCCH allocation conflicts as well as some read only PUCCH information were not displayed correctly in the user interface.
  - Fixes for FRCs in case of uplink carrier aggregation.

Known Issues

- **General**
  - Improved On/Off ratio for TDD is not supported in combination with "Best ACP" or "Auto" filter optimization types.
- **Downlink**
  - "Autofill" feature for PDSCH scheduling mode "Auto Sequence" is not yet available for TDD duplexing mode.

1.5 Version 3.20.281.28.7

Released: November 2015

New Functionality

- Custom Digital Modulation: Support of low symbol rates down to 50 Hz with internal clock.

Known Issues

- Absolute Power issue with DVB when toggling the digital standard state without toggling afterwards the RF state. Similar but minor issues are observed with other digital standards
- Rarely the connection on the Digital Interface cannot be established in the SMBV. This is usually solved by reconnecting and checking the connection state in the SMBV
- XM-Radio: The physical layer mode Terrestrial A and Terrestrial B does not work.
- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can't be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

GNSS

Fixed Issues

- Solved issue of invalid Almanac Data when "Time Projection of Navigation Data" is activated. This applies to GPS, Galileo, BeiDou and QZSS.
- Solved issue where Atmospheric and Pseudo-range Biases are not simulated for exchanged SVs in the case of Auto Localization mode. This improves 3D fix accuracy for long simulations.
- Fixed GUI issue where some dialogs (such Global Power Configuration) would not be present if K-92 option is missing.
- Fixed issue where Automatic Power Mode would lead to wrong inter system power calculation in some cases.
- Fixed issue where invisible SVs would not be masked in the Automatic Power Mode.
- Solved a timing issue where the time difference between the signal and the1PPS Marker would be delayed if more than 19 SV are modeled.
- Improved the UTC parameters initialization to be up to date with the simulation time.
- Fixed an issue in the attenuation model for the multipath simulations. This improves the performance of the ground sea reflections and other Multipath scenarios with automatic power loss calculation based on the reflecting material.

- Solved an issue for BeiDou GEO (SV-ID 1 -- 5) and Galileo SVs which guaranties the continuity of simulations at ephemeris page updates including week transitions.
- Solved an issue that caused GLONASS signal to be interrupted in long simulations in some cases.
- Solved an issue where the SCPI command for querying receiver attitude returns the wrong order of angles (Roll Pitch Yaw instead of Yaw Pitch Roll).
- Solved an issue in aborting the previous simulation if a simulation parameter changes.
- Improved the logging by removing rounding issues and cases where velocity was not logged.
- Solved an issue which occurs when combining BeiDou and Galileo with Multipath Scenarios.
- Solved an issue where Galileo does not give a 3D fix in User Localization when importing a RINEX file.
- Improved the ephemeris and clock error simulation in cases where multiple SBAS systems are simultaneously enabled.
- Corrected inconsistencies in the default BeiDou RINEX file. This improves the SV position of the IGSOs with PRN 8 and 10.

Known Issues

- The Almanac Projection of GLONASS is not realized.
- External trigger does not work if the external trigger mode was selected while the simulation is running. If the simulation is restarted the issue is masked.
- Pseudo-Range biases are logged one second later respect to the time of applicability written in the correction file for SBAS.
- GNSS signal distorted when fetched from the SMBV DIG-OUT.
- GLONASS Auto localization results in wrong SV positions, hence no fix, when the chosen start simulation time is far away from the GLONASS Almanac time of applicability. It is recommended to choose an Almanac for the same week.
- Real-Time User changes of Satellite State or Power and Hardware in the Loop (HiL) receiver location and attitude are displayed in the S.P.O.T view with a latency of 5 seconds. This does not affect the generated RF signal.

Avionics

Fixed Issues

- Solved issues where Uncritical Modulation Errors occur when aborting the simulation In Multiple Frequency Mode.
- Fixed an issue where negative GBAS differential values may be simulated as zero.
- Fixed an issue in the EVM of Single Frequency Mode due to unwanted signal clipping.

Known Issues

- The EVM for multiple frequency mode is high (bigger than 10%).

1.6 Version 3.20.281.28.3

Released: October 2015

Fixed Issues

- The GPIB address did not save during a reboot.
- Asynchronous Bypass Mode for Pulse Modulation did not work.

Known Issues

- Absolute Power issue with DVB when toggling the digital standard state without toggling afterwards the RF state. Similar but minor issues are observed with other digital standards
- Rarely the connection on the Digital Interface cannot be established in the SMBV. This is usually solved by reconnecting and checking the connection state in the SMBV
- XM-Radio: The physical layer mode Terrestrial A and Terrestrial B does not work.
- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can't be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

1.7 Version 3.20.281.28

Released: August 2015

New Functionality

- SMBV-K110 (SBAS) including WAAS, EGNOS and MSAS. Ranging, differential GNSS with High Accuracy, Integrity as well as Avionics Localizer Performance with Vertical Guidance (LPV) applications are supported.
- SMBV-K112 (LTE Release 11 and enhancements)
- Avionics
  - On the Fly parameter update of ILS, VOR, DME
  - Allowing switching off Morse Coding through the configuration of empty "IDENT" string

- DME “Range Distance” also configurable in micro-seconds and not only NM
- VOR Accuracy of the SMBV is significantly improved
- GBAS Application Data Length (Bytes) made configurable when working in PN/Pattern/Data List Mode
- GBAS Sample Rate Variation made configurable between 10.49 and 10.51 KHz
- Support of the configuration of the GBAS Message 1 Parameters “SPR”, “B1”, “B2”, “B3”, “B4”, “Available Duration” and “Decorr. P” through XML.

Fixed Issues

- Control lists (:BB:DM:CLIS:DATA) do not work if exceeding 100000 bytes
- USB remote control not working with old processor board
- GNSS: short power dropouts when changing the satellite power in realtime-mode
- NRP-Z level control shows timeout
- Frequency offset not working
- Internal adjusment: In rare cases the IQ Adjusment fails
- External level adjustment fails
- Several bugs with ARB / multi segment
- RF signal shortly blanked (up to 10 ms) with any on the fly change in the digital standard configuration i.e. without signal recalculation
- Master / Slave mode synchronization failures with specific configurations
- DIG-IN with Source “Digital I/Q IN” may estimate the wrong sample rate
- The constellation is 90° rotated for SMBVs with ARB only Board (SMBV-B51)
- Error in the absolute power for SMBVs with ARB only Board (SMBV-B51)
- Custom Dig. Mod. Symbol Rate maximum selected value limited to 18.5 MHz instead of 50 MHz with OQPSK Modulation Type
- GBAS gated power mode buggy; power measurement is not aligned to the standard field

Known Issues

- Absolute Power issue with DVB when toggling the digital standard state without toggling afterwards the RF state. Similar but minor issues are observed with other digital standards
- Rarely the connection on the Digital Interface cannot be established in the SMBV. This is usually solved by reconnecting and checking the connection state in the SMBV
- XM-Radio: The physical layer mode Terrestrial A and Terrestrial B does not work.

- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can't be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

GNSS

New Features

- Support of GNSS Logging of Satellite and Receiver Information in Real-Time and Prediction Offline Mode
- GPS and Glonass Perturbation & Error Modelling through SBAS XML Files allowing the simulation of user wanted Pseudorange profiles. Pseudorange Ramping is made available
- Simulation of BeiDou B2I following BDS-SIS-ICD-2.0 -- 12/2013
- Support of the Russian PZ90.11 coordinate system
- Simulation of Land Mobile Multipath (LMM) based on real life sounding statistics
- Simulation of the Nequick Ionospheric model as well as other atmospheric models according to MOPS DO. 229D
- Automatic Fitting of ionospheric navigation parameters from the simulated ionospheric model for realistic simulation
- 15 dB configurable Dynamic Range instead of 10 for Additional Tap Power with Static Multipath

Fixed Issues

- Solved an issue in the total power which used to result in one or more of the following:
  - Error messages "value out of range" in case the satellite number is changed from 12 to 4 and back to 12 again in user power mode.
  - Wrong signal power up to 7 dB from what is being simulated.
  - Error message "zero measured output signal" on some machines when turning GPS standard with default settings.
- Solved issue of Code phase initialization in static mode and with P-Code that was sporadically causing one chip delay.
- Solved issue where Signal Alignment to Trigger used to vary in multiple runs, if P-Code is selected in GNSS System Configuration.
- Solved issue in Galileo CBOC(6,1) pulse shaping that was shifted by 16.67 ns (13386): this problem was present only if P-Code or Galileo but not BeiDou is selected in GNSS System configuration.

- Solved issue in GLONASS where the signal was shifted by 16.67 ns relative to other GNSS systems (13385): this problem was present only if P-Code or Galileo but not BeiDou is selected in GNSS System configuration.
- Solved an issue of signal chip transition jitter of 16.67 ns.
- Solved an issue resulting in a “zero signals measured no output signal from baseband" which used to occur when turning on the GNSS standard after setting the BBin to ON and then OFF.
- Solved an issue in “Leap Second” simulation that cause the leap to happen on a wrong day of the week.
- Solved an issue causing the RF output to be masked when changing a real-time parameter (SV state, SV power, SV pseudo-range bias).
- Fixed an issue in Antenna Attitude rotation causing misinterpretation of the Body mask azimuth by "simulated real Az" = Pi/2 - "real Az" (13561).
- Improved the stability in the Waypoint file parsing. This solved an issue that happens when the last line in the NMEA file is incomplete. Another waypoint parsing issue that causes the simulation to stop after long time (more than 5 hours) is also solved.
- Solved an issue that happened when starting the simulation with all the satellites turned OFF.
- Solved an issue where QZSS SVs were wrongly simulated. The issue used to happen only if BeiDou is used as entry point of the simulation.
- Solved an issue in Map View in the Real-Time S.P.O.T where the reference location was not initialized to the location at simulation start.
- Solved an issue in the BeiDou navigation message where the week number could be simulated wrongly in some cases.
- Solved an issue in the Waypoint smoothening algorithm to improve stability for cases with small number of Waypoints.
- Solved an issue for Galileo that causes the Ephemeris and Almanac IOD parameter not to be updated.
- Solved inconsistencies in the almanac navigation message parsing of GPS.

Known Issues

- Invalid Almanac Navigation Data when "Time Projection of Navigation Data" is activated. This applies to GPS, Galileo, BeiDou and QZSS. Moreover, the Auto Localization mode is always affected since Time Projection is forced to On.
- Atmospheric and Pseudo-range Biases are not simulated for exchanged SVs in the case of Auto Localization mode. This means that as of the first handover the fix accuracy can be affected.
- Automatic power mode would lead to wrong inter system power calculation. Precisely, this affects only the power for SVs from a GNSS system other than the system used as reference for the power calculation. Example: if ref. Standard is Galileo, the automatic power for a GPS SV is wrong.

- BeiDou and Galileo in system Configuration, with close to maximum channels configuration with obscuration & Multipath ON. Problem may occur
- BeiDou GEO (SV-ID 1 -- 5) and Galileo cannot not be used for localization after week transition. Moreover, the simulated week number corresponding to the start of the simulation should be the same as the week number of the loaded almanac file.
- Galileo does not give a 3D fix in User Localization when importing a RINEX file.
- GNSS signal distorted when fetched from the SMBV DIG-OUT.
- Pseudo-Range biases are logged one second later respect to the time of applicability written in the correction file for SBAS.
- Satellite velocity is rarely not logged.
- The Almanac Projection of GLONASS is not realized.
- The simulation time in the real-time S.P.O.T is not displayed correctly but the generated signal simulates the leap second correctly however.
- The SCPI command for querying receiver attitude returns the wrong order of angles (Roll Pitch Yaw instead of Yaw Pitch Roll).
- External trigger does not work if the external trigger mode was selected while the simulation is running. If the simulation is restarted the issue is masked.

LTE

Compatibility

- All supported features are in line with 3GPP Release 11, i.e. the following official 3GPP specifications are implemented: TS36.211 v. 11.6.0, TS36.212 v. 11.5.1, TS36.213 v. 11.8.0.
- This version is compatible with Rohde & Schwarz EUTRA/LTE Analysis Software Version 3.4 SP1 (FSx-K100/-K101/-K102/-K103/-K104/K105).

New Features

- **General**
  - New marker type "SFN restart period".
  - First version to support the LTE options K112 and K412 (LTE Release 11 and enhanced features).
  - New release 11 special subframe configurations 9 (for normal cyclic prefix) and 7 (for extended cyclic prefix).
- **Downlink**
  - New PDSCH scheduling mode "Auto Sequence".
- **Uplink**

- Extended PUCCH format 3 according to release 11.
- Uplink Carrier Aggregation.

Modified Functionality

- **General**
  - Some filter improvements for special cases with carrier aggregation or high FFT size.
  - Filter optimization type "Balanced EVM and ACP" is not supported anymore.
- **Downlink**
  - Downlink time plan cell selection is now done by means of the cell number instead of the cell index
  - Increased the maximum number of entries of the PDCCH DCI table.
  - Removed the reserved "RSVD" channel type.
  - Individual users can be switched off now.
- **Uplink**
  - Increased the maximum possible number of PUSCH CQI bits to 1024.
  - UE release selection "Release 10" was renamed to "LTE-Advanced".

Fixed Issues

- **General**
  - Carrier aggregation frequency offset did not work in case of only one activated carrier.
  - Fixes for carrier aggregation with different channel bandwidths on different carriers.
  - Minor fixes in the user interface.
  - Test case wizard: Bugfix for wanted signal level in test case 7.4 (only medium range BS class).
- **Downlink**
  - "RS power per RE relative to level display" was sometimes 0 dB.
  - "RS power per RE relative to level display" was sometimes wrong for carrier aggregation cases.
  - Allocation conflict was shown when two beamforming users shared the same frequency resources.
  - Bugfix for DCI format 3 bit coding.
  - For cases with more than two transmission layers and UE specific reference symbols, the leveling of the reference signals against the PDSCH was wrong.
  - In PDSCH mode "Auto DCI", the transport block size was derived wrongly from the MCS in some multi-layer cases.

- **Uplink**
  - The coding of PUSCH RI bits was wrong in case more than 11 RI bits were configured.

Known Issues

- **General**
  - Improved On/Off ratio for TDD is not supported in combination with "Best ACP" or "Auto" filter optimization types.
- **Downlink**
  - "Autofill" feature for PDSCH scheduling mode "Auto Sequence" is not yet available for TDD duplexing mode.

1.8 Version 3.20.012.109.7

Released: April 2015

Known Issues

- XM-Radio: The physical layer mode Terrestrial A and Terrestrial B does not work.
- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can't be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

GNSS

Fixed Issues

- Error message "**Zero Measured Output Signal**" in case of GPS default settings occurs, and the base band output signal is stopped due to a FPGA timing error (PR 14192).
- SCPI command sequence is very slow on SMBV new board respect to an SMBV old board (PR 14714).

Known Issues

- Signal Alignment to Trigger may vary in multiple runs, if P-Code is selected in GNSS System Configuration (13597)
- Real time error if the start simulation time is in the last 6 s before a week transition with GPS (13387).
- Inconsistencies in the almanac navigation message parsing of GPS (13383).
- GNSS signal distorted when fetched from the SMBV DIG-OUT (13384).

- Glonass signal shifted by 16.67 ns relative to other GNSS systems (13385): this problem is present only if P-Code or Galileo but not BeiDou is selected in GNSS System configuration.
- Galileo CBOC(6,1) pulse shaping shifted by 16.67 ns (13386): this problem is present only if P-Code or Galileo but not BeiDou is selected in GNSS System configuration.
- Code phase initialization in static mode and with P-Code is sporadically causing one chip delay.
- Antenna Attitude rotation bug causing misinterpretation of the Body mask azimuth by "simulated real Az" = Pi/2 - "real Az" (13561).

1.9 Version 3.20.012.109.5

Released: February 2015

New Functionality

- SMBV-K300, Pulse Sequencing
- SMBV-K301, Enhanced Pulse Sequencing
- SMBV-K350, DFS Signal Generation
- Support of new power sensors NRP8S, NRP18S and NRP33S

Fixed Issues

- Custom Digital Modulation: The firmware crashed, if modulation type was OQPSK and a user filter was selected (13909).
- FM Stereo: The SCPI command SOUR:BB:STER:GPRS:CMNS:PI did not work (13917, 14286)
- FM Stereo: The firmware crashed after some minutes, if the dialog Extended Configuration of the RDS/RBDS Groups Message Settings was open (13765).
- ARB: In some cases the error “Syntax error” did appear while executing the SCPI command SOUR:ARB:WAV:DATA? (13736).
- NRP-Z Level Control: The firmware did hang, if the dialog was be open (14270).

Known Issues

- XM-Radio: The physical layer mode Terrestrial A and Terrestrial B does not work.
- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can’t be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

GNSS

New Features

- SCAT-I feature in GBAS

Fixed Issues

- The wrong ephemeris page may have been selected with Glonass when having multiple ephemeris pages (13607).
- SMBV got stuck when loading NMEA Waypoint files which did not have the GPGGA or GPRMC messages (13703).
- FIFO underrun may have occurred when turning ON and OFF Galileo satellites on the fly while the simulation was running (13698).
- In user localization, the range for the Relative Sat Power, was from 0 until -41 dB instead of the correct range of -21 dB (13751).
- Positive velocity setting in signal dynamics was showing a negative velocity by the receiver. This was due to a wrong conversion between Doppler and velocity, this was present in all Doppler profiles (13752).
- The SMBV crashed after changing the unit from Hz to m/s in signal dynamics use case of constant Doppler, and by closing the signal dynamics window and re-opening it again (13753).

Known Issues

- Signal Alignment to Trigger may vary in multiple runs, if P-Code is selected in GNSS System Configuration (13597)
- Real time error if the start simulation time is in the last 6 s before a week transition with GPS (13387).
- Inconsistencies in the almanac navigation message parsing of GPS (13383).
- GNSS signal distorted when fetched from the SMBV DIG-OUT (13384).
- Glonass signal shifted by 16.67 ns relative to other GNSS systems (13385): this problem is present only if P-Code or Galileo but not BeiDou is selected in GNSS System configuration.
- Galileo CBOC(6,1) pulse shaping shifted by 16.67 ns (13386): this problem is present only if P-Code or Galileo but not BeiDou is selected in GNSS System configuration.
- Code phase initialization in static mode and with P-Code is sporadically causing one chip delay.
- Antenna Attitude rotation bug causing misinterpretation of the Body mask azimuth by "simulated real Az" = Pi/2 - "real Az" (13561).

1.10 Version 3.20.012.109.1

Released: November 2014

New Functionality

- SMBV-K151, ILS
- SMBV-K152, VOR
- SMBV-K153, DME
- ARB: The trigger delay for external trigger could be specified in seconds.
- Access to network shares (file servers) supported (Save/Recall --> File Manager)
- RAM disc for user data (/var/volatile). All data are stored in /var/volatile will be lost, if the instrument is rebooted.

Modified Functionality

- NRP-Z Powerviewer: The measured level is displayed larger

Fixed Issues

- 3GPP-FDD: The filter type "Gauss (Pure)" was not remote configurable. (13367)
- 3GPP-FDD Uplink: In case of HS-DPCCH slot format 1, transmissions could happen in the wrong slots of the very first radio frame. (13541)
- General: In rare cases the error message “No hard disc found! Operation of digital standards / ARB is limited!” appears, although a SMBV-B92 is installed
- FM Stereo: The SCPI command :BB:STEReo:GPRS:GTO:ALTF:NOEN does not work (13758)
- Remote emulation E4438C: The command POWer/POWer:OFFSet delivers a wrong setting (13369)
- GBAS: The error message “*Modulation coder;Uncritical modulation coder error, General uncritical error: Zero signal detected in file '/hdd/Unicod/GbasKernelLog1.ibn'. No output signal from baseband. [CListManager::ConvertWinIQSimIBNFileToARBFile()]*” appears if the state is switched on in default state.

Known Issues

- XM-Radio: The physical layer mode Terrestrial A and Terrestrial B does not work.
- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can’t be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

GNSS

New Features

- Almanac Projection

Fixed Issues

- There was no Fix after the week roll over (13545)
- Af0 could blow using a start simulation timer after 2019 with an almanac older than 2012. Almanac projection was not implemented and this max lead to big residuals (13269)

Known Issues

- The wrong ephemeris page may be selected with Glonass when having multiple ephemeris pages (13607)
  SMBV gets stuck when loading NMEA Waypoint files which do not have the GPGGA or GPRMC messages (13703)
- Signal Alignment to Trigger may vary in multiple runs, if P-Code is selected in GNSS System Configuration (13597)
- FIFO underrun may occur when turning ON and OFF Galileo satellites on the fly while the simulation is running (13698)

LTE

Compatibility

- All supported features are in line with 3GPP Release 10, i.e. the following official 3GPP specifications are implemented: TS36.211 v. 10.6.0, TS36.212 v. 10.7.0, TS36.213 v. 10.8.0.
- This version is compatible with Rohde & Schwarz EUTRA/LTE Analysis Software Version 3.4 SP1 (FSx-K100/-K101/-K102/-K103/-K104/K105)..
- SAVE/RECALL is only supported for FW versions from version 2.15.085.78 on, i.e. RECALL of settings files generated with older FW versions is not supported.

New Features

- Longer PUSCH RI and CQI patterns are possible now. (13309)

Modified Functionality

- Changed the PRACH skipping of root Zadoof-Chu sequences according to the 3GPP clarification R1-133569. (13467)

Fixed Issues

- Various fixes for PDSCH scheduling mode "Auto-DCI" and for the DCI table. (13697)
- Bugfix for the user specific antenna port mapping in case of four-antenna-beamforming. (13322)
- The MCCH allocation value was displayed incorrectly. (13354)
- The PBCH power was reset after configuring DCIs in PDSCH scheduling mode "Auto-DCI". (13478)
- Wrong precoding codebooks were used in case the simulated antenna was not "Antenna 1". (13567)
- Bugfix for PRACH restricted set.

Known Issues

- Improved On/Off ratio for TDD is not supported in combination with “ACP-optimized” filter.

1.11 Version 3.20.012.55.1

Released: July 2014

New Functionality

- SMBV-K105, QZSS

Modified Functionality

- 3GPP-FDD, Uplink PRACH/PCPCH: Repetition periods other than the ARB sequence length are possible.
- IEEE 802.11 WLAN: The resolution of the parameter Idle Time in the frame configuration is increased to from 1µs to 0.1µs.
- Help: The table of context could be turn off or turn on with the button “Hide Toc” or “Show Toc”

Fixed Issues

3GPP-FDD: User Scheduling shows false warnings about misplaced DPDCH, E-DCH and power control commands although these are not present in the User Scheduling file.	12869
3GPP-FDD: When selecting an uplink test model, a warning "value out of range" was shown. The signal was correct anyhow.	12395
3GPP-FDD: When selecting a downlink test model, the OCNS channels have not been switched off.	11871
GNSS: Satellites disappear during ephemeris update	11999
GNSS: Error message “Unable to load file”	12819
IEEE 802.11 WLAN: The parameter Idle Time of the frame configuration could not be set in ms via remote control.	12698
ARB MultiSegment: The firmware crashes if a blank segment is inserted in a multi segement list	12341
ARB Multi Carrier: Gain cannot be changed, if the Carrier Frequency is set to 27.3 MHz	10375
Custom Digital Modulation: The firmware crashes, if the filter APCO25(LSM) is selected	12964
Sirius: The SCPI commands [:SOURce<hw>]:BB:SIRius:DATA:HDDStreaming:BLEVel? and [:SOURce<hw>]:BB:SIRius:DATA:HDDStreaming:STATe <State> does not work.	12404
File Manager: Copy and paste of directories does not work	13071
Option SMBV-K407 does not appear in the menu Software Options	12410
EUTRA/LTE: The firmware crashes, if the enhanced settings config dialog in the frame configuration table is open	13155
IQ Analog Ouput Settings: The SCPI command IQ:OUTP.POW:PEP doesn’t work	13036

IQ Analog Outputs Settings: Digital attenuation does not work correct.	11965

Known Issues

- XM-Radio: The physical layer mode Terrestrial A and Terrestrial B doesn't work.
- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can't be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

GNSS

New Features

- GNSS pseudorange precision improvement to typically less than 50 cm
- Antenna pattern editor in the firmware
- Additional SPOT displays (Attitude view)
- Ref. Power as a Real Time parameter

Fixed Issues

- GPS and BeiDou satellites are invisible for short time after ephemeris update (11999)
- BeiDou GEO satellites (SV-IDs 1-5) are not included in the fix after a week transition from the initial simulation week happens (12360)
- Simulated BeiDou IGSO satellites using the default almanac file are a bit distanced from the real positions (12360)
- Simulating two or more GNSS systems in the same SMBV100A with more than a total of 12 satellites e.g. GPS and BeiDou and with Automatic Multipath activated in the modeled user environment (K101, K96) may cause sporadic errors in the GNSS simulation (12360)
- Simulating a Galileo satellite constellation with Automatic Multipath activated in the modeled user environment (K101) may cause sporadic errors in the GNSS simulation (12360)
- Klobuchar ionospheric model buggy when simulating satellites at negative elevation
- When running 24 Galileo satellites with Auto Localization a critical mdulation error was showing up at the beginning which was related to the budget (turning off 5 satellites).
- Leap Second Transition with GPS; Day Number representing the transition is wrong by one day
- Leap Second not loaded from Rinex with hybrid GPS, Glonass constellations
- BeiDou almanac file not totally representing the actual BeiDou satellite orbits
- GNSS URA/SISA parameter not loaded and written correctly from/to a Rinex file
- 24 Galileo satellites with Auto Localization shows a critical mdulation error when Baseband state turned ON
- Sporadic real time error with only "obscuration" models and 24 selected satellites

- Week rollover simulation e.g. GPS every 1024 weeks starting 6 January 1980 is erroneous
- SOUR:BB:GPS:RT:HILPosition:LATency? returns wrong values in the case of negative latencies (12360)

Known Issues

- Real time error if the start simulation time is in the last 6 s before a week transition with GPS
- Inconsistencies in the almanac navigation message parsing of GPS
- GNSS signal distorted when fetched from the SMBV DIG-OUT
- Glonass signal shifted by 16.67 ns relative to other GNSS systems
- Galileo CBOC(6,1) pulse shaping shifted by 16.67 ns
- Code phase initialization in static mode and with P-Code is sporadically causing one chip delay
- Antenna Attitude rotation bug causing misinterpratation of the Body mask azimuth by "simulated real Az" = Pi/2 - "real Az"

LTE

Compatibility

- All supported features are in line with 3GPP Release 10, i.e. the following official 3GPP specifications are implemented: TS36.211 v. 10.6.0, TS36.212 v. 10.7.0, TS36.213 v. 10.8.0.
- All supported features are in line with 3GPP Release 10, i.e. the following official 3GPP specifications are implemented: TS36.211 v. 10.6.0, TS36.212 v. 10.7.0, TS36.213 v. 10.8.0.
- All supported features are in line with 3GPP Release 10, i.e. the following official 3GPP specifications are implemented: TS36.211 v. 10.6.0, TS36.212 v. 10.7.0, TS36.213 v. 10.8.0.

New Features

- OCC for PUSCH, possibility to switch off OCC in case of single antenna port transmission.
- PUCCH and SRS transmission via more than one antenna port.
- Spatial multiplexing for PUSCH (Uplink MIMO, Uplink Transmission Mode 2).

Modified Functionality

- The maximum possible number of downlink subframe table allocations was reduced for high bandwidth cases.
- Unused downlink allocations are not shown in the subframe configuration table anymore.
- Non-standard values for n(2)_DMRS are not supported anymore.

Fixed Issues

- In the test case wizard, some frequency input fields behaved strange (user interface only).
- Marker rise/fall offsets did not work for marker type "Frame Active Marker".
- The remote control command BB:EUTRa:CLOCk:MODE SAMPle did not work. (12458)
- DCI Format 1A: Mode PRACH was not selectable.
- DCI formats 2, 2A: An active "Transport Block to Code Word Swap Flag" caused an undefined behaviour in cases of only one transport block.
- DCI parameter "SRS Request" was missing for some DCI formats. (13233)
- Downlink channels with state OFF could cause a scheduling conflict in the subframe configuration table.
- Fixes for Downlink Antenna Port Mapping.
- Fixes for Scheduling Mode "Auto-DCI".
- In unused MBSFN subframes, the control region for PDCCH was configurable by mistake.
- On recalling a setup file with a P_A value different from default, the PDSCH power was not corrected accordingly. (13209)
- The firmware crashed on entering the enhanced PBCH settings dialog if the option K85 was not available. (13155)
- The number of PHICH groups was not determined correctly in Auto DCI mode.

- The PBCH data source was not used correctly in case of Scheduling Mode "Auto-DCI".
- The PDCCH could not be switched off properly in individual subframes in case of Scheduling Mode "Auto-DCI". (13227)
- The PDSCH power was not determined correctly in Scheduling Mode "Auto-DCI" in case of 4 Tx Diversity.
- The value range of the "SRS Request" field in the DCI configuration was wrong.
- Correction of FRC A.2.2.2.2 of TS 36.521.
- Correction of the channel coding of PUSCH HARQ ACK information in case more the 11 bits are coded.
- PUSCH mode UCI-only: The number of coded RI bits was determined incorrectly.
- RI coding on PUSCH was wrong for cases with more than 2 RI bits.
- Without available K84 option, the PRACH, PUSCH and PUCCH parameters of the "General Uplink Settings" were not visible.

1.12 Version 3.01.130.48.1

Released: April 2014

Fixed Issues

- GNSS: Leap second was not updated in the user interface when loading a Rinex File including leap seconds information in its header.
- In rare cases, the rotary knob and the front panel keys did not work, if an old base board (part number 1406.6700.02) are replaced with a new base board (part **number 1406.6900.02) in service.**

1.13 Version 3.01.130.48

Released: December 2013

New Functionality

- SMBV-K107, BeiDou
- SMBV-K111, GBAS
- SMBV-K407, BeiDou with R&S WinIQSIM2
- Support of new baseboard 4 (Partnumber 1406.6900.02)
- NRP-Z closed loop power control of RF power
- Remote control : new commands SYST:REBOOT and SYST:UPTIME?

Modified Functionality

- ARB/remote control: Improved setting times for :BB:ARB:WSEG:NEXT

- RF power/frequency changes by remote control: Setting time reduced (based on *OPC? Round trip)
- List mode: Display of current index
- NRP-Z Power Viewer now supports logging to file
- Security settings: Extended for several LAN protocols and file I/O
- NRP-Z Power Viewer with NRP-Z81/Z85: Average power is displayed by default
- NRP-Z Power Viewer: Aperture time can be set
- Remote control: Improved error messages
- ARB/multi carrier: Signal period mode „Least Common Multiple“ always available

Fixed Issues

Remote control : some minor problems with HiSlip protocol	9464
Cdma2000: clipping not working correctly	10446
Remote control : MMEM:CDIR does not always reply with default path after boot	11538
Instrument freezes when GPS is active and internal adjustments are started	11320
ARB: sine test signal – max. frequency not depending on optioning	11670
Digital modulation : download of data list files very slow	11514
Custom Digital Modulation: with FSK2/4, clock rate depending also on deviation	11135
Digital modulation : download of data list files very slow	11514
User correction / list mode : editor shows some strange effects	9888, 9787
GPS: setting the vehicle type to spacecraft w/o B10F option leads to infinite loop	11765

Known Issues

GPS : satellites are invisible for short time after ephemeris update (after 2 hours)	11999
Custom Digital Modulation : Misalignement between CList and DList when using single trigger	12090
Master/Slave Sync with internal trigger with different baseband standards not working automatically	12110
BeiDou GEO satellites (SV-IDs 1-5) are not included in the fix after a week transition from the initial simulation week happens	12360
Simulated BeiDou IGSO satellites using the default almanac file are a bit distanced from the real positions	12360
SOUR:BB:GPS:RT:HILPosition:LATency? returns wrong values only in the case of negative latencies	12360
Simulating two or more GNSS systems in the same SMBV100A with more than a total of 12 satellites e.g. GPS and BeiDou and with *Automatic Multipath activated* in the modeled user environment (K101, K96) may cause sporadic errors in the GNSS	12360

simulation	
SOUR:BB:GPS:RT:HILPosition:LATency? returns wrong values only in the case of negative latencies	12360
Simulating a Galileo satellite constellation with *Automatic Multipath activated* in the modeled user environment (K101) may cause sporadic errors in the GNSS simulation	12360

Changes for EUTRA/LTE

please see separate release notes SMBV_K55_K84_K85_Release_Notes.pdf

Changes for 3GPP-FDD

- Fixed Issues:
  - Signals with realtime components stopped working whenever the "Generate Waveform" functionality was used. Fixed.
  - Downlink H-Sets: The TBS index was signaled incorrectly in HS-SCCH in case of retransmissions (Mode “Always Nack”). Fixed.
  - Clipping for “Generate Waveform File” did not work. Fixed.
  - The power offset display for RRACH and PCPCH only worked for UE1 but not for UE2 to UE4. Fixed.

Changes for SMBV-K89 NFC

- New Functionality
  - Support for EMV Type A and EMV Type B
  - Predefined Sequences for EMV (Transmission Mode "PCD to PICC")
  - New Command Type "GENERIC" (only for NFC-A/B/F, only for Transmission Mode "Poll")
- Modified Functionality
  - Transmission Mode "Listen": The parameter "Desired Voltage in Unmodulated Signal Parts" is limited to 1.5 Volts now.
  - The maximum value of the parameter "Sample Rate" now depends on the device and the available options.
- Fixed Issues
  - The size of overshoots and undershoots, if configured, was sometimes wrong.
  - Command Type "SEL_RES": The platform bits have been incorrect in the "NFCID1 complete" case.

Changes for SMBV-K48/K54/K86 WLAN 802.11

- Fixed calculation of number of idle time samples (previously had rounding issues in rare cases)
- Adjusted 11p filter to meet class C and D spectrum masks
- Fixed QoS field for 11p (was not included properly before)
- Fixed issue with "configure baseband B from A" on SMU
- Reduced memory usage by skipping unused streams
- Fixed incorrect BCC tail/pad bits order for 11ac
- Fixed incorrect service field of every 2nd packet (11ac only)
- Fixed minor filtering issues on SMW
- Beacon frames:
  - Added beacon frames for 11b

  - Added HT capability IE to beacon frames (beacon frames now show up as 11n networks)
  - Fixed incorrectly encoded SSID in beacon frames
  - Removed ERP IE in 11b beacon frames
- LDPC coding:
  - Fixed buffer overrun in encoder
  - Fixed incorrect parameters calculation due to rounding issues
  - Fixed puncturing in cases where Npunc < Ncw
  - Fixed missing additional OFDM symbol due to LDPC coding

1.14 Version 2.20.360.389.1

Released: July 2013

Fixed Issues

- The Internal Adjustments hangs, if one of the GNSS standards were active with simulation mode Auto Localization.
- SMBV-K65 and SMBV-K95: A-GPS, A-Glonass and hybrid A-GPS/A-Glonass for 3GPP, 3GPP2 scenarios with moving receiver are fixed
  TS 51.010: 10.10 Performance 3
  TS 34.108: 10.1.2 Performance 3
  3GPP2 C S0036 2.1.2 Moving
  TS 37.571-1: S6 Performance 5 ST4
  TS 37.571-1: S7 Performance 5 ST1
  TS 37.571-1: S7 Performance 5 ST2
  TS 37.571-1: S7 Performance 5 ST5

Known Issues

- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can't be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

1.15 Version 2.20.360.389

Released: July 2013

New Functionality

- Support for new SMBV-B10F Baseband Generator for GNSS with high dynamic range, digital modulation (realtime) and ARB (32 Msample), 120 MHz RF bandwidth, part number 1419.2009.02
- SMBV-K67, Assisted Gallileo

- SMBV-K95, Assisted Glonass
- SMBV-K101, GNSS extension for obscuration and auto multipath simulation
- SMBV-K102, GNSS extension for antenna pattern simulation
- SMBV-K103, GNSS extension for spinning and attitude simulation
- SMBV-K92
  - Additional simulation of hardware in the loop (HIL)
  - Additional simulation of moving receiver with “*.kml” waypoint files as well as R&S proprietary “*.xtd” waypoint files”
  - Additional simulation of waypoint resampling and smoothening (filtering) based on user definable vehicle description files “*xvd”
- SMBV-K42/K43/K45/K59, 3GPP
  - Uplink: New level reference modes: First E-DCH, First HARQ-ACK, First PCI/CQI

Modified Functionality

- Custom Digital Modulation: Using burst leveling for control lists.

Fixed Issues

- SMBV-K58, Sirius: A connected receiver may not have synced to the output signal
- Custom Digital Modulation: If user filter is used, the SMBV100A may have been very slow and the firmware may have crashed after several hours.
- ARB: Max values for parameter Clock Frequency were wrong depending on the installed baseband generator options.
- Reference Oscillator: The error message “External reference oscillator out of range or disconnected” appeared, if external reference was set to 5 MHz and a valid external reference was connected.

Known Issues

- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can’t be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

1.16 Version 2.20.360.328

Released : April 2013

New Functionality

- Support of new BBGEN board with 160 MHz bandwidth (partnumber 1407.7046.02 and 1407.7046.03)
- Support of R&S SMBV-K511, ARB memory extension to 256 MSamples, requires R&S SMBV-B10 var. 04, R&S SMBV-B10F or R&S SMBV-B51 var. 04
- Support of R&S SMBV-K512, ARB memory extension to 1GSamples, requires R&S SMBV-K511
- Support of R&S SMBV-K521, Baseband extension to 120 MHz, requires R&S SMBV-B51 var. 04
- Support of R&S SMBV-K522, Baseband extension to 160 MHz, requires R&S SMBV-B10 var. 04 or R&S SMBV-K521
- SMBV-K89, NFC A/B/F
- SMBV-K289, NFC A/B/F with R&S WinIQSIM2
- SMBV-K42/K43/K45/K59, 3GPP
  - HS-DPCCH now supports HARQ and PCI/CQI for 4C-HSDPA and 8C-HSDPA
  - Uplink User Scheduling
  - PRACH Channel Coding for 10 ms TTI size
- SMBV-K54, IEEE 802.11n:
  - New marker mode “Frame Active” and “Frame Inactive”
  - New parameters “Shift Rising Edge” and “Shift Falling Edge” for marker mode “Frame Active” and “Frame Inactive”
- Security: New security setting “Write Nonvolatile Memory”.
- Remote update via LAN. For details see chapter 2.3.1.

Modified Functionality

- Settings time with *OPC? Improved.
- SMBV-K62, AWGN: The Carrier/Noise Ratio does not affect the PEP value.
- Improved stability and performance of USB-TMC

Fixed Issues

- SMBV-K40, GSM/EDGE: Different behavior by switching on GSM/EDGE state in the block diagram and in the GSM/EDGE dialog.
- SMBV-K42/K43/K45/K59, 3GPP
  - Selected data list was not displayed in downlink channel table.

- Pulse modulation:
  - The firmware crashed if pulse modulation is switched on and no SMBV-K23 (Pulse Generator) is installed.
  - In rare cases the output level differed about 1dBm
- Custom Digital Modulation: Data list played not complete, if the trigger mode is single.
- All digital modulations:
  - Data list were interpreted in a wrong way.
- ARB: The firmware crashed, if a waveform was selected on an USB device and the USB device was removed before the selected waveform is loaded.
- SCPI command ROSC:EXT:RFOF:STAT did not work.

Known Issues

- The synchronization of two SMBV100A using the master/slave setup with different baseband boards revisions (with different board revisions , e.g. 1407.7000 and 1407.7046, can be seen in Setup/System/Hardware Config) can't be done automatically. For synchronization an external calibration with an oscilloscope is required. On the other hand, when having the same baseband board revisions on the two SMBV100A automatic baseband synchronization is supported as before.

1.17 Version 2.20.360.114

Released : May 2012

New Functionality

- SMBV-K85, LTE Release 10 (Advanced)
- SMBV-K87, 1xEV-DO Rev. B
- SMBV-K96, GNSS extension to 24 satellites
- SMBV-K266, Galileo waveforms (generated with WinIQSIM2)
- SMBV-K285, LTE Release 10 (generated with WinIQSIM2)
- SMBV-K287, 1xEV-DO Rev. B (generated with WinIQSIM2)
- SMBV-K353, DAB+ Streams
- SMBV-K354, T-DMB/DAB Streams
- NRP-Z Level Control: Level can be continuously regulated using NRP-Z power sensors
- New remote control interface IVI-6.1 High Speed LAN instrument protocol (HiSLIP)
- New remote control emulation Rohde & Schwarz SMY

Modified Functionality

- 3GPP: Increased the dynamic range of dynamic power control to 60 dB if the power step size is at least 1 dB
- Pulse generator: New parameter ‘Use SIGNAL VALID as Pulse Sync’
- Listmode: The current index will be displayed now

Fixed Issues

- All digital modulations
  - Data list are interpreted in a wrong way.
  - If Pulse is selected for a marker, the tooltip for the parameter ‘Divider’ shows the unit Hz. Only GSM/Edge, Bluetooth, Tetra, IEEE 802.11 a/b/g/n; IEEE 802.16, GPS, Galileo, Glonass, Sirius, XM-Radio, DVB, DAB/T-DMB, Custom digital modulation, ARB, MCCW are affected.
  - The error message ‘External clock deviation or no connection!’ appears, if switching between a digital standard that selects external clock and a digital standard that select internal clock.
- 3GPP: The selected data list is not displayed in 3GPP downlink channel table
- ARB
  - The SCPI command SOURce1:BB:ARBitrary:WAVeform:DATA did not work
  - If the trigger mode is single, the graphics display showed always the I and Q signal. Only instruments with SMBV-B50 or SMBV-B51 are affected.
- Custom digital modulation: For OQPSK the symbol rate is limited to 37.5 MHz due to technical reason
- Pulse modulation: Wrong level while using ALC Table mode.
- All sweeps: While using mode ‘Extern Start/Stop’ 10% to 20% of the triggers will be ignored
- RF Level Sweep: Missing online help for parameter ‘Use Digital Attenuation’
- Maintenance System: Update packages generated with the ‘backup internal memory to usb’ could not be installed.
- Remote control via USB: If using viClear() the remote control interface does not accept new commands furthermore.

1.18 Version 2.20.230.115.1

Released : March 2012

Fixed Issues

- In rare cases, the SMBV100A does not boot and hangs with a black screen.

1.19 Version 2.20.230.115

Released : November 2011

New Functionality

- SMBV-K86, IEEE 802.11 ac
- SMBV-K93, GPS P-Code
- SMBV-K94, Glonass
- SMBV-K200, Waveform Package
- SMBV-K286, IEEE 802.11 ac (WinIQSIM2)
- SMBV-K294, Glonass (WinIQSIM2)

Modified Functionality

- Remote control emulation E4428, E4438, N5161, N5181, N5162, N5182:
  - Build up of the necessary directory structure in /var/user and accordingly /hdd, if the emulation is activated.
  - Added multi tone arb functionality
- Remote control emulation AF2050, AF2051, AF2052: Added functionality of custom digital modulation

Fixed Issues

- IEEE 802.11 a/b/g (WLAN): If trigger mode is Single, the Signal Duration could not be changed.
- Tetra: In rare cases the filter factors were wrong or not set.
- Custom Digital Modulation: If user filter is used the packet length was too short in rare cases.
- Digital Baseband Output and AWGN: The noise bandwidth was to small
- Save/Recall: The SCPI commands *SAV <number> and *RCL <number> did not work
- RF Frequency Sweep, Level Sweep and LF Frequency Sweep:
  - Dwell time was wrong on first step after reset sweep.
  - Mode Auto, shape Triangle: The dwell time on the first step was twice the value set in the sweep parameters.
  - In rare cases the modes Single, Extern Single and Extern Start/Stop did not work, after Listmode was active.
  - In rare cases after reset sweep the message “Value out of range” appeared and the sweep did hang-up.
- Listmode:

  - Mode Extern Single: Did not work.
  - Mode Extern Step: The instrument triggered on the positive slope always, regardless of the trigger slope setting.
- Multi Carrier CW: The focus frame was truncated on the Accept button.
- Remote control emulation E4428, E4438, N5161, N5181, N5162, N5182:
  - Corrected SCPI command MEM:DATA <string>,<block>
  - Corrected resolution of the MSUS file area.
- General:
  - In rare cases the message “LO power low” appeared, regardless if LO coupling is used.
  - The tooltip did not appear in all file selector dialogs.
  - In rare cases the firmware crashed while navigation in a combobox.
  - When using VNC to control the R&S SMBV100A the up-shift key did not work in the file manager.

1.20 Version 2.20.160.89

Released : June 2011

New Functionality

- SMBV-K84, Dig. Std. LTE Release 9, enhanced features

Modified Functionality

- Digital standard GPS and Galileo: Relative satellite power dynamic range increased from 20 to 21 dB.
- Digital standard GPS and Galileo: Maximum value of additional delay in multipath increased to 2.99999 chips.
- Level Sweep: New parameter ‘Using Digital Attenuation’. This parameter could be used to realize a level sweep without blanking the RF output. Please note: To use this functionality it is necessary to activate any IQ modulation.
- NRP-Z Power Viewer: The state of the NRP-Z sensor will be set to OFF after preset.

Fixed Issues

- Digital standard GPS and Galileo: A software issue is fixed in Auto Localization Mode for long duration simulation
- Digital standard 3GPP/FDD: The code domain wasn’t updated, if the compressed mode was changed.

- Digital standard EUTRA/LTE: If in the dialog Trigger/Marker/Clock the signal duration unit is set to Frame, then the firmware crashed if the signal duration was varied.
- User Correction: While creating a new user correction list, the firmware crashed.
- User Correction: After Preset the name of the user correction list was set to ‘none’.
- Dialog Software/Options: The title of the third column of the tables ‘Software Options (Internal)’ and ‘WinIQSIM (External Software Options)’ corrected to ‘Expiration Date’.
- Dialog Software/Options: Online help corrected.

1.21 Version 2.20.160.51.2

Released : May 2011

Fixed Issues

- Dig. Std. IEEE 802.16 WIMAX: The parameter ‘sequence length’ did not show a value.
- Writing the TCXO calibration value to EEPROM did fail in rare cases.
- SMBV-B1: Writing the OCXO calibration value to EEPROM could erase the serial number of the SMBV-B1.
- Instruments without SMBV-B10, SMBV-B50 or SMBV-B51 fails internal adjustment, when executed.
- Operating time does not count correctly.

1.22 Version 2.20.160.51

Released : April 2011

New Functionality

- SMBV-B1H, OCXO High Stability
- SMBV-K18, Dig. Baseband Connectivity
- SMBV-K44, Dig. Std. GPS
- SMBV-K65, Dig. Std. Assisted GPS
- SMBV-K66, Dig. Std. Galileo 6 satellites
- SMBV-K91, Dig. Std. GNSS extension to 12 satellites
- SMBV-K92, Dig. Std. GNSS enhanced (e.g. moving scenarios, multipath)

- New automatic level control state Sample & Hold High Accuracy (S&H High Accuracy). This mode improves the level accuracy and increases the frequency and level setting time up to 20 ms.
- Dig. Std. 3GPP
  - General Uplink:
    i) Instead of specifying the level of the total signal (i.e. the average power), it is possible now to specify the level during specific parts of the signal, like e.g. during the PRACH message part or during the first slot with active DPCCH by specifying a “level reference”.
    ii) The scheduling of uplink signals now can be visualized in a “scheduling list”.
  - HSDPA Downlink:
    i) The leveling for H-Set fixed reference channels was simplified by introducing the possibility of configuring the total HS-PDSCH power.
  - HSPA+ Downlink:
    i) The modulation and number of HS-PDSCH channelization codes in H-Set fixed reference channels now can be randomly varied over time, as needed for type 3i enhanced performance requirements tests.
    ii) The generation of the “other user’s channels” (OCNS) for type 3i enhanced performance requirements tests is possible now.
- New remote control emulation
  - Agilent

    E4421, E4422
  - Rohde & Schwarz

    SMT03

Modified Functionality

- Dig. Std. 3GPP
  - General Uplink:
    i) The 1024 chips delay of the uplink signal can be switched off now, if needed.
  - HSDPA Uplink:
    i) The scheduling of HS-DPCCH transmissions now is possible in a more flexible way.
    ii) Real time generation of the HS-DPCCH channel now is possible also in case the HS-DPCCH is scheduled by the HS-DPCCH scheduling table.
    iii) HSUPA Uplink:
    iv) The generation of E-DPDCH channels now can be restricted to the I or Q branch, if needed.

v) The scheduling of E-DCH packets now is possible in a more flexible way. The former DTX patterns have been replaced by an E-DCH scheduling table. This does not apply for E-DCH fixed reference channels (FRCs) with enabled HARQ Simulation.

vi) The E-DPCCH and E-DPDCH channels now are generated in real time if UL-DTX or dynamic power control is activated.

– HSPA+ Uplink:

i) UL-DTX now is possible also for other channels than DPCCH. The configuration of two UL-DTX cycles is possible and all dependencies between the transmissions of the channels are taken into account, in line with 3GPP TS 25.214.

ii) Now dynamic power control is possible also in combination with UL-DTX. The application of externally received power control commands is made in compliance with 3GPP TS 25.214; UL-DPCCH gaps are taken into account.

iii) Real time generation of the HS-DPCCH channel now is possible also if the HS-DPCCH contains HSPA+ content.

- NRP-Z Power Viewer is enabled automatically
- *RST performance improved when power sensors are connected

Fixed Issues

- Remote Control via USB: File transfer with MMEM files for files greater than 4 MByte.
- Dig. Std. 3GPP
  – General
    i) The code allocation for compressed mode method SF/2 was incorrect.
    ii) Switching between external and internal trigger will freeze or reboot the R&S® SMBV100A.
  – General Uplink
    i) The PCPCH Channel Coding was not working correctly.
    ii) Data sources were read out at the wrong positions in case of uplink compressed mode method SF/2.
  – General Downlink:
    i) In certain cases the TFCI state of DPCH channels was configured to be off (DTX) after selecting a reference measurement channel.
    ii) The generation of AICH and AP-AICH channels was incorrect.
- Custom Digital Modulation: Under certain conditions, when using control lists or data lists the R&S® SMBV100A will freeze or reboot.

1.23 Version 2.15.085.78

Released : July 2010

Modified Functionality

- Several enhancements for LTE/EUTRA (see separate release notes)

Fixed Issues

- The OCXO calibration value shows the wrong value after preset and power on.
- Under rare conditions sporadic errors occurs while accessing eeproms.

1.24 Version 2.15.085.70

Released : June 2010

Modified Functionality

- Selftest: Enhancement for BBGEN boards

Fixed Issues

- FM Stereo
  - Deviation not working as expected
  - SPDIF not working as expected
- Reference Oscillator: Adjustment DAC value isn't restored after power on
- Baseband Synchronization Mode: Master and Slave settings are not restored after power on
- Baseband Clock Settings: Measured clock doesn't display in Slave Mode

1.25 Version 2.15.085.47

Released : May 2010

New Functionality

- SMBV-K53, Dig. Std. T-DMB/DAB
- SMBV-K56, Dig. Std. XM Radio
- SMBV-K57, FM Stereo / RDS
- SMBV-K58, Dig. Std. Sirius Radio
- SMBV-K68, Dig. Std. TETRA Release 2

- SMBV-K253, T-DMB/DAB (WinIQSIM2 required)
- SMBV-K268, Dig. Std. TETRA Release 2 (WinIQSIM2 required)
- ARB : Sequencing with play lists
- New remote control emulation
  - Aeroflex

    AF2023, AF2024, AF2030, AF2031, AF2032, AF2040, AF2041, AF2042, AF2050, AF2051, AF2052
  - Agilent

    E4428, E4438, E8257, E8267, E8663, N5161, N5162, N5181, N5182, N5183
  - HP

    HP8642, HP8643, HP8644, HP8645, HP8647, HP8648, HP8656, HP8657, HP8664, HP8665
  - Rohde & Schwarz

    SML01, SML02, SML03
- Frequency and Level displays can be annotated in SETUP Security.
- Level unit is preserved during power off.
- Keyboard can be deactivated to prevent unauthorized modification of instrument settings. Configuration in SETUP Security or by SYSTem:KLOCk ON|OFF.
- Display can be deactivated to hide instrument settings. Configuration in SETUP Security or by SYSTem:DLOCk ON|OFF.
- 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.
- New sweep mode “External Start/Stop” for RF-, LF- and Level-Sweeps

Modified Functionality

- Setting time for ALC OFF TABLE IQ-Mode change to 2.5 ms
- ARB/multi segment mode : several improvements (single trigger with different clock rates)
- ARB/multi carrier mode : support of clipping
- External triggering: choice between "sync to external trigger" (with skipping first samples, default) and outputting from first sample (new).
- All digital standards: setups can now be saved in differential format
- Custom Dig Mod : new modulation AQPSK
- AWGN : C/N range extended to +40 dB
- Internal Graphics can be controlles remotely (eg. SOUR:BB:GRAP:SMAR:STAT ON;SOUR:BB:GRAP:STAT ON)

- Bluetooth: Upgraded to Core Specification 4.0 and Low Energy Enhancements
- Several enhancements for LTE/EUTRA (see separate release notes)
- Revised and simplified configuration of emulation settings in Remote Channel Settings dialog.
- Level Limit setting not affected by PRESET to protect devices under test (7801)
- Improved behavior of ATT FIX mode when configured while RF is OFF
- 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.
- 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.
- New SETUP NRP-Z Info dialog provides properties of all power sensors connected.
- Firmware of NRP-Z Power Sensors can be updated via R&S®SMBV100A.
- New SCPI command *:SYSTem:SHUTdown* powers off instrument via remote control.
- Optimized file dialog (tree view)

Fixed Issues

- IEEE 802.11n: MAC Header and FCS Config dialog to wide.
- MultiCarriesCW: Dialog size is zero
- Graphic: Phase offset not visible.
- Remote control: PM:SOUR INT,EXT not working as expected
- Remote control: SYSTem:KLOCk ON|OFF not working
- SCPI: octal pattern (eg. Using with data sources) not working.
- CDMA2000: Minor changes in online help.
- Custom Digital Modulation: Minor changes in online help.
- Multi Carrier CW: Minor changes in online help.
- Graphic: Minor changes in online help.
- Sporadic lockups in raw ethernet channel.
- Several issues regarding SCPI MMEM subsystem.
- 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 while storage is attached
- List Mode Step: Reset button does not work
- List Mode: Downloading lists by means of SCPI binary format does not work

1.26 Version 2.05.269.110

Released : April 2010

Fixed Issues

- **General:** Sporadic LO power low error messages

1.27 Version 2.05.269.109

Released : March 2010

Modified Functionality

- New mode "Variable Attenuated" for I/Q outputs and internal I/Q modulation (to be used for high-linear level settings)

Fixed Issues

- Sporadic errors accessing the hardware under rare circumstances.
  Typically the internal adjustment failed but was successful on second try. (8339)

1.28 Version 2.05.269.104

Released : December 2009

Fixed Issues

- **ARB:** Support of new SDRAM-Module (only for internal purpose) (8024)
- **Listmode:** Output level to low for frequency up to 1MHz and high power mode (8148)

1.29 Version 2.05.269.96

Released : August 2009

Modified Functionality

- **ARB:** Support of HDD Streaming
- **Custom Digital Modulation:** Support of User Filter
- **GSM Edge:** Support of sequence mode ‘Unframed’

Fixed Issues

- **Remote Control:** Files transferred with the SCPI Mass Memory system were not accessible (7746)
- **AWGN:** Mode 'Noise only' did not work without active baseband (7633)
- **ARB:** Multisegment waveforms did not work for more than 32 segments (7854)

1.30 Version 2.05.269.53

Released : April 2009

Fixed Issues

- **General:** Maintenance system did not boot
- **General:** Reference frequency differs by 16 Hz under rare conditions with SMBV-B1

1.31 Version 2.05.269.46

Released : March 2009

New Functionality

- SMBV-K41 (EDGE+)
- SMBV-K60 (Bluetooth)
- SMBV-K241 (EDGE+ with WinIQSIM2)
- SMBV-K244 (GPS with WinIQSIM2)
- SMBV-K260 (Bluetooth with WinIQSIM2)
- SMBV-K352 (Playback of HD-Radio Waveforms)
- New remote emulation modes for Aeroflex/IFR 205x and R&S SML

Modified Functionality

- **Listmode:**
  - Max value of dwell time increased
  - The mode STEP now can be remote controlled:

    [:SOURce]:LIST:INDex <nr> addresses the specified index

    [:SOURce]:LIST:TRIGger:EXEC executes a single list step
- **Network :** APIPA/Zeroconf to support automatic configuration in networks DHCP
- Accelerated operation of LTE and Wimax

- **Enhanced connectivity:** FTP and SAMBA file access possible to folder /var/smbv/share
- Common password for VNC, FTP and SAMBA (user=instrument, password=instrument)
- Operation of digital standards without hard disc optimized
- Frequency Offset has been extended to 67 GHz

EUTRA/LTE

Downlink

- TDD special subframes: automatic adjustment of parameters is now fully supported

Uplink

- PUSCH allocations are now displayed correctly in the time plan for frequency hopping type.
- PUCCH allocations and PUCCH region is displayed in the time plan.
- PRACH is displayed in the time plan.

3GPP-FDD

New Features

- HSUPA / HSPA+ Uplink
  - Fixed reference channels (FRC): Transport block size and channel allocation now is user configurable (User-FRC).
  - Uplink test models according to TS34.121 tables C.10.1.4, C.11.1.3, C.11.1.4
- HSPA+ Uplink
  - Uplink DPCCH slot format 4
  - UL-DTX mode for CPC simulation (“DPCCH Gating”)
- HSPA+ Downlink
  - F-DPCH slot formats 1 to 9 (“Enhanced F-DPCH”)
  - Fixed reference channel H-Set 12 for Dual Cell HSDPA tests (“DC-HSDPA”)
  - Downlink test models for Home base station tests (“Home NodeB”)

Changes

- Support for old release 4 uplink DPCCH slot formats 4 and 5 is discontinued.

Problems eliminated

- Uplink compressed mode: The configuration of TG pattern 2 was not recognized correctly.

Wimax

New features

- 2 Antenna STC modes (Matrix A and B) for AMC2x3
- Power offset of Baseband B

- MIMO UL Basic IE added to UL-MAP

Bugfixes

- Fixed bug in HARQ CRC
- Fixed pilot carrier bug for 4 Antenna STC modes
- Fixed dedicated pilot flag in DL-MAP for PUSC

Fixed Issues

- **Baseband:** Baseband phase offset does not work with SMBV-B50 and SMBV-B51 (7270)
- **LO Coupling:** Switching to LO coupling lead into the error message “General database error” (7144)
- **Network:** Sometimes LAN not available after power on due to failing DHCP (6728)
- **Save/Recall:** Storing files using MMEM instructions failed if the file already exist (affects SAV/RCL) (7197)
- **Screen Saver:** Backlight has not been switched off (7117)
- **User Correction:** User correction not effective after power off/on cycle (7206)
- **Rotary Knob:** Debouncing by using optimized time constants (7447)
- **Remote Control:** MMEM:CDIR did not work for LIST:CAT? (7474)
- **Remote Control:** BB:xxxx:TRIGger:ARM:EXECute causes sporadic crash (7388)
- **Remote Control:** Binary transmission of list mode data erroneous (7304)
- **AM:** Displays PEP value up to 6 dB wrong (7124)
- **General:** „Device key missing” after power on under rare conditions (7222)
- **General:** POW did not work as expected (7105)
- **General:** Shutdown shows no reaction for some seconds after pressing power key -> Progress bar (7482)

1.32 Version 2.05.200.22

Released : January 2009

Fixed Issues

- **GSM/EDGE:** GSM slot attenuation sometimes wrong with new BBGEN boards (problem has occurred only in factory; delivered devices are NOT affected)

1.33 Version 2.05.200.19

Released : November 2008

New Functionality

- Support of option SMBV-B50 Baseband generator (ARB only, 120 MHz RF BW)
- Support of option SMBV-B51 Baseband generator (ARB only, 60 MHz RF BW)

Modified Functionality

- **Analog Modulation AM/FM/PhiM:** Added impedance switching

Fixed Issues

- **General:** The message box device key missing appears
- **Save/Recall:** Save/Recall does not work correct (7041)

1.34 Version 2.05.200.09

Released : September 2008

New Functionality

- Support of option SMBV-K46 Dig. Std. CDMA2000 incl. 1 x EV-DV
- Support of option SMBV-K49 Dig. Std. IEEE 802.16
- Support of option SMBV-K50 Dig. Std. TD-SCDMA
- Support of option SMBV-K51 Dig. Std. TD-SCDMA enhanced BS/MS Tests
- Support of option SMBV-K54 Dig. Std. IEEE 802.11 n
- Support of option SMBV-K62 Additive White Gaussian Noise

Fixed Issues

- **3GPP FDD:** Clipping does not work (6893)
- **DVB:** The dialog System Configuration fitted to the display size of the SMBV (6838)
- **IEEE 802.11g:** The dialog MAC Header and FCS Configuration fitted to the display size of the SMBV (6842)
- **Listmode:** Listmode stops if the list range will be changed (6920)
- **Remote Control:** Queue overflow after syst:err? (6948)
- **Remote Control:** Reads via MMEM does not work (6974)
- **User Correction:** User Correction with Power Sensor not possible (7030)

1.35 Version 2.05.178.09

Released : August 2008

New Functionality

- Support of option SMBV-K47 Dig. Std. 1xEV-DO
- Support of option SMBV-K52 Dig. Std. DVB
- Support of option SMBV-K55 Dig. Std. EUTRA/LTE

Modified Functionality

- **Reference Oscillator:** The RF output could be deactivated, if no external reference is connected (6830)
- **Analog I/Q Output Settings:** The I/Q level resolution is changed from 1 mV to 1 µV (6829)
- Baseband Phase: Valid range is ± 900.99 degrees (6746)
- **Network:** The network settings will be displayed as read only, if IP address mode is DHCP (6727)
- **RF Menu:** New subgroups “Mod Gen” and “Sweeps” (6683)

1.36 Version 2.05.150.10

Released : July 2008

New Functionality

- Initial SMBV 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.

To perform this procedure, USB Device must be enabled in security settings.

Press 

, select **Security** and check **USB Device** setting

2.2 Updating the Firmware

Required equipment

Software: Firmware update file **SMBV_3.50.082.47.1.rsu**

Hardware: USB memory stick with enough free space to save the update file (about 150 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.

Some browsers change the extension of the update package from rsu to zip. In this case, please rename the file to the original name before proceeding.

- 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®SMBV100A

- 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.

Execute internal adjustments

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.

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

2.3 Alternative update procedures

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

2.3.1 Remote update via LAN

To perform this procedure, LAN connections must be enabled in security settings.

Press 

, select **Security** and check **Lan connections** setting

Precondition

Installed firmware version: **2.20.360.328 or higher**

Required equipment

Software: Firmware update file **SMBV_3.50.082.47.rsu**

To update an instrument with an old base board (see chapter 1) via LAN, download the file **SMBV_3.50.082.47.rsu_old_baseboard_lan_only** and rename it to **SMBV_3.50.082.47.rsu**

Hardware: An established LAN connection to the R&S SMBV100A.

Install new firmware on R&S®SMBV100A:

- Download update file to a PC.
- Switch on instrument.
- Wait until instrument is operational.

- Connect LAN cable to instrument.
- Press 

, select Network Settings and notice hostname or the ip address.
- On a PC open a file manager like Windows Explorer.
- Enter in the address line the hostname or IP address of the R&S SMBV100A, which should be updated.
- You will be ask for user and password during connection setup. Please enter **instrument** as user and password.
- The file manager shows several folders. Please copy the firmware update file to the folder **Update**.
- After copying the firmware update file to the folder Update. The update will be start automatically.
- The update procedure may take several minutes
- After finishing the software update the R&S SMBV100A will be shutdown.
- Restart instrument by pressing the power button.

Execute internal adjustments

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.

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

2.3.2 Apply USB memory stick while instrument is powered off

The firmware update procedure described in chapter 2.2 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.

2.3.3 Update firmware be means of the maintenance system

The R&S®SMBV100A 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 

Factory Preset to complete instrument initialization.

2.3.4 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 

Factory Preset to complete instrument initialization.

3 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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