

# R&S®SMBV100B

## Release Notes

**Firmware Version 5.30.047.32**

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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®SMBV100B is abbreviated as R&SSMBV100B.

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

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# 1 Information on the current version and history

## NOTICE

To ensure the R&S SMBV100B remains highly secure when being updated, only signed updates will be released.

This will make it possible to detect all future unsigned or manipulated updates.

The instrument's behavior can also be configured via

"Setup→Security→Security→General→Secure Update Policy".

These settings are password protected.

For more information, see the R&S SMBV100B User Manual.

## NOTICE

Specified frequency and level setting times for instruments with firmware version 5.00.044.43 and higher are increased by 0.1 ms.

## 1.1 Version 5.30.047.32

Released June 2024

| New Functionality / Changed Behavior |                                                                                          |         |
|--------------------------------------|------------------------------------------------------------------------------------------|---------|
| <b>GNSS</b>                          |                                                                                          |         |
|                                      | Generation of GNSS log data now blocked when real-time GNSS signal generation is running | 1264190 |
|                                      | User configurable Galileo OSNMA message                                                  | 900397  |
|                                      | Added GALILEO OSNMA testvector set                                                       | 1236678 |
| <b>DME</b>                           |                                                                                          |         |
|                                      | Changed Squitter Rate Limit to 8000/s                                                    | 1270957 |

| Fixed Issues             |                                                                   |         |
|--------------------------|-------------------------------------------------------------------|---------|
| <b>Analog Modulation</b> |                                                                   |         |
|                          | Am can not be switched on when Baseband is on                     | 1217716 |
| <b>Baseband</b>          |                                                                   |         |
|                          | Incorrect IQ Delay function with installed wideband DACW-BV board | 1266413 |

| Known Issues |                                                                                                                         |         |
|--------------|-------------------------------------------------------------------------------------------------------------------------|---------|
|              | AM Depth is not correct for modulation frequencies > 5 kHz                                                              | 1019250 |
| <b>GNSS</b>  |                                                                                                                         |         |
|              | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed. | 498094  |
|              | If start time is just before leap second insertion, the insertion might be omitted in log files.                        | 652559  |
|              | Issue with smoothing of trajectories                                                                                    | 466593  |

## 1.2 Version 5.30.047.27

Released: January 2024

| New Functionality / Changed Behavior |                                 |         |
|--------------------------------------|---------------------------------|---------|
| <b>General</b>                       |                                 |         |
|                                      | New datasheet version 12.00     | 1297381 |
| <b>GNSS</b>                          |                                 |         |
|                                      | Improved Inter-Signal Coherence | 1231812 |

| Fixed Issues   |                                                                                                                               |         |
|----------------|-------------------------------------------------------------------------------------------------------------------------------|---------|
| <b>General</b> |                                                                                                                               |         |
|                | Wrong name is displayed for option K363 in options management                                                                 | 1237549 |
|                | Selftest for DACBBV fails                                                                                                     | 1237175 |
| <b>GNSS</b>    |                                                                                                                               |         |
|                | Generator may re-boot when simulation is running at certain week roll-over dates and Galileo F/NAV is used                    | 1228525 |
|                | Navigation data bits are not correctly generated for BeiDou B1C for simulations running in the first seconds of a BeiDou week | 1231339 |

| Known Issues |                                                                                                                         |         |
|--------------|-------------------------------------------------------------------------------------------------------------------------|---------|
|              | AM Depth is not correct for modulation frequencies > 5 kHz                                                              | 1019250 |
| <b>GNSS</b>  |                                                                                                                         |         |
|              | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed. | 498094  |
|              | If start time is just before leap second insertion, the insertion might be omitted in log files.                        | 652559  |
|              | Issue with smoothing of trajectories                                                                                    | 466593  |

### 1.3 Version 5.30.047.24

Released: December 2023

| New Options                                  |  |  |
|----------------------------------------------|--|--|
| R&S® SMBVB-K363 CAR NAVIGATION TEST SUITE    |  |  |
| R&S® SMBVB-K469 DVB-RCS2 with R&S®WinIQSIM2  |  |  |
| R&S® SMBVB-K476 DVB-S2X-E with R&S®WinIQSIM2 |  |  |

| New Functionality / Changed Behavior |                             |         |
|--------------------------------------|-----------------------------|---------|
| <b>General</b>                       |                             |         |
|                                      | New datasheet version 10.00 | 1204637 |

|                     |                                                                                                                                                                                               |         |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                     | Internal adjustments can be configured to start automatically after warm up period and switch off instrument after execution. This facilitates performing adjustments in absence of operator. | 1042855 |
|                     | Added new feature Power Control.<br>R&S RF power sensors can now be used for closed loop power control of the RF output.                                                                      | 1042906 |
| <b>802.11be</b>     |                                                                                                                                                                                               |         |
|                     | Make bits 54 and 55 available for trigger frame - special user info field                                                                                                                     | 1084762 |
| <b>5G New Radio</b> |                                                                                                                                                                                               |         |
| General             | R17 FR2-2 test models for 960 kHz                                                                                                                                                             | 1068590 |
|                     | New filter that optimizes EVM                                                                                                                                                                 | 1094710 |
|                     | Channel bandwidth filter optimization for FR2 due to bad EVM                                                                                                                                  | 1073214 |
|                     | Allow resetting the slot in frame index (used for example to initialize DMRS sequences) following a custom period instead of the default period (equal to the number of slots in a frame)     | 1050711 |
|                     | Top level FRC wizard.                                                                                                                                                                         | 1072138 |
|                     | Ability to show incoming parameter dependencies.                                                                                                                                              | 949423  |
|                     | Manual configuration of DMRS setting in scheduling table                                                                                                                                      | 1037294 |
|                     | R17 NTN FRCs (38.181)                                                                                                                                                                         | 1048072 |
|                     | Support 38.521-2 UL test-models tables for FR2                                                                                                                                                | 1004235 |
|                     | Support DCI TRS availability indication                                                                                                                                                       | 953196  |
|                     | Write marker information into file on generate waveform                                                                                                                                       | 1027380 |
|                     | R17 DCI updates                                                                                                                                                                               | 975137  |
|                     | Add Peak Cancellation for 5G NR                                                                                                                                                               | 1044356 |
|                     | Allow datasource reset in units of slots in case of single numerology case                                                                                                                    | 1036965 |
|                     | Quick Settings: The number of slots now has a range of any value from 1 to 20                                                                                                                 | 1017322 |
|                     | Rel-16: add missing dci 0_1 parameter                                                                                                                                                         | 1042879 |
|                     | Rel-17 Add SSB Timeoffset                                                                                                                                                                     | 1044374 |
|                     | Rel-17: Add Fr2-2 testmodels up to 480 kHz subcarrier spacing                                                                                                                                 | 1031671 |
|                     | Options K171/K471 have been renamed (they also include Release 18)                                                                                                                            | 1201510 |

|                  |                                                                                                                                                                                                                                                                                 |         |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Test Case Wizard | Power limits are able to select from 38.141 or 38.104.                                                                                                                                                                                                                          | 1037405 |
|                  | Record the Scpi commands for current test case                                                                                                                                                                                                                                  | 956546  |
|                  | Show what options are missing for test cases                                                                                                                                                                                                                                    | 956560  |
| Downlink         | 2nd Downlink Assignment Index Field for DCI 0_1 and 0_2                                                                                                                                                                                                                         | 1061077 |
|                  | R17 DCI fields updates for 0_x and 1_x formats                                                                                                                                                                                                                                  | 1004293 |
|                  | Configurable offsets between slots for TBOMS                                                                                                                                                                                                                                    | 1095605 |
|                  | SRS Rel.17 support.                                                                                                                                                                                                                                                             | 1007385 |
|                  | Transport Block Over Multi Slots                                                                                                                                                                                                                                                | 979048  |
|                  |                                                                                                                                                                                                                                                                                 |         |
| <b>EUTRA/LTE</b> |                                                                                                                                                                                                                                                                                 |         |
|                  | LTE: Support of ARB sequence Length in Subframes together with Frames.                                                                                                                                                                                                          | 1036955 |
| <b>GNSS</b>      |                                                                                                                                                                                                                                                                                 |         |
|                  | Add new option K363 Car Navigation Test Suite                                                                                                                                                                                                                                   | 1173647 |
|                  | Added GALILEO OSNMA test vector set                                                                                                                                                                                                                                             | 1188333 |
|                  | Added new signal Beidou B2b                                                                                                                                                                                                                                                     | 1087157 |
|                  | Changed NavIC/IRNSS ephemeris reference time to be more similar to current SIS signals                                                                                                                                                                                          | 1196770 |
|                  | Installing a new firmware version now deletes internal pre-processed GNSS files for trajectories and antenna patterns. Especially for very long trajectories this may lead to increased start times when a trajectory is loaded for the first time after firmware installation. | 1069295 |
|                  | The frequency number of GLONASS satellites is no longer automatically read-only when satellites are sending navigation messages, but only in mode "Navigation" when "Nav Msg Control" is set to "Auto". In all other cases, the frequency number is editable now                | 1086736 |
|                  | Add new reference scenario based on broadcast data for GPS, Galileo, Glonass and BeiDou under Predefined Scenario's                                                                                                                                                             | 1044497 |
|                  | Add possibility to load satellite ephemeris for active GNSS systems at once from one combined RINEX file                                                                                                                                                                        | 1067433 |
|                  | Add satellite selection criteria based on Dilution of Precision (DOP)                                                                                                                                                                                                           | 1011478 |
|                  | Beidou B2a added Type40 Messages                                                                                                                                                                                                                                                | 1048038 |
| <b>HWP-UWB</b>   |                                                                                                                                                                                                                                                                                 |         |
|                  | HRP-UWB:SFD settings User1/2/3 are hidden.                                                                                                                                                                                                                                      | 1051824 |

| <b>OFDM</b>      |                                                                                            |         |
|------------------|--------------------------------------------------------------------------------------------|---------|
|                  | DC sub carrier handling modes puncture and skip                                            | 1174793 |
|                  | Support Cyclic Suffix (CS) for OFDM                                                        | 1089708 |
| <b>DME</b>       |                                                                                            |         |
|                  | Added Dynamic range distance simulation for DME reply mode                                 | 946068  |
|                  | Added the possibility to set the reply efficiency for a configurable burst of reply pulses | 1105871 |
|                  | Added support for NRP-18P                                                                  | 1094964 |
| <b>DVB-S2X-E</b> |                                                                                            |         |
|                  | First version to support option SMBVB-K476                                                 | 1209979 |
| <b>DVB-RCS2</b>  |                                                                                            |         |
|                  | First version to support option SMBVB-K469                                                 | 1209980 |

### Fixed Issues

|                                             | AM and FM is not working concurrently                                                                    | 1221349 |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------|---------|
| <b>5G New Radio</b>                         |                                                                                                          |         |
| General                                     | dmrs port 1000 showed wrong data for dmrs values                                                         | 1176845 |
|                                             | Editing the antenna port table of shared channel allocations when using cylindrical mapping did not work | 1082049 |
|                                             | Peak Cancellation fails in case reached cfr is not as good as desired by user                            | 1096846 |
|                                             | PSSCH/PSCCH Settings - unexpected horizontal scrollbar at dialog                                         | 1172982 |
|                                             | TBOMS has a rate matching issue.                                                                         | 1174971 |
|                                             | Value of Delta f to Carrier for GUI Paramer for S-SSPBCH calculated incorrectly                          | 1185072 |
|                                             | Waveform file generation does not correctly update marker-information                                    | 1083928 |
|                                             | Software crashes when closing the timeplan after zooming                                                 | 1197541 |
|                                             | Some RNTI ranges corrected, set MCCH-RNTI and PEI-RNTI to fixed values                                   | 1178506 |
|                                             | FR2-2 test models do not correctly repeat after 80 slots                                                 | 1209276 |
|                                             | Faulty recall of carrier mapping using global savefiles                                                  | 1031252 |
|                                             | The delta frequency of a carrier can have an unwanted offset                                             | 1056531 |
|                                             | Delta f value not correctly restricted for FR2_2                                                         | 1049829 |
| Quick Setting: Slot Period 1 cause an error | 1051697                                                                                                  |         |



|                  |                                                                                                                                                                                                                  |         |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                  | Settings transfer broken in beta 22.09                                                                                                                                                                           | 1019190 |
|                  | Interval of Datasource reset is calculated wrong in case of scs higher 120 kHz                                                                                                                                   |         |
|                  | SCPI set command for DCI Candidate does not work                                                                                                                                                                 | 986418  |
|                  | SRS periodicity had the same SCPI command as Allocation repetition. SRS periodicity command is modified now                                                                                                      | 1026794 |
|                  | Switching off RMC switches on 'restrict to search space'                                                                                                                                                         | 1010753 |
|                  | Timeplan: Grid and axis scaling are incorrect for subcarrier spacing 480 kHz and 960 kHz                                                                                                                         | 1036825 |
|                  | O-RAN: TC 3.2.3.1.17 has wrong payload in symbol #10 when using O-RAN data source feature                                                                                                                        | 1017268 |
| Test Case Wizard | Increase wanted signal power limit to 50dBm for TC 6.7                                                                                                                                                           | 1073884 |
| Downlink         | Crash while increasing the CSI-RS rows                                                                                                                                                                           | 1100831 |
|                  | Correct Interferer RF Frequency Calculation for TC 7.7 RX Intermodulation Narrowband                                                                                                                             | 1037716 |
|                  | Minimal Value of the PDSCH BWP Setting Multi Time Domain Allocations is wrong                                                                                                                                    | 1044641 |
|                  | SS/PBCH can be wider than carrier carrier channel bandwidth.                                                                                                                                                     | 1067434 |
| Uplink           | SRS start index calculation incorrect                                                                                                                                                                            | 1104132 |
|                  | SRS periodicity in scheduling table has no effect on signal                                                                                                                                                      | 1058466 |
|                  | Wrong configuration of the UCI payload length might lead to a firmware crash                                                                                                                                     | 1016354 |
| <b>EUTRA/LTE</b> |                                                                                                                                                                                                                  |         |
|                  | Wrong subframe index issue                                                                                                                                                                                       | 1094264 |
|                  | Uplink: In case of TDD with a sequence length which is not a multiple of frames, signal parts can be missing or the level can be wrong. The issue was only in beta versions, not in officially released versions | 1070151 |
|                  | 3MHz and 5MHz PBSCCH mapping for DMRS is fixed for sidelink                                                                                                                                                      | 1015750 |
|                  | Calculation of the NID1 is fixed                                                                                                                                                                                 | 1014576 |
|                  | NB-IoT: TM mode N-TM_Guardband is not correct leads to deltaFTtoDc is wrong                                                                                                                                      | 1061190 |
| <b>GNSS</b>      |                                                                                                                                                                                                                  |         |
|                  | For some data files import of WAAS constellation and correction data may not work correctly                                                                                                                      | 896721  |
|                  | Approximation of curves in arc-line trajectory format is slightly noisy                                                                                                                                          | 1076425 |
|                  | Under some circumstances user receiver yaw and pitch are set to zero if receiver stands still for arc-line trajectories or generally when align to motion is utilized                                            | 1085888 |
|                  | In "Tracking" mode, the "Nvg Msg" Type of signal L1C is not displayed if the Nav Msg of signal C/A is deactivated                                                                                                | 1088685 |
|                  | Instrument may crash when intentionally generating acquisition data for satellites that are not present in constellation                                                                                         | 1172969 |
|                  | Instrument may freeze while trying to save the changes in body mask, antenna pattern, vertical obstacles and roadside planes editors                                                                             | 1044777 |

|                  |                                                                                                                                                                                                                          |         |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                  | Incorrect *.kml file input may lead to generator becoming non-responsive                                                                                                                                                 | 1167087 |
|                  | Incorrect signal levels for several signals                                                                                                                                                                              | 1106724 |
|                  | For cyclic trajectories last waypoint which is added in cyclic mode may worsen the acceleration profile                                                                                                                  | 1090753 |
|                  | For GPS L1 C/A at the end of the GNSS week a reserved subframe instead of an almanac subframe is coded into navigation data message                                                                                      | 1006917 |
|                  | Galileo E1-B I/NAV Secondary Synchronization Pattern missing                                                                                                                                                             | 1064107 |
|                  | When importing GNSS constellations from RINEX files via GUI the preview of very large RINEX files is slow                                                                                                                | 1080258 |
|                  | Wrong scale factor used when showing TGD values for BeiDou B1I within GUI                                                                                                                                                | 1174699 |
|                  | Receiver position visualization in GUI Ground Track View may not be updated correctly for a receiver trajectory extending over a large distance relative to earth surface                                                | 1093090 |
|                  | After loading RINEX files which contain no visible satellite for a GNSS system at the simulation start time under some conditions a non-visible satellite may be marked visible in the GUI satellite view.               | 1079089 |
|                  | 'Error hardware or software option missing' is sporadically shown when clicking Synchronize in Assistance Data Generation.                                                                                               | 1038529 |
|                  | Inconsistencies in logging data for SBAS.                                                                                                                                                                                | 491788  |
|                  | Raise an info message in case timestamps do not start with 0.0 of imported '.xtf' trajectory file.                                                                                                                       | 864640  |
|                  | For satellites rising during a simulation scenario with limited satellite number or with fully occupied hardware -> Resources may not get activated later when a satellite slot gets free because of a sinking satellite | 1038716 |
|                  | Simulated Glonass constellation changes after simulation startup at certain dates when using default Glonass configuration                                                                                               | 1034523 |
|                  | GPS almanacs are not provided with Novatel receivers when a GPS satellite is not present in the constellation                                                                                                            | 1028805 |
| <b>802.11</b>    |                                                                                                                                                                                                                          |         |
|                  | Set to default does not properly set the antenna configurations                                                                                                                                                          | 1043899 |
| <b>802.11.ac</b> | Incorrect LDPC PPDU encoding process in some cases                                                                                                                                                                       | 1098220 |
|                  |                                                                                                                                                                                                                          |         |
| <b>802.11ax</b>  | Incorrectly calculated number of A-MPDU padding bytes with some HE-TRIG configurations.                                                                                                                                  | 1080436 |
|                  | Firmware crash when selecting RU-996 with HE-160 for 2nd content channel                                                                                                                                                 | 1104801 |
|                  | Update preamble puncturing to latest specification version                                                                                                                                                               | 1108272 |
| <b>802.11be</b>  | application crash with 320MHz and 140 users                                                                                                                                                                              | 1077114 |
|                  | configuration for user numbers 139 - 144 not available                                                                                                                                                                   | 1030875 |
|                  | disable combination of MCS14 and trigger based frames in 20MHz                                                                                                                                                           | 1020120 |
|                  | EHT-TRIG frame format issue in 80MHz                                                                                                                                                                                     | 1080442 |
|                  | firmware crash with EHT-MU, 320MHz and 144 configured users                                                                                                                                                              | 1030872 |
|                  | incorrect constellation mapping for MCS14 in 320MHz                                                                                                                                                                      | 1021646 |
|                  | incorrect EHT-STF normalization for 2nd 484 tone RU.                                                                                                                                                                     | 1076573 |

|                  |                                                                                                                  |         |
|------------------|------------------------------------------------------------------------------------------------------------------|---------|
|                  | incorrectly calculated number of EHT-SIG symbols with EHT-SIGB MCS 15 and a large number of users.               | 1078896 |
|                  | MRU indices 5-8 not working correctly in 160MHz                                                                  | 1025710 |
|                  | partially wrong 11be waveforms because of incorrect punctured MRU index                                          | 1043484 |
|                  | Bugfix in segment deparser                                                                                       | 1175599 |
|                  | Data field power factor incorrect with 2 users, 2x2 MIMO and OFDMA disabled                                      | 1084309 |
|                  | Incorrect power scaling for users in trigger based frames.                                                       | 1105006 |
|                  | Some large size MRUs in 160 and 320MHz are not working                                                           | 1078873 |
|                  | When user state is off, the STA ID will be set to 2046, and when user state is on, STA ID can not be set to 2046 | 1107497 |
| <b>HWP-UWB</b>   |                                                                                                                  |         |
|                  | Failure between PHR and PSDU which six zero bits are not correctly put into the gap for HPRF mode                | 1171268 |
|                  | Appending of six Zeros to PHR.                                                                                   | 1107048 |
|                  | Power level is fixed in BPRF mode for STS configuration 1.                                                       | 1014838 |
|                  | Fix for Default value for Sync Length in different modes.                                                        | 1082831 |
|                  | Power fixed for higher payload Lengths.                                                                          | 1025032 |
|                  | Trigger Length calculation is fixed in BPRF mode.                                                                | 1019503 |
|                  | Up sampling value is not adjusted according to the SMBVB hardware configuration.                                 | 1203169 |
|                  | Fix for filter for Oversampling 1                                                                                | 1207551 |
|                  | IQ Modulation status is not switched to "Mod On" when the standard is switched on                                | 1186391 |
| <b>VOR/ILS</b>   |                                                                                                                  |         |
|                  | 4 Letters where not supported with some character combinations                                                   | 1190233 |
| <b>DME</b>       |                                                                                                                  |         |
|                  | Sporadically erroneous output signal for DME:FLIGHT and DME:VEL without *OPC?                                    | 1051008 |
|                  | Fixed power sensor error message after reboot. Instrument raised wrong "Invalid NRP Sensor" message.             | 1011823 |
|                  | Reply Efficiency Probability was broken. First all "No Replies" where performed, followed by all "Replies"       | 1055538 |
|                  | Squitter distribution had streaks of same value in somewhat deterministic way                                    | 1055537 |
| <b>NFC</b>       |                                                                                                                  |         |
|                  | SCPI command :NFC:CBLOCK1:DURATION shows error message                                                           | 1186041 |
| <b>Bluetooth</b> |                                                                                                                  |         |
|                  | BLE setting error message                                                                                        | 1103112 |
|                  | SCPI command Filter/Clipping                                                                                     | 1205383 |
|                  | Sequence Length number when switch on/off Dirty Transmitter Test.                                                | 1100786 |
|                  | Issue of single trigger which produces wrong number of trigger events for wideband instruments.                  | 1168604 |

|             |                                                                                                                                                                                     |         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|             | Signal duration issue in case of single trigger mode.                                                                                                                               | 1181007 |
|             | Unsuitable value range of impulse length from GUI part                                                                                                                              | 1093198 |
|             | Set the parameter Corrupted CRC Every 2nd Packet to ready only and it can not set through GUI or scpi while Number of Packets per Set set to 1 and Dirty Transmitter Test set to On | 1098222 |
| <b>OFDM</b> |                                                                                                                                                                                     |         |
|             | Missing warning if configuration is out of specification.                                                                                                                           | 1047939 |
|             | Split Pattern not transmitted in Settings Transfer                                                                                                                                  | 1183157 |
|             | Waveform generation sometimes fails with Datalnit error, with only switching state to off and on again solving the problem                                                          | 1185661 |
|             | Timeplan does not scale correctly                                                                                                                                                   | 1002976 |

|                     |                                                                                                                         |         |
|---------------------|-------------------------------------------------------------------------------------------------------------------------|---------|
| <b>Known Issues</b> |                                                                                                                         |         |
|                     | AM Depth is not correct for modulation frequencies > 5 kHz                                                              | 1019250 |
| <b>GNSS</b>         |                                                                                                                         |         |
|                     | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed. | 498094  |
|                     | If start time is just before leap second insertion, the insertion might be omitted in log files.                        | 652559  |
|                     | Issue with smoothing of trajectories                                                                                    | 466593  |

## 1.4 Version 5.10.035.40

Released: August 2023

### New Options

None

### New Functionality / Changed Behavior

None

### Fixed Issues

|  |                                                      |         |
|--|------------------------------------------------------|---------|
|  | High output level for 10 ms wenn ARB is switched off | 1180664 |
|  | Baseband selftest fails sporadically                 | 1103090 |

## 1.5 Version 5.10.035.34

Released: February 2023

### New Options

None

### New Functionality / Changed Behavior

None

### Fixed Issues

Improvements for manufacturing

## 1.6 Version 5.10.035.27

Released: December 2022

### New Options

R&S® SMBVB-K123 MODERNIZED GLONASS

R&S® SMBVB-K170 5G NR SIDELINK

R&S® SMBVB-K171 5G NR RELEASE 17

R&S® SMBVB-K27 PULSE TRAIN

R&S® SMBVB-K980 HUMS

### New Functionality / Changed Behavior

#### General

|  |                                           |        |
|--|-------------------------------------------|--------|
|  | SMBVB-K980 HUMS now available on SMBV100B | 905696 |
|--|-------------------------------------------|--------|

|                     |                                                                                                                                                     |           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                     | SMBVB-K27 Pulse Train now available on SMBV100B                                                                                                     | 996314    |
| <b>Baseband</b>     |                                                                                                                                                     |           |
|                     | 802.11be: support signalling of 320MHz channelization in U-SIG                                                                                      | 1019456   |
|                     | 802.11be: add support for punctured RUs in OFDMA mode.                                                                                              | 942903    |
|                     | 802.11be: added non-OFDMA DL MU-MIMO                                                                                                                | 911554    |
|                     | 802.11: New parameter Frame Delay supporting waveform time shift.                                                                                   | 954461??? |
|                     | Delivery of RTK corrections in RTCM 3 format via integrated Ntrip server supported                                                                  | 925261    |
|                     | Generate Waveform: Add Markers to exported waveform file                                                                                            | 992643    |
| <b>AWGN</b>         |                                                                                                                                                     |           |
|                     | Incorrect display of signal and noise power values for analog IQ and BBMM outputs / incorrect min/max limitation of C/N value for analog IQ outputs | 933250    |
| <b>5G New Radio</b> |                                                                                                                                                     |           |
| General             | First version to support options K171 (5G NR Release 17)                                                                                            | 815219    |
|                     | Up to 256 subframes are now configurable.                                                                                                           | 957180    |
|                     | Add support for new TCs for Release 16: 8.2.10, 8.2.11, 8.3.7 - 8.3.10                                                                              | 862634    |
|                     | Firmware is compatible to 3GPP spec 17.3.0.                                                                                                         | 1011290   |
|                     | CSI-RS and SRS can be configured via scheduling table.                                                                                              | 524481    |
|                     | Implement all FR2-2 Bandwidths as suggested by R4-2202364.                                                                                          | 968147    |
|                     | Input of sequence length in subframes.                                                                                                              | 1000256   |
|                     | Increased maximum RF frequency for phase compensation in manual mode to 999GHz                                                                      | 991770    |
|                     | Introduce a Simple GUI mode which disables non custom DCI types and hides related parameters. Group all DCI related features into control sections. | 958794    |
|                     | Make internal debugging info visible without protection level. Caution, the shown information might change in future software version.              | 983917    |
|                     | New FRC G-FR1-A8 of 38.141-1 and G-FR1-A9 of 38.141-2 is added in TC 8.2.1 according to V17.6.0.                                                    | 968201    |
|                     | O-RAN: Support compression test-cases 3.2.3.1.2-3.2.3.1.11 and 3.2.5.1.2-3.2.5.1.12 for 100MHz 30kHz                                                | 971949    |
|                     | Selectable RF reference for each carrier auto phase compensation.                                                                                   | 961187    |

|                                                                                                                   |        |
|-------------------------------------------------------------------------------------------------------------------|--------|
| Support data-source distinction for multi-carrier copy carrier                                                    | 973776 |
| Support desired and blocking channel only mode in the TCW for some chapter 7 cases.                               | 946604 |
| Support manually scheduled SRS Resource Type Aperiodic.                                                           | 986052 |
| Support new R17 DCI Format 2_7.                                                                                   | 953190 |
| Support new signal type RIM-RS.                                                                                   | 751570 |
| Test case wizard support bandwidth 35MHz and 45MHz for release 17.                                                | 968199 |
| Time Plan: Add mouse drag functionality once we zoom in the Time Plan                                             | 922134 |
| Update available number of resource blocks per SCS and Bandwidth according to 38.101-2 v17.6.0.                   | 916650 |
| O-RAN: Support compression test-cases 3.2.3.1.2-3.2.3.1.11 and 3.2.5.1.2-3.2.5.1.12 for 100MHz 30kHz              | 971949 |
| Selectable RF reference for each carrier auto phase compensation.                                                 | 961187 |
| Support data-source distinction for multi-carrier copy carrier                                                    | 973776 |
| Support desired and blocking channel only mode in the TCW for some chapter 7 cases.                               | 946604 |
| Support manually scheduled SRS Resource Type Aperiodic.                                                           | 986052 |
| Support new R17 DCI Format 2_7.                                                                                   | 953190 |
| Support new signal type RIM-RS.                                                                                   | 751570 |
| Test case wizard support bandwidth 35MHz and 45MHz for release 17.                                                | 968199 |
| Time Plan: Add mouse drag functionality once we zoom in the Time Plan                                             | 922134 |
| Update available number of resource blocks per SCS and Bandwidth according to 38.101-2 v17.6.0.                   | 916650 |
| Add new allocation type Puncturing, which punctures zero energy holes into the signal.                            | 880616 |
| Update specification version to 16.8.0                                                                            | 936392 |
| Up to 400 SFs may be displayed in the timeplan                                                                    | 913604 |
| Align with spec.-version 16.7.0                                                                                   | 888968 |
| Change naming within the timeplan of conflict to overlap and change colour scheme (indicating warning not danger) | 930888 |
| Clarify Point A definition by renaming Point A to Carrier Center to Point A to Baseband Center.                   | 923367 |
| First version to support option K470 5G NR Sidelink                                                               | 739208 |

|          |                                                                                                                                                                         |        |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|          | Update 3GPP Spec to 17.0.0                                                                                                                                              | 951651 |
|          | K145: Allow custom line rates to be set for serial feedback line                                                                                                        | 923096 |
|          | O-RAN: Add TMs 3.2.6.1.1-3.2.6.1.5 for 100 MHz                                                                                                                          | 887418 |
|          | O-RAN: Support for 3.2.3.1.X and 3.2.5.1.X TMs for SCS=15kHz and BW >= 20MHz                                                                                            | 920113 |
|          | O-RAN: Support for 3.2.6.1.1-3.2.6.1.5 for 100MHz 30kHz                                                                                                                 | 923504 |
|          | Possibility to copy other carriers or to load single carrier out of a nr5g file.                                                                                        | 908844 |
|          | Sidelink: Support message type PSSCH/PSCCH with DMRS                                                                                                                    | 721736 |
|          | Sidelink: Support S-SSPSBCH generation.                                                                                                                                 | 721746 |
|          | Add possibility to sum up multiple multi layer carriers.                                                                                                                | 922407 |
|          | Add new R17 bandwidths and numerologies (K171 needed).                                                                                                                  | 852075 |
|          | O-RAN: Support for 3.2.3.1.X and 3.2.5.1.X TMs for BW < 20MHz                                                                                                           | 924371 |
| Downlink | Addition of new parameter for selecting the table used for time domain resource allocation being applied for creation of PDSCH                                          | 932641 |
|          | Add support for DCI 3_0 and 3_1.                                                                                                                                        | 722054 |
|          | Make Coreset DMRS reference point configuration explicit. Warning, this can break configurations with CoresetID == 0. Please use the new reference point configuration. | 974549 |
|          | Support of Test Model 2b and 3.1b defined in 17.5.0 spec.                                                                                                               | 958666 |
|          | Rel-17 feature, add new SCS and cases for SS/PBCH for FR2-2                                                                                                             | 916648 |
|          | IAB-MT reference measurement channels for PDCCH                                                                                                                         | 885011 |
|          | Configurable PDSCH power for allocations generated through DCI                                                                                                          | 924036 |
|          | Rel-17 feature, enable coding for 1024 QAM                                                                                                                              | 916652 |
| Uplink   | Rel-17 feature, new Test Models for 35&45 MHz                                                                                                                           | 918873 |
|          | Add new FRC G-FR1-A8 of 38.141-1 and G-FR1-A9 of 38.141-2.                                                                                                              | 968553 |
|          | Draw the PUCCH payload bits from a single data source (e.g. a PN sequence).                                                                                             | 926173 |
|          | Draw the PUSCH UCI payload bits from a single data source (e.g. a PN sequence).                                                                                         | 939105 |
|          | Rel-17 feature, more prbs supported for PUCCH for FR2-2                                                                                                                 | 928100 |



|                  |                                                                                                                                                                                                                                                                                                                                                   |        |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                  | Rel-17 feature, new scs for PRACH                                                                                                                                                                                                                                                                                                                 | 927164 |
|                  | /User/BWP: Some new FRCs for Rel.16                                                                                                                                                                                                                                                                                                               | 862635 |
| Setting Transfer | Settings Transfer: Add basic support for PUCCH format 3&4.                                                                                                                                                                                                                                                                                        | 897124 |
| <b>EUTRA/LTE</b> |                                                                                                                                                                                                                                                                                                                                                   |        |
| General          | LTE Sidelink: 64QAM support added.                                                                                                                                                                                                                                                                                                                | 944854 |
|                  | Optional baseband frequency sweep for NB-IoT and eMTC.                                                                                                                                                                                                                                                                                            | 784608 |
|                  | New 1024QAM test models (E-TMs 2b and 3.1b) of 3GPP TS 36.141.                                                                                                                                                                                                                                                                                    | 934411 |
|                  | O-RAN: Support for 3.2.3.7.X and 3.2.5.7.X TMs for BW < 20MHz                                                                                                                                                                                                                                                                                     | 926024 |
|                  | O-RAN: Support K175 U-Plane generation for NB-IoT                                                                                                                                                                                                                                                                                                 | 926024 |
|                  | O-RAN: Uplink: Support U-Plane generation for Uplink (excluding PRACH)                                                                                                                                                                                                                                                                            | 909935 |
|                  | O-RAN: Support for 3.2.3.7.X and 3.2.5.7.X TMs for 10MHz/20MHz                                                                                                                                                                                                                                                                                    | 896594 |
|                  |                                                                                                                                                                                                                                                                                                                                                   |        |
| <b>GNSS</b>      |                                                                                                                                                                                                                                                                                                                                                   |        |
|                  | Added possibility to generate assistance data generation for Navic                                                                                                                                                                                                                                                                                | 913178 |
|                  | QZSS LNAV - removed re-transmission of GPS data which was a remnant from IS-QZSS-JAXA (LNAV(L1C/A))                                                                                                                                                                                                                                               | 985661 |
|                  | Add additional 3GPP2020 scenarios including QZSS and NAVIC (based on draft standard)                                                                                                                                                                                                                                                              | 978942 |
|                  | Changed QZSS L/NAV ephemeris and clock update rate from 15min to 1h to be more consistent with nominal SIS update rate                                                                                                                                                                                                                            | 956906 |
|                  | Increased Galileo I/NAV and F/NAV ephemeris update rate to be more similar to current SIS update rate                                                                                                                                                                                                                                             | 982293 |
|                  | Increase max Attenuation for Body Mask/Antenna Pattern (values $\geq 40.0$ are handled as obscured)                                                                                                                                                                                                                                               | 904669 |
|                  | Changed range of yaw/heading parameter of receiver attitude definition to [0, 360]. For backward compatibility values between [-180, 0] are still allowed by SCPI interface and waypoint file import. The values will be internally mapped to the respective value of the new range definition.                                                   | 934643 |
|                  | Changed range of pitch/elevation parameter of receiver attitude definition to [-90, 90]. The change is not backward compatible and values outside the [-90, 90] range will not be supported. It is still possible to import trajectory files with out-of-range pitch value definitions, in this case quality of the simulation is not guaranteed. | 934644 |
|                  | Add new 3GPP 2020 scenarios based on 3GPP TS 37.571-5 V16.6.0 (2021-09)                                                                                                                                                                                                                                                                           | 912353 |
|                  | Velocity (Pseudorange Rate) in tracking mode does lead to an RF signal with opposite Doppler sign.                                                                                                                                                                                                                                                | 944404 |

| <b>HWP-UWB</b> |                                                                            |        |
|----------------|----------------------------------------------------------------------------|--------|
|                | STS Data can be configured Bitwise.                                        | 977043 |
|                | Extra SFD Lengths are added                                                | 890953 |
|                | Filter for 15.4z supported.                                                | 847459 |
|                | Fixed 2ms Frame Length is added.                                           | 938033 |
|                | Text LSB is Transmitted First is added for Data Sources.                   | 898371 |
| <b>OFDM</b>    |                                                                            |        |
|                | Support CAZAK Preamble with a Zadoff Chu Sequence                          | 958232 |
|                | Support of Custom Constellation                                            | 957648 |
|                | Support of Split Pattern for Allocations in both frequency and time domain | 949974 |

| <b>Fixed Issues</b> |                                                                                                    |         |
|---------------------|----------------------------------------------------------------------------------------------------|---------|
| Phase-modulation    | Deviation of Path 2 is not set correctly                                                           | 944326  |
| OneWeb              | Single trigger mode is fixed.                                                                      | 993161  |
| 3GPP                | Updating of Symbol rate for user coding                                                            | 1021027 |
| Global Connectors   | Incorrect settings applied in some cases when RF is switched on                                    | 1021540 |
| OFDM                | Time plan can show symbol #0 twice                                                                 | 981990  |
| Generate Waveform   | Add Markers to exported waveform file                                                              | 992643  |
|                     |                                                                                                    |         |
| <b>AWGN</b>         |                                                                                                    |         |
|                     | Incorrect signal when using noise only mode after starting the instrument.                         | 973583  |
|                     |                                                                                                    |         |
| <b>5G New Radio</b> |                                                                                                    |         |
| General             | Checkboxes Unique Data Source for ... had a wrong behavior for enabling/disabling other parameters | 1000907 |
|                     | For coupled system configs and a very high number of frames the application can crash.             | 981427  |

|                                                                                                                                                                                                                                                                       |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Buggy parameter values after a recall of device settings when working with auto phase compensation.                                                                                                                                                                   | 1007421 |
| Copy To and repetition-mode issues if only showing a certain user in the Scheduling table.                                                                                                                                                                            | 959766  |
| Empty scheduling table for subframe number 160 and bigger.                                                                                                                                                                                                            | 957289  |
| Error if no carrier is mapped on a block output.                                                                                                                                                                                                                      | 951935  |
| Errors while activating feedback mode for coupled per entity system configurations.                                                                                                                                                                                   | 554021  |
| FR2-2 default waveform results in a bad EVM as SSB overlaps with PDSCH DMRS.                                                                                                                                                                                          | 967851  |
| Issue while loading save files with different older versions.                                                                                                                                                                                                         | 947852  |
| Missing adjustments for blocks >2 when loading a global safe-file.                                                                                                                                                                                                    | 952638  |
| In Advanced System Configurations, if the number of entities is higher than 2 and the BB Source Config is set to Separate Sources, setting the baseband trigger source to External Global Trigger 2 might fail with the device showing a corresponding error message. | 953321  |
| K148: Using real-time filter off in coupled system configuration crashes the firmware                                                                                                                                                                                 | 963669  |
| O-RAN: K175 Output may create double signed values (1+-0j)                                                                                                                                                                                                            | 975363  |
| O-RAN: TMs 3.2.5.1.6 and 3.2.3.1.10 erroneously reset to invalid version for <= 10MHz                                                                                                                                                                                 | 975363  |
| Quick Settings: Channel Spacing is limited to 300 MHz for K525                                                                                                                                                                                                        | 997429  |
| Saving the xml for Settings Transfer is not possible in case pi/2 modulation for Pxsch is being used                                                                                                                                                                  | 1005215 |
| Settings transfer broken in beta 22.09.                                                                                                                                                                                                                               | 1019190 |
| Settings Transfer: MCS Table 4 is not forwarded.                                                                                                                                                                                                                      | 952609  |
| UCI bits mapped between PUSCH DMRS symbols in UCI only mode.                                                                                                                                                                                                          | 995454  |
| Dysfunctionalities and crash when single user mode was selected in the scheduling table.                                                                                                                                                                              | 997822  |
| The New Radio application in non-average power modes like the constant PSD power mode can generate to high output power on SMW200A equipped with faders. A detailed description is available for this bug.                                                            | 988396  |
| Creating waveform including a Rim-Rs signal fails                                                                                                                                                                                                                     | 1005081 |
| SSB indices calculated incorrectly for SSB using either SCS of 120 kHz or 240 kHz using bitmaps with at least 17 and 33 consecutive ones respectively                                                                                                                 | 989348  |
| Timeplan: Axis scaling is not updated if grid is on (coarse or fine) and scs changes                                                                                                                                                                                  | 1014469 |
| Two Coresets with different CCEs are displayed as conflicting in the timeplan.                                                                                                                                                                                        | 928603  |
| Some parameters are not included in the generators' SCPI export.                                                                                                                                                                                                      | 886923  |
| Progress bar does not show up for long signal calculations.                                                                                                                                                                                                           | 891801  |
| New timeplan axis was not correctly scaled in some conditions, i.e. subcarrier spacing was not considered correctly                                                                                                                                                   | 888409  |
| Slot Format Index 1 or 2 in quick settings causes a firmware crash.                                                                                                                                                                                                   | 888575  |
| The new grids in the Time Plan are only available for the first frame                                                                                                                                                                                                 | 922048  |

|                  |                                                                                                                                                                                                                                                                       |         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                  | Time Domain Resource Assignment should be 4 Bits for DCI 0_0                                                                                                                                                                                                          |         |
|                  | Errors while activating feedback mode for coupled per entity system configurations.                                                                                                                                                                                   | 554021  |
|                  | Missing adjustments for blocks >2 when loading a global safe-file.                                                                                                                                                                                                    | 952638  |
|                  | PxSCH DMRS without data == 2 not correctly visualized in time plan.                                                                                                                                                                                                   | 839260  |
|                  | Unexpected restart due to inconsistent CSI-RS data.                                                                                                                                                                                                                   | 901318  |
|                  | In Advanced System Configurations, if the number of entities is higher than 2 and the BB Source Config is set to Separate Sources, setting the baseband trigger source to External Global Trigger 2 might fail with the device showing a corresponding error message. | 929549  |
|                  | In higher order MIMO configurations, retriggering the baseband while a 5G signal is generated with real time mode ON results in a signal distortion for some seconds.                                                                                                 | 929549  |
|                  | K145 + K81: Firmware crashes on system configuration change with both K145 and K81 logging activated                                                                                                                                                                  | 917109  |
|                  | O-RAN TMs 3.2.3.7.4 & 3.2.5.7.4 10MHz not configured correctly                                                                                                                                                                                                        | 901181  |
|                  | O-RAN: TC 3.2.3.1.3 for 20MHz 30kHz does not occupy entire bandwidth                                                                                                                                                                                                  | 944151  |
|                  | Power Leveling for Count Full System Frame Number SSPBCH mode does not work with advanced power modes                                                                                                                                                                 | 906070  |
|                  | Save Recall: Old Save Recall Files cause problems in Scheduling Symbol Offset created with versions up to C45.4.70.128.50.20 beta / Nov. 2020 beta.                                                                                                                   | 947736  |
|                  | SCPI: some SCPI commands ending with a number could be misunderstood.                                                                                                                                                                                                 | 908607  |
|                  | Settings Transfer: Creating a transfer file with two active PDSCH codewords is broken and creates an error message.                                                                                                                                                   | 926151  |
|                  | Using K175 with bwp-offset settings creates invalid u-plane data                                                                                                                                                                                                      | 934488  |
| Test Case Wizard | Display wrong connectors for the HARQ in case of B9 for TC 8.2.5.                                                                                                                                                                                                     | 982743  |
|                  | RB offset is not correct for both MUE and SUE for TC 8.2.5.                                                                                                                                                                                                           | 965974  |
|                  | The second AWGN should be turned off for TC 8.2.5.                                                                                                                                                                                                                    | 982744  |
|                  | TCW should allow the user to configure the same frequency range as the connected front end                                                                                                                                                                            | 970823  |
|                  | The SNR should be corrected according to specification for TC 8.2.5                                                                                                                                                                                                   | 986960  |
|                  | Interfering RB Center Frequency of TC 742B is not updated when SCS of WS changed.                                                                                                                                                                                     | 895624  |
|                  | TC 8.2.5 is not available on wideband devices with scenario X.                                                                                                                                                                                                        | 891680  |
| Downlink         | Configuring SS/PBCH for FR2-2 gets wrong SCS/CP.                                                                                                                                                                                                                      | 966835  |
|                  | Copy Carrier with selected Test Model in the Quick Settings does not copy the cell id correctly.                                                                                                                                                                      | 973765  |
|                  | Coreset: Firmware can create an internal error for specific interleaved settings.                                                                                                                                                                                     | 937435  |
|                  | Creating a transfer file with number of layers set to 7 or 8 causes an error.                                                                                                                                                                                         | 950569  |
|                  | CSI-RS configuration out of BWP range results in internal std::bad_alloc error message.                                                                                                                                                                               | 952566  |
|                  | CSI-RS NZP: Too few bits are configurable for row 17 and row 18                                                                                                                                                                                                       | 1008291 |

|                  |                                                                                                                                                                                                                                                                                                           |         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                  | Auto Dci: Rel-15 PDSCH DMRS is generated even though dmrsDownLink-R16 is ON.                                                                                                                                                                                                                              | 939932  |
|                  | NR PDSCH coding uses wrong RNTI when configured by a CORESET                                                                                                                                                                                                                                              | 936382  |
|                  | PDSCH Type configuration restrictions are too restrictive.                                                                                                                                                                                                                                                | 902268  |
|                  | AutoDCI: Incorrect number CDM groups without data for antenna port index 23.                                                                                                                                                                                                                              | 945505  |
|                  | Coreset: Firmware can create an internal error for specific interleaved settings.                                                                                                                                                                                                                         | 937435  |
|                  | Coreset: Restrict to search space mode calculates incorrect CCE indexes for frame index bigger than 1.                                                                                                                                                                                                    | 912160  |
|                  | CSI-RS configuration out of BWP range results in internal std::bad_alloc error message.                                                                                                                                                                                                                   | 952566  |
|                  | GUI display error in NZP CSI-RS Antenna Port Table.                                                                                                                                                                                                                                                       | 945334  |
|                  | When generating PDSCH through DCI 1_0 using P-RNTI, MsgB-RNTI, RA-RNTI, the redundancy version used might be wrong.                                                                                                                                                                                       | 937429  |
|                  | A pdsch scheduled by a CORESET always uses cellID for the PDSCH DMRS scrambling Ids regardless of scramblingId0/scramblingId1 set in DL BWP Config. This contradicts 38.211, clause 7.4.1.1.1 which requires the scrambling Id to be set depending on dci usage, dci format and set cellID/scramblingIds. | 945811  |
| Uplink           | 1024QAM not selectable without channel coding                                                                                                                                                                                                                                                             | 951948  |
|                  | Copy Carrier with selected Test Model in the Quick Settings does not work for O-RAN Test Models.                                                                                                                                                                                                          | 966512  |
|                  | FRC: Some values on the FRC tab are not stored and might be wrong after save/recall                                                                                                                                                                                                                       | 947865  |
|                  | GUI does not update the IMCS correctly by switching USCH Channel Coding ON                                                                                                                                                                                                                                | 963038  |
|                  | 1024QAM not selectable without channel coding                                                                                                                                                                                                                                                             | 951948  |
|                  | PUCCH Format3 and Format4 polar coding might be wrong for some configurations (e.g. some payload sizes)                                                                                                                                                                                                   | 940867  |
| <b>EUTRA/LTE</b> |                                                                                                                                                                                                                                                                                                           |         |
|                  | LTE: 3MHz and 5MHz PBSCH mapping for DMRS is fixed for sidelink.                                                                                                                                                                                                                                          | 1015750 |
|                  | EUTra: ORAN State was not stored.                                                                                                                                                                                                                                                                         | 979836  |
|                  | Calculation of the NID1 is fixed.                                                                                                                                                                                                                                                                         | 1014576 |
|                  | SCPI fixes for RBCount and VRBoffset.                                                                                                                                                                                                                                                                     | 1014079 |
|                  | Oran-Models are not correctly shown on path B, TDD/FDD is not considered correctly                                                                                                                                                                                                                        | 911352  |
| <b>GNSS</b>      |                                                                                                                                                                                                                                                                                                           |         |
|                  | BeiDou B1I and B3I almanac reference time may be wrong if satellite PRN 1 is excluded from simulated constellation                                                                                                                                                                                        | 988474  |
|                  | BeiDou ephemeris partly inaccurate for 3GPP scenario EUTRA/LTE Performance 2 ST11                                                                                                                                                                                                                         | 981856  |
|                  | Certain values for GPS-UTC time offset drift (A1) lead to unreasonably high inter-system time offsets                                                                                                                                                                                                     | 994010  |
|                  | Enable generation of almanacs for BeiDou satellites with PRNs >30 at B1I signal                                                                                                                                                                                                                           | 987912  |

|               |                                                                                                                                                                                      |         |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|               | Galileo F/NAV: prevent overflow within almanac message generation leading to SVIDs>36 coded into the message data                                                                    | 952012  |
|               | Galileo to GPS offset (GGTO) handling for invalid value is not correct                                                                                                               | 890049  |
|               | Inconsistencies in movement dynamics in case of cyclic mode without smoothing at trajectory crossover point.                                                                         | 567203  |
|               | Removed badly designed last position sample from Munich_Car_Motion.txt example trajectory.                                                                                           | 566842  |
|               | Transmitted values for AODE and AODC values in Beidou B1I message may not be consistent with values configured via GUI                                                               | 987755  |
|               | GPS LNav IODE may be not correctly synchronized to LSBs of IODC when initially using higher IODC values and non-current ephemeris                                                    | 956343  |
|               | Some Glonass satellites under certain conditions not usable within receiver PVT solution when simulation runs continuously for more than 12h                                         | 672947  |
|               | Glonass satellites rising only after a leap second event happened in a running simulation may not be usable                                                                          | 906604  |
|               | Incorrect constellation for GLONASS satellites after leap second event                                                                                                               | 906399  |
|               | The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                   | 429406  |
|               | Glonass satellites which are not enabled in simulated constellation (i.e. not simulated at all) are still included with valid almanac data within the FDMA signal navigation message | 922245  |
|               | Decimal point for satellite orbit parameter "Eccentricity" cannot be changed correctly from GUI                                                                                      | 935886  |
|               | Change default broadcast URA value for GPS satellites from 5 to 0                                                                                                                    | 556689  |
|               | Inconsistent naming of power/phase in GUI of antenna pattern / body mask                                                                                                             | 931114  |
|               | Typo in minimum value of "System Latency" (2ms instead of 20ms)                                                                                                                      | 954515  |
| <b>GBAS</b>   |                                                                                                                                                                                      |         |
|               | Certain SCPI commands for timeslot settings (power, state) are not displayed in 'Show SCPI command' dialogue.                                                                        | 915844  |
|               | Value out of range (IdPDbGbasAllocateTbCrt) error message in Allocation tap by using 8 transmitters                                                                                  | 916267  |
|               | Wrong pseudorange correction value in message type 1 (SCAT)                                                                                                                          | 916495  |
|               | Changing frequency number (allocation of the VDB transmitters) not working via SCPI.                                                                                                 | 916525  |
|               | Wrong response of differential file query in SCAT mode.                                                                                                                              | 921144  |
|               | Wrong SCAT specification reported in version query.                                                                                                                                  | 921146  |
| <b>802.11</b> |                                                                                                                                                                                      |         |
|               | 802.11b: Incorrect output power for low duty cycles                                                                                                                                  | 997428  |
|               | 802.11be: EHT-LTF not correct in some cases with enabled preamble puncturing                                                                                                         | 1017654 |
|               | 802.11be: incorrect processing of null carriers for small MRUs.                                                                                                                      | 965596  |
|               | added non-OFDMA DL MU-MIMO                                                                                                                                                           | 911554  |
|               | Possible firmware crash when activating time domain windowing                                                                                                                        | 911014  |
|               | added max PE duration of 20us                                                                                                                                                        | 911570  |
|               | 802.11ac: Frame type Trigger not working correctly.                                                                                                                                  | 945603  |

|                  |                                                                                          |         |
|------------------|------------------------------------------------------------------------------------------|---------|
|                  | 802.11be: incorrectly calculated PE disambiguity bit in some cases                       | 1023250 |
|                  | 802.11be: incorrect processing of null carriers in trigger-based 160MHz                  | 1020057 |
|                  | 802.11be: partly incorrect duplication of EHT-SIG content channels to 20MHz subblocks    | 946735  |
|                  | 802.11be: encoding issues with MCS14 and MCS15, incorrect scrambling of payload data     | 965587  |
|                  | 802.11be: incorrect constellation mapping to second 996 RU for EHT-160                   | 966620  |
| <b>HWP-UWB</b>   |                                                                                          |         |
|                  | Display of Mean PRF value is fixed in HPRF mode.                                         | 958974  |
|                  | Fix for Data Length.                                                                     | 952104  |
|                  | Fix for Database settings.                                                               | 999851  |
|                  | Fixes for different Chips per burst and hop burst combinations.                          | 898437  |
|                  | GUI label state for Impairments tab is fixed.                                            | 1009364 |
|                  | Heap Fixes for CRC Append.                                                               | 968937  |
|                  | MAC FCS 4 fixed for different hop burst and chip burst configuration.                    | 898039  |
|                  | Power is fixed for different oversampling values.                                        | 1002624 |
|                  | Power level is fixed in BPRF mode for STS configuration 1.                               | 1014838 |
|                  | Power level is fixed.                                                                    | 983775  |
|                  | Remote control command fix for Signal Duration Unit.                                     | 1002728 |
|                  | STS fixes without payload.                                                               | 914827  |
|                  | Trigger is fixed for oversampling factors other than one.                                | 972105  |
|                  | Trigger Length calculation is fixed in BPRF mode.                                        | 1019503 |
|                  | Frequency offset in Impairments works for different Oversampling factors.                | 909774  |
|                  | Power fixed for higher payload Lengths                                                   | 1025032 |
|                  | Channel Number is added instead of Channel Num.                                          | 912942  |
|                  | Fixes for Pattern in Datasources.                                                        | 887252  |
| <b>Bluetooth</b> |                                                                                          |         |
|                  | Signal peaks during guard time for some EDR packets                                      | 933761  |
|                  | Measured guard time only ~4.5us for EDR packets on SMW and SMBVB internal generators     | 919953  |
|                  | Signal peaks during guard time for some EDR packets                                      | 933761  |
| <b>DME</b>       |                                                                                          |         |
|                  | Enabled echo simulation also for Pulse squitter                                          | 945363  |
|                  | DME analysis could crash when stopping and starting the measurement thread several times | 1011252 |

### Known Issues

|                                                         |        |
|---------------------------------------------------------|--------|
| Baseband selftest sometimes shows errors concerning DSP | 902551 |
|---------------------------------------------------------|--------|

|                                                               |                                                                                                                                                  |         |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| S-Parameter not used in Fill User Correction Data With Sensor |                                                                                                                                                  | 1021049 |
| <b>ARB</b>                                                    |                                                                                                                                                  |         |
|                                                               | Filenames containig special characters (non ASCII), cannot be selected                                                                           | 1008640 |
| <b>DME</b>                                                    |                                                                                                                                                  |         |
|                                                               | An unsucessfull search for a trigger level using the NRP-Z81 power meter, resulted in a very low trigger level that causes random trigger events | 1028073 |
| <b>GNSS</b>                                                   |                                                                                                                                                  |         |
|                                                               | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.                          | 498094  |
|                                                               | If start time is just before leap second insertion, the insertion might be omitted in log files.                                                 | 652559  |
| <b>x</b>                                                      | Inconsistencies in logging data for SBAS.                                                                                                        | 491788  |
|                                                               | Issue with smoothing of trajectories                                                                                                             | 466593  |

## 1.7 Version 5.00.044.51

Released: July 2022

### New Options

R&S® SMBVB-K423 MODERNIZED GLONASS with R&S®WinIQSIM2

R&S® SMBVB-K470 5G NR SIDELINK with R&S®WinIQSIM2

R&S® SMBVB-K471 5G NR RELEASE 17 with R&S®WinIQSIM2

### New Functionality / Changed Behavior

None

### Fixed Issues

#### RF

Level Range shows wrong values if RF is off

943629

#### Phase Modulation



|                 |                                                                                                            |        |
|-----------------|------------------------------------------------------------------------------------------------------------|--------|
|                 | Deviation of Path 2 is not set correctly                                                                   | 944326 |
|                 | Settings Conflict " frequency vs. deviation vs. modulation mode" is shown for wrong deviation below 80 MHz | 979341 |
| <b>Baseband</b> |                                                                                                            |        |
|                 | Wrong or no IQ signal on rare occasions at high surrounding temperatures                                   | 937582 |
| <b>ARB</b>      |                                                                                                            |        |
|                 | Not possible to set number of samples for AWGN test signal                                                 | 907256 |
| <b>GNSS</b>     |                                                                                                            |        |
|                 | Multi-instrument trigger not working with GNSS                                                             | 960533 |

## 1.8 Version 5.00.044.43

Released: March 2022

### New Options

R&S® SMBVB-K122 RTK VIRTUAL REF. STATION

### New Functionality / Changed Behavior

#### 5G New Radio

|                |                                                                                         |        |
|----------------|-----------------------------------------------------------------------------------------|--------|
| <b>General</b> | The frequency range FR2 are divided into FR2-1 and FR2-2                                | 865401 |
|                | Possible 200 configurable users.                                                        | 819533 |
|                | Provide O-RAN TM configurations for 3.2.5.1.X and 3.2.3.1.X                             | 815386 |
|                | Quick Settings and Marker: Support IAB slot formats according to release 16.            | 785344 |
|                | Quick Settings: More flexibility for special slot in TDD mode                           | 831399 |
|                | Synchronize Quick Settings to Marker's TDD Mode.                                        | 849631 |
|                | xOverhead for transport block size determination                                        | 879622 |
|                | O-RAN: General: Provide O-RAN.CONF0 3.2.3.1.X and 3.2.5.1.X support for BW >= 20MHz     | 876115 |
|                | O-RAN: General: Provide O-RAN.CONF0 3.2.3.7.X                                           | 866243 |
|                | Time Plan: X- and Y-axis description cannot show slots/symbol and subcarrier/RB in axes | 849736 |

|                                                                                        |                                                                                                                                                                            |                                                                      |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>Downlink</b>                                                                        | Add IAB-MT reference measurement channels                                                                                                                                  | 864231                                                               |
|                                                                                        | Additional SSPBCH Occasions.                                                                                                                                               | 774527                                                               |
|                                                                                        | Closed-loop HARQ K145 now also for PDSCH                                                                                                                                   | 800423                                                               |
|                                                                                        | Extend PBCH scrambling and payload generation for access to unlicensed spectrum.                                                                                           | 774511                                                               |
|                                                                                        | Implement transport block scaling factor S.                                                                                                                                | 863922                                                               |
|                                                                                        | K148: Increase number of configurable DCIs to 32.                                                                                                                          | 866826                                                               |
|                                                                                        | New SSB periodicities for IAB                                                                                                                                              | 819201                                                               |
|                                                                                        | RMCs for FR2 according to 38.521-2                                                                                                                                         | 864358                                                               |
|                                                                                        | Type 1 Single Panel Codebook Precoding                                                                                                                                     | 724742                                                               |
|                                                                                        | Some release 16 updates to DCI type 2_0.                                                                                                                                   | 832345                                                               |
|                                                                                        | <b>Uplink</b>                                                                                                                                                              | Add R16 OCC length and index configuration for PUCCH format 2 and 3. |
| Closed-loop HARQ K145 now also for PUSCH aggregation.                                  |                                                                                                                                                                            | 833844                                                               |
| IAB-DU reference measurement channels                                                  |                                                                                                                                                                            | 793740                                                               |
| Optional Cyclic Prefix Extension for PUSCH and PUCCH.                                  |                                                                                                                                                                            | 774498                                                               |
| PRACH sequence lengths 571 and 1151 for unlicensed spectrum                            |                                                                                                                                                                            | 774505                                                               |
| PUSCH allocation can be shifted in time (needed for 2-step-RACH BS conformance tests). |                                                                                                                                                                            | 745720                                                               |
| Support for additional FRCs according to recent versions of 3GPP TS 38.141.            |                                                                                                                                                                            | 762540                                                               |
| Support for PUCCH interlace                                                            |                                                                                                                                                                            | 774507                                                               |
| Support for PUSCH interlace with allocation type 2                                     |                                                                                                                                                                            | 774497                                                               |
| <b>Test Case Wizard</b>                                                                | Now the TCW sets the system config mode Analog & Digital (HS) in case of B13XT SMWs, which makes it optionally possible to connect instruments by means of 40G digital IQ. | 832367                                                               |
|                                                                                        | Support for release 16 up to v16.7.0.                                                                                                                                      | 750672                                                               |
|                                                                                        | Support instrument setup for using one or two RF port for OTA chapter 7.                                                                                                   | 740801                                                               |
| <b>Setting Transfer</b>                                                                | Support allocation type 0.                                                                                                                                                 | 869280                                                               |
|                                                                                        | Support coreset Allow PDSCH mode.                                                                                                                                          | 878228                                                               |

| <b>EUTRA/LTE</b> |                                                                                                                 |        |
|------------------|-----------------------------------------------------------------------------------------------------------------|--------|
| <b>General</b>   | Marker delay is additionally displayed in time units.                                                           | 761883 |
|                  | Renamed DRS to DMRS where demodulation reference symbols are meant.                                             | 521452 |
|                  | Starting seed of PN sequences is configurable.                                                                  | 846389 |
| <b>HRP-UWB</b>   |                                                                                                                 |        |
|                  | FCS support for 2 and 4 Octets.                                                                                 | 812490 |
|                  | Filter for 15.4z supported.                                                                                     | 847459 |
|                  | Frame Length is added in Frame Configuration.                                                                   | 817166 |
|                  | Maximum Idle Interval is one second.                                                                            | 855484 |
|                  | Payload Lengths 1023,2047 and 4095 are available in HPRF Mode.                                                  | 811167 |
|                  | Channel Number and Code Index are taken as 9.                                                                   | 849071 |
| <b>GNSS</b>      |                                                                                                                 |        |
|                  | Beidou: Support of up to 63 Satellites                                                                          | 867771 |
|                  | Enable reading of RINEX 3.05 navigation message files                                                           | 866552 |
|                  | GNSS supports GPS L1C                                                                                           | 817299 |
|                  | Added Button to adjust repetition window of obstacles to trajectory length.                                     | 758535 |
|                  | Satellite Logging now provides Carrier Range [m] instead of Carrier Phase [deg].                                | 848746 |
|                  | Transmitted default Galileo SISA index value of 5 is not realistic with respect to the SIS, value was increased | 873345 |
|                  | Import pseudorange error profiles from file                                                                     | 833206 |
|                  | Allow old P101 SCPI Commands in SMBV100B when GPS, GAL, GLO, BD Options are Installed                           | 835292 |

### Fixed Issues

#### Common

|                                                                 |        |
|-----------------------------------------------------------------|--------|
| Wrong level range for RF OFF and RF OFF Mode = Full Attenuation | 943629 |
|-----------------------------------------------------------------|--------|

|                                                                                                                                                                                                                                            |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Permanent options that are also activated with the trial are displayed with the trial's expiry date.                                                                                                                                       | 870611 |
| LF generator: The rise time of output 2 does not change.                                                                                                                                                                                   | 848433 |
| Activation of DME leads to wrong ALC setting (Table & Off)                                                                                                                                                                                 | 938619 |
| <b>Baseband</b>                                                                                                                                                                                                                            |        |
| Bluetooth: Allow test packets with 0 bytes payload length for all packet formats.                                                                                                                                                          | 878035 |
| The Generate Waveform function of baseband standards fails to create a waveform file when parameters are changed before the waveform calculation has finished.                                                                             | 880043 |
| <b>5G New Radio</b>                                                                                                                                                                                                                        |        |
| <b>General</b>                                                                                                                                                                                                                             |        |
| Changing the configuration of one baseband path can re-arm the other baseband path.                                                                                                                                                        | 843850 |
| some parameters are not included in the generators' SCPI export.                                                                                                                                                                           | 886923 |
| Progress bar does not show up for long signal calculations.                                                                                                                                                                                | 891801 |
| new timeplan axis was not correctly scaled in some conditions, i.e. subcarrier spacing was not considered correctly                                                                                                                        | 888409 |
| Slot Format Index 1 or 2 in quick settings causes a firmware crash.                                                                                                                                                                        | 888575 |
| Oran datalist files are not updated.                                                                                                                                                                                                       | 856241 |
| Allocation type 0 is allowed although transform precoding is enabled.                                                                                                                                                                      | 879309 |
| for some channel bandwidths, a PRACH allocation could require more RBs than what is available in the BWP                                                                                                                                   | 855328 |
| Fix settings transfer for FR2+                                                                                                                                                                                                             | 853541 |
| Min mode sample rate does not result in full sample cyclic prefix.                                                                                                                                                                         | 832872 |
| Possible issues with old savefiles when loading more carriers with deployment FR2.                                                                                                                                                         | 843953 |
| Quick Settings: No SCPI for modulation type pi/2 available.                                                                                                                                                                                | 825524 |
| Generate waveform with active closed loop feedback produces an error message.                                                                                                                                                              | 550015 |
| Settings File Transfer: Incorrect default value for Scaling factor S                                                                                                                                                                       | 855945 |
| Time Plan: x-axis does not zoom correctly in grid fine and coarse mode.                                                                                                                                                                    | 877783 |
| SMW might freeze when setting DCI usage to P-RNTI                                                                                                                                                                                          | 898416 |
| UL PTRS MIMO: Codebook with fully-coherent restricts the PTRS mapping to first DMRS port                                                                                                                                                   | 883568 |
| UL PTRS MIMO: PTRS AP does not include muted PTRS RE from other PTRS port and PT-RS power issue for MIMO PT-RS                                                                                                                             | 885519 |
| Time domain resource assignment bit in CORESET is mostly only 1 bit for user 1 (instead of 4)                                                                                                                                              | 898411 |
| Timeplan: axis scaling (grid coarse and fine) does not consider Subcarrier spacing correctly                                                                                                                                               | 887853 |
| <b>Test Case Wizard</b>                                                                                                                                                                                                                    |        |
| Generally using 'Analog & Digital HS' mode on B13XT SMWs prevents using SGTs..For the next release we can call it a new feature: 5GNR: Test Case Wizard: Support for mode 'Analog & Digital HS' in the test case wizard (B13XT SMWs only). | 837601 |

|                  |                                                                                                                                                                                      |        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                  | SNR is not correct for 38.141-1:TC73 Dynamic Range and 38.141-2:TC74 OTA Dynamic Range.                                                                                              | 846999 |
|                  | Incorrect RB offset of interfering signal of 7.4.2B in lower frequency                                                                                                               | 826900 |
|                  | Interfering RB Center Frequency of TC 742B is not updated when SCS of WS changed.                                                                                                    | 895624 |
| <b>Downlink</b>  | DCI field Precoding Information and Number of Layers in DCI 0_1 and 0_2 could have an erroneous width in the case of SRS resources configured with different number of antenna ports | 828830 |
|                  | SRI field width in DCI 0_1 and 0_2 could be erroneous                                                                                                                                | 828819 |
|                  | Time Plan shows conflict while both PRS and OCNG are ON                                                                                                                              | 844366 |
|                  | FR2: RMC TBSIZE and nPhysBits for 64QAM and 256QAM are not correct. The numbers do not match 38.521-2.                                                                               | 888495 |
| <b>Uplink</b>    | Oran testmodels are not written into settings transfer file.                                                                                                                         | 861104 |
|                  | K145 SRS: SRS in Feedback Mode does not work.                                                                                                                                        | 867674 |
|                  | PUCCH: Format 0 does not support 0 ACK bits in case of active scheduling request.                                                                                                    | 825783 |
|                  | PUSCH Interface: Transport Block calculation does not take into account interlacing                                                                                                  | 859573 |
|                  | Several PTRS configurations cannot be mapped with only one SRS-PTRS Port Idx configuration.                                                                                          | 828315 |
|                  | the number of RBs shown in the scheduling table for PRACH allocations with certain configurations could be wrong                                                                     | 857381 |
| <b>EUTRA/LTE</b> |                                                                                                                                                                                      |        |
| <b>General</b>   | Error in TxDiversity is shown under certain conditions.                                                                                                                              | 852923 |
|                  | For some rarely used parameters, a value change could possibly not trigger a signal recalculation.                                                                                   | 769627 |
|                  | In case of carrier aggregation, an invalid sample rate can be configured, which causes a crash.                                                                                      | 624353 |
|                  | Some unlogical GUI behavior around the special subframe configs of newer specification releases.                                                                                     | 540121 |
|                  | Wrong delta-f limits for some system configurations.                                                                                                                                 | 730341 |
|                  | O-RAN: Activating U-Plane generation does not re-trigger signal calculation and accordingly creates no files                                                                         | 849186 |
| <b>Downlink</b>  | DCI 1A mode PRACH does not work.                                                                                                                                                     | 674649 |
|                  | Problems with Release DCI while configuring and recalling SPS settings.                                                                                                              | 732688 |
| <b>GNSS</b>      |                                                                                                                                                                                      |        |
|                  | Beidou B2a signal in rare circumstances not usable for PVT                                                                                                                           | 800292 |
|                  | Satellite handover fails in rare cases at B10                                                                                                                                        | 849465 |
|                  |                                                                                                                                                                                      |        |
|                  | Show SCPI command... is displaying wrong command when used for Ionosphere parameters of GPS/LNAV, Galileo/INAV, Beidou/DNAV, QZSS/NAV                                                | 780975 |
|                  | Wrong satellite initialization leading to potential tracking errors for single satellites in some rare cases                                                                         | 856280 |

|                |                                                                                                                                                |        |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                | C/Nav navigation data may be inconsistent with respect to L/Nav navigation data when importing RINEX files                                     | 880465 |
|                | Galileo almanac entries for satellites which are not present in the utilized constellation are not indicated with SVID = 0                     | 893456 |
|                | Galileo health flag not utilized from RINEX import                                                                                             | 806109 |
|                | Galileo I/NAV some reserved/spare words are not indicated as a word 0                                                                          | 865279 |
|                | Galileo satellites in some cases experience almanac vs. ephemeris mismatch when preceding Galileo satellites are not existing in constellation | 893985 |
|                | Some satellites related SMBV100A SCPI commands (SVID, DSHift, FNUMBER) are not emulated well in SMBV100B                                       | 844296 |
|                | No positioning solution for GPS L1/L5 when simulations start at dedicated points in time                                                       | 855609 |
| <b>802.11</b>  |                                                                                                                                                |        |
|                | 802.11ax: some HE-160 trigger based PPDU configurations crash                                                                                  | 845722 |
|                | 802.11be: Filter settings cannot be changed in 20MHz.                                                                                          | 896821 |
| <b>HRP-UWB</b> |                                                                                                                                                |        |
|                | Hop Bursts 8 and 32 are added in BPRF mode.                                                                                                    | 848583 |
|                | Issue fix for BPRF- DRBM_HP PHR Data rate Mode.                                                                                                | 847495 |
|                | Issue for SFD = 0 in BPRF mode.                                                                                                                | 833183 |

## Known Issues

### GNSS

|  |                                                                                                                         |        |
|--|-------------------------------------------------------------------------------------------------------------------------|--------|
|  | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed. | 498094 |
|  | If start time is just before leap second insertion, the insertion might be omitted in log files.                        | 652559 |
|  | Inconsistencies in logging data for SBAS.                                                                               | 491788 |
|  | Issue with smoothing of trajectories                                                                                    | 466593 |
|  | The body mask and antenna pattern editors assume a flipped direction of the z-axis                                      | 429406 |
|  | Possible Ionospheric simulations mismatch                                                                               | 762298 |

## 1.9 Version 4.90.049.56

Released: October 2021

### New Options

R&S® SMBVB-K525 Baseband Extension to 1 GHz RF bandwidth

### Fixed Issues

#### Baseband

|                 |                                                |        |
|-----------------|------------------------------------------------|--------|
|                 | Spurious occur sporadically on baseband signal | 870983 |
| <b>Digi I/Q</b> |                                                |        |
|                 | Connection fails                               | 831137 |

### Known Issues

#### GNSS

|  |                                                                                                                                                                                                                                                                                                                                                     |        |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.                                                                                                                                                                                                                             | 498094 |
|  | If start time is just before leap second insertion, the insertion might be omitted in log files.                                                                                                                                                                                                                                                    | 652559 |
|  | Inconsistencies in logging data for SBAS.                                                                                                                                                                                                                                                                                                           | 491788 |
|  | Issue with smoothing of trajectories                                                                                                                                                                                                                                                                                                                | 466593 |
|  | SBAS 'Generate Correction Data Automatically' does not correctly sync with the simulated ionosphere and GPS orbit/clock errors leading to an error of few meters in the position calculated by the receiver when using the SBAS correction service. Instead the 'Replay Historical Data and Sync Atmosphere & SV errors' can be used at the moment. | 240388 |
|  | The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                                                                                                                                                                                  | 429406 |
|  | Possible Ionospheric simulations mismatch                                                                                                                                                                                                                                                                                                           | 762298 |

#### DIGIQ\_SYSCONF

|  |                                                                                                                              |        |
|--|------------------------------------------------------------------------------------------------------------------------------|--------|
|  | DIG I/Q: Connected Device Name (IN/OUT) might be wrong, HS DIG I/Q: When start IQW streaming, BBin needs state OFF/ON again. | 830116 |
|--|------------------------------------------------------------------------------------------------------------------------------|--------|

## 1.10 Version 4.90.049.45

Released: July 2021

| New Options                                      |
|--------------------------------------------------|
| R&S® SMBVB-K147 IEEE 802.11BE                    |
| R&S® SMBVB-K447 IEEE 802.11BE with R&S®WinIQSIM2 |
| R&S® SMBVB-K175 U-PLANE GENERATION               |
| R&S® SMBVB-K811 NOTCHED SIGNALS                  |

| New Functionality / Changed Behavior                                     |                                                                                                                                                       |        |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Custom Dig Mod</b>                                                    |                                                                                                                                                       |        |
|                                                                          | GSM Coding not supported                                                                                                                              | 829914 |
| <b>5G New Radio</b>                                                      |                                                                                                                                                       |        |
| <b>General</b>                                                           | Dummy Data serves OCNB definition of 3GPP TS 38.521.                                                                                                  | 720502 |
|                                                                          | Dummy Data supports precoding matrix                                                                                                                  | 720502 |
|                                                                          | PDSCH, PUSCH, PUCCH: Support release 16 DMRS.                                                                                                         | 724635 |
|                                                                          | Possibility to store the 5GNR configuration in a file which can be imported by the 5G NR functionality of Rohde&Schwarz signal or spectrum analyzers. | 684698 |
|                                                                          | Quick Settings: Copy Carrier usable for Settings Transfer                                                                                             | 784812 |
|                                                                          | Add per carrier phase-shift for multi carrier setups                                                                                                  | 782352 |
|                                                                          | Add per carrier time-shift (< 1ms) for multi carrier setups                                                                                           | 767366 |
|                                                                          | Add toggle for disabling scrambling in PDSCH and PUSCH.                                                                                               | 786052 |
|                                                                          | Carrier signals can be cyclically shifted by subframes.                                                                                               | 790660 |
|                                                                          | For marker type TDD UL/DL, the rise and fall offsets can be configured.                                                                               | 761653 |
|                                                                          | Further speedup of the signal calculation.                                                                                                            | 825114 |
|                                                                          | Increased number of independently configurable subframes.                                                                                             | 781290 |
|                                                                          | Marker delay is additionally displayed in time units.                                                                                                 | 761652 |
|                                                                          | Markers: Add "active high" / "active low" selection to invert marker signal.                                                                          | 762926 |
| Optionally, the PDSCH/PUSCH target code rate can be configured manually. | 754714                                                                                                                                                |        |



|                 |                                                                                                                                        |        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------|--------|
|                 | O-RAN test models.                                                                                                                     | 799001 |
|                 | Release 15 option has been renamed for harmonization.                                                                                  | 816536 |
|                 | Support of the release 16 UL full power transmission modes (SRS and DCI).                                                              | 806317 |
|                 | Update to 3GPP specifications 38.211 V16.4.0, 38.212 V16.4.0, 38.213 V16.4.0, 38.214 V16.4.0. Test models according to 38.141 V16.6.0. | 823042 |
| <b>Downlink</b> | Possibility to apply a test model to multiple carriers (by means of Quick Settings).                                                   | 720514 |
|                 | Support for TS 38.521 RMC assistance functionality.                                                                                    | 720513 |
|                 | Additional PDSCH DMRS durations with option K148                                                                                       | 774512 |
|                 | Additional PDSCH Type B symbol lengths with option K148                                                                                | 774513 |
|                 | Auto-DCI: Release 16 PDSCH Type B symbol lengths and DMRS positions                                                                    | 798674 |
|                 | Create PDSCH for DCI 1_2                                                                                                               | 750928 |
|                 | DCI formats 0_0, 0_1, 0_2, 1_0, 1_1, 1_2, 2_0 (partly), 2_1, 2_2, 2_3, 2_4, 2_5, 2_6 are updated / created according to release 16.    | 824884 |
|                 | Default SRS Request field width in DCI 1_2 changed according to the related higher layer parameter                                     | 801642 |
|                 | Display DMRS symbols in CORESET for DCI1_x after "Create PDSCH"                                                                        | 809007 |
|                 | Generate U-Plane Data for given configuration (K175 needed).                                                                           | 767865 |
|                 | New PDSCH type "DCI Format 1_2"                                                                                                        | 723892 |
|                 | RNTI type "custom".                                                                                                                    | 790880 |
|                 | Settings transfer: Add DCI usage and format to transferred settings                                                                    | 788778 |
|                 | Support for 38.141-2 FR2 NR-TM 2a and 3.1a.                                                                                            | 750671 |
|                 | Support for AI-RNTI and DCI 2_5.                                                                                                       | 748930 |
|                 | Support for DCI format 0_2.                                                                                                            | 750930 |
|                 | Support for DCI format 1_2.                                                                                                            | 755818 |
|                 | Support for new antenna port tables in auto DCI mode with format 1_1                                                                   | 782493 |
|                 | Support multiple lte-crs rate match patterns, according to release 16.                                                                 | 750495 |
|                 | Type 1 frequency allocation with granularity larger than 1 for DCI format 1_2                                                          | 811550 |
| <b>Uplink</b>   | Support release 16 SRS                                                                                                                 | 725527 |

|                         |                                                                                                                       |        |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------|--------|
|                         | New PUSCH type "DCI Format 0_2"                                                                                       | 750933 |
|                         | Support for additional FRCs except new FRCs defined in A.4 according to recent versions of 3GPP TS 38.141.            | 750670 |
| <b>EUTRA/LTE</b>        |                                                                                                                       |        |
| <b>General</b>          | Marker delay is additionally displayed in time units.                                                                 | 761883 |
| <b>Test Case Wizard</b> | Support for newer releases.                                                                                           | 732520 |
| <b>Downlink</b>         | Generate U-Plane Data for given configuration (K175 needed).                                                          | 759648 |
| <b>Uplink</b>           | FRCs A.21, A.22.                                                                                                      | 508595 |
| <b>HRP-UWB</b>          |                                                                                                                       |        |
|                         | "Symbol timing Error" is replaced with "Chip Clock Error" in Impairments.                                             | 808096 |
|                         | Configurable MAC Header.                                                                                              | 781438 |
|                         | Flexible configuration of sync lengths.                                                                               | 779506 |
|                         | Gap Configuration is supported between Payload and STS.                                                               | 808104 |
|                         | SFD values are flexible in BPRF and HPRF mode.                                                                        | 815894 |
|                         | Support for flexible STS active segment lengths and number of active segments                                         | 781354 |
|                         | Support for Flexible STS Active Segment Lengths.                                                                      | 789311 |
|                         | Support of up to 4096 octets for HPRF payload.                                                                        | 791465 |
|                         | Oversampling factors 3 to 8 are supported.                                                                            | 790062 |
|                         | The Maximum Value of Idle interval is 10ms.                                                                           | 821654 |
| <b>GNSS</b>             |                                                                                                                       |        |
|                         | Improved antennas position visualization                                                                              | 596054 |
|                         | Support for Assisted-GNSS logging                                                                                     | 762436 |
|                         | New experimental SBAS Signal Exp L5: WAAS L1 signal and EGNOS L1 signal on L5 carrier (not compliant to SBAS L5 ICDs) | 743973 |
| <b>802.11</b>           |                                                                                                                       |        |
|                         | 802.11be: first feature set including the non-OFDMA mode                                                              | 732639 |

| Fixed Issues                                                                                                                   |                                                                                                                                                                                        |                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Common</b>                                                                                                                  |                                                                                                                                                                                        |                                                                        |
| Error message "Output unlevelled" might occur in some situations with level sweep and Settings Characteristics = Uninterrupted |                                                                                                                                                                                        | 612985                                                                 |
| <b>Baseband</b>                                                                                                                |                                                                                                                                                                                        |                                                                        |
| 3GPP: Downlink: Crash with certain channel coding configurations.                                                              |                                                                                                                                                                                        | 809765                                                                 |
| For already configured signals, the signal can be distorted after instrument reboot.                                           |                                                                                                                                                                                        | 819091                                                                 |
| K548 Crest Factor Reduction: improved output crest factor accuracy for a variety of different signals.                         |                                                                                                                                                                                        | 77107                                                                  |
| <b>5G New Radio</b>                                                                                                            |                                                                                                                                                                                        |                                                                        |
| <b>General</b>                                                                                                                 | Allocations within a subframe might not be filled up with user payload data ordered according to playback order.                                                                       | 805145                                                                 |
|                                                                                                                                | Clipping does not work for Carrier Aggregation                                                                                                                                         | 808704                                                                 |
|                                                                                                                                | Configuration issue for data list files in case of more than one user.                                                                                                                 | 787883                                                                 |
|                                                                                                                                | Markers: Raise offset, Fall offset not applied in TDD UL/DL mode                                                                                                                       | 789034                                                                 |
|                                                                                                                                | PDSCH/PUSCH settings transfer: dmrs nid_rs and dmrs antenna ports not exported. CSI-RS bitmap flipped, RB offsets not exported.                                                        | 768574                                                                 |
|                                                                                                                                | possible inconsistencies when first increasing number of carriers then number of users                                                                                                 | 768682                                                                 |
|                                                                                                                                | Quick Settings: No SCPI for modulation type pi/2 available.                                                                                                                            | 825524                                                                 |
|                                                                                                                                | Unexpected data source behavior if there are allocations with state off.                                                                                                               | 823914                                                                 |
|                                                                                                                                | <b>Test Case Wizard</b>                                                                                                                                                                | Incorrect RB offset of interfering signal of 7.4.2B in lower frequency |
| <b>Downlink</b>                                                                                                                | Configuration issue for rate match pattern resource block data list files in case of more than one user.                                                                               | 787877                                                                 |
|                                                                                                                                | Coreset interleaving by default has an invalid parameter value combination.                                                                                                            | 792335                                                                 |
|                                                                                                                                | Creating a PDSCH through Auto DCI with format 1_0 in a cell with present CIF could fail                                                                                                | 814070                                                                 |
|                                                                                                                                | DCI field "Precoding Information and Number of Layers" in DCI 0_1 and 0_2 could have an erroneous width in the case of SRS resources configured with different number of antenna ports | 828830                                                                 |
|                                                                                                                                | Enabling "Restrict to Search Space" with a present CIF could lead to an NR5G internal error                                                                                            | 794189                                                                 |
|                                                                                                                                | No PDSCH allocation was created through Auto DCI for Format 1_0 and 1_1 in case of MCS-C-RNTI                                                                                          | 803533                                                                 |
|                                                                                                                                | Pattern initialization of coreset datasources does not work.                                                                                                                           | 803522                                                                 |
|                                                                                                                                | PDSCH target code rate is not shown correctly.                                                                                                                                         | 788936                                                                 |
|                                                                                                                                | SRI field width in DCI 0_1 and 0_2 could be erroneous                                                                                                                                  | 828819                                                                 |
|                                                                                                                                | Test models: Incorrect RNTI used in TM3_2 and TM3_3                                                                                                                                    | 767567                                                                 |
|                                                                                                                                | The default number of bits for the PUCCH resource indicator field in DCI 1_2 changed                                                                                                   | 810875                                                                 |

|                       |                                                                                                                                                                                                |        |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Uplink</b>         | PUCCH: Format 0 does not support 0 ACK bits in case of active scheduling request.                                                                                                              | 825783 |
|                       | Settings transfer: PUSCH Frequency Hopping Offset not transferred.                                                                                                                             | 788770 |
|                       | Several PTRS configurations cannot be mapped with only one SRS-PTRS Port Idx configuration.                                                                                                    | 828315 |
|                       | SRS: internal error in case of BWP RB offset != 0                                                                                                                                              | 820323 |
| <b>EUTRA/LTE</b>      |                                                                                                                                                                                                |        |
| <b>General</b>        | Crash in case of specific user filters.                                                                                                                                                        | 622579 |
|                       | For some rarely used parameters, a value change could possibly not trigger a signal recalculation.                                                                                             | 769627 |
|                       | In case of carrier aggregation, an invalid sample rate can be configured, which causes a crash.                                                                                                | 624353 |
|                       | Wrong delta-f limits for some system configurations.                                                                                                                                           | 730341 |
| <b>Downlink</b>       | DCI 1A mode "PRACH" does not work.                                                                                                                                                             | 674649 |
|                       | Issue for test model N-TM_Standalone.                                                                                                                                                          | 790511 |
|                       | Problems with Release DCI while configuring and recalling SPS settings.                                                                                                                        | 732688 |
| <b>Uplink</b>         | Crash when configuring PRACH for eMTC in some cases.                                                                                                                                           | 785922 |
|                       | Occasionally the spectrum of an NB-IoT signal in standalone mode is distorted.                                                                                                                 | 739369 |
|                       | Parameter update issue for NB-IoT FRCs.                                                                                                                                                        | 801138 |
| <b>GNSS</b>           |                                                                                                                                                                                                |        |
|                       | Ionosphere delay calculation mismatch                                                                                                                                                          | 757690 |
|                       | Rinex files generated with Assistance Data Generation contain tab characters which is not Rinex Spec. compliant.                                                                               | 465018 |
|                       | Sporadic position deviations due to 1ms errors caused by numerical issues when parsing NMEA trajectory                                                                                         | 771664 |
|                       | Importing GLONASS Rinex does not synchronize Almanac data. It is recommended to work with AGL files. Ephemeris and Almanac data are also inconsistent when changing the simulation start time. | 351472 |
|                       | In some cases, the ARC segment of trajectory files is interpreted with inverted direction, which can lead to inconsistencies in the trajectory.                                                | 508429 |
|                       | Possible misalignment of user motion file generated by offline logging due to additional delimiter at the end of each row.                                                                     | 761387 |
| <b>802.11</b>         |                                                                                                                                                                                                |        |
|                       | 802.11: The effective single trigger sequence length is twice the set value for 11b and 11p                                                                                                    | 808712 |
|                       | 802.11ax: incorrect LDPC tone mapping with DCM=on                                                                                                                                              | 782439 |
|                       | 802.11ax: Packet Extension missing                                                                                                                                                             | 819462 |
|                       | 802.11ax: post-FEC padding bits are not mapped correctly to the last 2 OFDM symbols with STBC=on                                                                                               | 803469 |
|                       | 802.11b: Incorrect filter settings when setting CCK or PBCC modulation through SCPI                                                                                                            | 820433 |
| <b>SMBVB K153 DME</b> |                                                                                                                                                                                                |        |

|                   |                                                                                      |        |
|-------------------|--------------------------------------------------------------------------------------|--------|
|                   | DME Analysis had reply delay measurement gate limited to 150us                       | 784351 |
| <b>Digital IQ</b> |                                                                                      |        |
|                   | Bugfix for SMCVB and SMBVB "Auto Level Set" function                                 | 782538 |
|                   | Fixed firmware crash in combination with internal graphics                           | 800596 |
|                   | Samplerate and level info mistakenly updated at the receiver even when state is off. | 771987 |
| <b>HRP-UWB</b>    |                                                                                      |        |
|                   | Confusing GUI label for Viterbi constraint length.                                   | 791243 |
|                   | Data Part should not be available in STS format 3 for both BPRF and HPRF modes.      | 797439 |
|                   | Idle Interval is fixed for HPRF mode.                                                | 808782 |
|                   | Issue fix for BPRF- DRBM_HP PHR Data rate Mode.                                      | 847495 |
|                   | Issue for bandwidths more than 1GHz.                                                 | 805073 |
|                   | Issue for code indices in case of HPRF mode.                                         | 791194 |
|                   | Issue for SFD = 0 in BPRF mode.                                                      | 833183 |
|                   | Issue for specific Viterbi constraint lengths in case of HPRF mode.                  | 789265 |
|                   | Signal issue in case of more than one STS segment.                                   | 789272 |
|                   | The levelling is fixed for all the STS Packet modes.                                 | 811191 |

### Known Issues

#### GNSS

|                      |                                                                                                                                                                                                                                                                                                                                                     |        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                      | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.                                                                                                                                                                                                                             | 498094 |
|                      | If start time is just before leap second insertion, the insertion might be omitted in log files.                                                                                                                                                                                                                                                    | 652559 |
|                      | Inconsistencies in logging data for SBAS.                                                                                                                                                                                                                                                                                                           | 491788 |
|                      | Issue with smoothing of trajectories                                                                                                                                                                                                                                                                                                                | 466593 |
|                      | SBAS 'Generate Correction Data Automatically' does not correctly sync with the simulated ionosphere and GPS orbit/clock errors leading to an error of few meters in the position calculated by the receiver when using the SBAS correction service. Instead the 'Replay Historical Data and Sync Atmosphere & SV errors' can be used at the moment. | 240388 |
|                      | The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                                                                                                                                                                                  | 429406 |
|                      | Possible Ionospheric simulations mismatch                                                                                                                                                                                                                                                                                                           | 762298 |
| <b>DIGIQ_SYSCONF</b> |                                                                                                                                                                                                                                                                                                                                                     |        |
|                      | DIG I/Q: Connected Device Name (IN/OUT) might be wrong, HS DIG I/Q: When start IQW streaming, BBin needs state OFF/ON again.                                                                                                                                                                                                                        | 830116 |

## 1.11 Version 4.80.041.61

Released: February 2021

### New Options

|                                                     |
|-----------------------------------------------------|
| R&S® SMBVB-K148 5G-NR Release 16                    |
| R&S® SMBVB-K448 5G-NR Release 16 with R&S®WinIQSIM2 |
| R&S® SMBVB-K149 UWB HRP                             |
| R&S® SMBVB-K449 UWB HRP with R&S®WinIQSIM2          |
| R&S® SMBVB-K97 NAVIC/IRNSS (6SVS)                   |

### New Functionality / Changed Behavior

#### Baseband

|  |                                                                       |        |
|--|-----------------------------------------------------------------------|--------|
|  | K80 Bit Error Rate Tester: Internal loopback implemented (self-test). | 401612 |
|  | K80 Bit Error Rate Tester: Minor user interface changes.              | 704681 |

#### 5G New Radio

|         |                                                                                                                                                                                                                                                                                                                             |        |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|         | Update to 3GPP specifications 38.211 V16.2.0, 38.212 V16.2.0, 38.213 V16.2.0, 38.214 V16.2.0. Test models according to 38.141 V16.5.0.                                                                                                                                                                                      | 759091 |
|         | 5G NR application version is displayed in the user interface.                                                                                                                                                                                                                                                               | 744658 |
|         | First version to support options SMBVB-K148 (5G NR Release 16) and SMBVB-K448 (5G NR Release 16 (WinIQSIM2)).                                                                                                                                                                                                               | 629981 |
|         | Support of up to 50 users with options K148/K448.                                                                                                                                                                                                                                                                           | 729225 |
|         | In the scheduling dialog, the slot number in the frame is shown in addition to the slot number in the subframe.                                                                                                                                                                                                             | 729161 |
|         | When changing to mapping type B, the number of symbols is always set to 7 first. Note that this can be a small compatibility break if you configured the number of symbols before changing the type, but it is needed as a preparation for a future Release 16 change, which would cause even a bigger compatibility break. | 742001 |
| General | Discontinued support for "exemplary" (i.e. non-standard) test models.                                                                                                                                                                                                                                                       | 634493 |
|         | Changes to "Restart Data" in User/BWP dialog, needed for NR-TM according to recent versions of 3GPP TS 38.141.                                                                                                                                                                                                              | 723400 |
|         | Configurable initialization value of PN sequences.                                                                                                                                                                                                                                                                          | 703925 |
|         | Marker mode "TDD UL/DL".                                                                                                                                                                                                                                                                                                    | 692441 |
|         | Usability functionality which eases the configuration for carrier aggregation.                                                                                                                                                                                                                                              | 704363 |
|         | Frequency for the RF upconverter phase compensation can be determined automatically by means of the RF frequency at least in some cases.                                                                                                                                                                                    | 463168 |
|         | Showing slot borders in the time plan.                                                                                                                                                                                                                                                                                      | 680164 |
|         | Possibility to configure an offset to the system frame number, with impact to e.g. hopping patterns.                                                                                                                                                                                                                        | 693116 |
|         | Configured PDSCH, PUSCH, CORESET allocations can be copied to another slot.                                                                                                                                                                                                                                                 | 675792 |

|                         |                                                                                                                                                                                     |        |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                         | Not switching automatically to "Minimum" sample rate mode anymore when using carrier aggregation (performance improvement).                                                         | 691214 |
|                         | Performance improvement for signal generation (faster signal calculation).                                                                                                          | 689051 |
| <b>Test Case Wizard</b> | Test case wizard for base station conformance tests according to 38.141-2, chapter 6.                                                                                               | 700267 |
|                         | Test case wizard for base station conformance tests according to 38.141-2, chapter 7.                                                                                               | 633100 |
| <b>Downlink</b>         | Support for release 16 PRS.                                                                                                                                                         | 722231 |
|                         | Some cleanup in the user interface of the SS/PBCH settings.                                                                                                                         | 728195 |
|                         | Support for RRC / DCI time domain allocation list also for uplink DCI 0_1.                                                                                                          | 722381 |
|                         | Support for DCI 2_6 and PS-RNTI.                                                                                                                                                    | 723859 |
|                         | Support for release 16 "Minimum applicable scheduling offset indicator".                                                                                                            | 723872 |
|                         | Auto phase compensation for NR-TM.                                                                                                                                                  | 727543 |
|                         | NR-TM update to 38.141-1 V15.5.0 and 38.141-2 V15.5.0.                                                                                                                              | 692669 |
|                         | DCI2_4 and CI-RNTI.                                                                                                                                                                 | 722234 |
|                         | More flexibility for mapping the SSPBCH antenna port to outputs of the baseband block.                                                                                              | 661619 |
|                         | Add SSPBCH starting half frame index field                                                                                                                                          | 693679 |
| <b>Uplink</b>           | Power mode "burst" also for PUCCH channels.                                                                                                                                         | 702930 |
|                         | Support for time shift according to N_TA_offset.                                                                                                                                    | 714547 |
|                         | Support for group and sequence hopping.                                                                                                                                             | 683707 |
|                         | Update of FRC assistance function to version 15.5.0 of 38.141-1 and 38.141-2. Support for FRCs which have been removed by 3GPP after early versions of 38.141-1/-2 is discontinued. | 690846 |
|                         | Configured PUCCH, PRACH allocations can be copied to another slot.                                                                                                                  | 692975 |
| <b>EUTRA/LTE</b>        |                                                                                                                                                                                     |        |
| <b>General</b>          | Some LTE / IoT options have been renamed for simplification.                                                                                                                        | 759109 |
| <b>GNSS</b>             |                                                                                                                                                                                     |        |
|                         | QZSS supports L2C and L5 and new GEO satellite                                                                                                                                      | 717330 |
|                         | IRNSS L5 SPS supported                                                                                                                                                              | 709039 |
|                         | Extension for obscuration and auto multipath simulation                                                                                                                             | 742845 |
|                         | Added the possibility to set the leap second transition in the past                                                                                                                 | 652634 |
|                         | Added the possibility to set the simulation start time to now (current simulator hardware time)                                                                                     | 631692 |
|                         | Added High Precision PPS output via I/Q connectors                                                                                                                                  | 608237 |
| <b>HRP-UWB</b>          |                                                                                                                                                                                     |        |
|                         | First version to support options K149/K449 (UWB-HRP).                                                                                                                               | 697359 |
|                         | Support of 802.15.4, 802.15.4-BPRF and 802.15.4-HPRF Modes.                                                                                                                         | 697359 |

| Fixed Issues        |                                                                                                                                                           |        |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Common</b>       |                                                                                                                                                           |        |
|                     | LF Generator shape "Square" does not work                                                                                                                 | 637133 |
| <b>Baseband</b>     |                                                                                                                                                           |        |
|                     | Custom Digital Modulation: Incorrect output of binary control lists                                                                                       | 689699 |
|                     | Custom Digital Modulation: Marker output issue on very short binary control lists (CList).                                                                | 775215 |
|                     | Custom Digital Modulation: Single trigger "Running / Stopped" display issue                                                                               | 775603 |
|                     | Custom Digital Modulation: When switching the baseband off and on again, data list files that changed on disk in the meantime were not correctly updated. | 725732 |
|                     | K62 AWGN: Maximum value of Carrier/Noise ratio limited to +40dBm, should be +45dBm                                                                        | 719546 |
|                     | K19 BB Input: RX issues with HS Dig. I/Q interface.                                                                                                       | 549493 |
|                     | K19 BB Output: Digital I/Q output, improper level setting                                                                                                 | 719417 |
|                     | K80 Bit Error Rate Tester: No signal output for BER TestGen Data and BER TestGen Clock.                                                                   | 451583 |
|                     | 3GPP FDD: Sporadic crash in case of R99 channel coding with user settings (i.e. not predefined RMCs).                                                     | 657747 |
| <b>5G New Radio</b> |                                                                                                                                                           |        |
|                     | Error message for some quick settings configurations.                                                                                                     | 752892 |
|                     | Drifting TDD DL/UL Marker Signal for 120 kHz Subcarrier Spacing                                                                                           | 757082 |
|                     | In marker mode "TDD UL/DL", sometimes invalid parameter combinations are accessible in the user interface.                                                | 757092 |
|                     | Marker delay can be configured with higher resolution than supported.                                                                                     | 745782 |
|                     | Use of incorrect sub carrier spacing to generate TDD UL/DL marker.                                                                                        | 739196 |
|                     | In trigger mode "single sequence", parameter changes regarding the duration or mode could not have an effect immediately.                                 | 740033 |
|                     | GUI crash in BWP-Config PUSCH Tab for higher carrier indices.                                                                                             | 740455 |
|                     | Crash when showing time-plan with much content.                                                                                                           | 741014 |
| <b>General</b>      | Direct input of "PointA to Carrier Center" is not adjusted properly to 15kHz resolution.                                                                  | 741966 |
|                     | Clipping for non-average power modes does not produce expected leveling                                                                                   | 743394 |
|                     | Signal calculation can run out of memory for multi carrier scenarios.                                                                                     | 681599 |
|                     | Save/recall issue for the new PN initialization value.                                                                                                    | 725419 |
|                     | Auto phase compensation is faulty after a restart of the instrument.                                                                                      | 726513 |
|                     | Issue for marker configuration rise & fall offsets.                                                                                                       | 697037 |
|                     | When using the "copy to" usability functionality, sometimes error messages are shown.                                                                     | 710607 |
|                     | Error while setting mapping mode for PDSCH/PUSCH antenna port mapping over SCPI.                                                                          | 715252 |



|                                                                                |                                                                                                                |        |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------|
|                                                                                | Possible crash after recalling settings from file.                                                             | 718366 |
|                                                                                | Signal calculation error for very small BWPs.                                                                  | 693600 |
|                                                                                | Issue for trigger mode "single sequence" when using the unit "Sample".                                         | 720566 |
| <b>Test Case Wizard</b>                                                        | OTA transmitter intermodulation test case named incorrectly.                                                   | 753883 |
|                                                                                | The RB position of narrowband interfering signal is not correct at lower frequency for case 7.4.2B and 7.7     | 758749 |
|                                                                                | Frequency ranges in the test case wizard are limited unnecessarily.                                            | 705386 |
| <b>Downlink</b>                                                                | Firmware crashes in case of invalid auto DCI settings.                                                         | 740921 |
|                                                                                | DCI bits not filled up with zeros to 12 Bits                                                                   | 754153 |
|                                                                                | PT-RS: Issue in sequence generation with Mapping TypeB                                                         | 754769 |
|                                                                                | Quick Settings: Number of Carriers $\geq 2$ don't use the Coreset State in the Scheduling Table                | 760460 |
|                                                                                | recall issues with PDSCH antenna ports                                                                         | 772638 |
|                                                                                | Configured CORESET bundle size might not be used correctly in the signal generation.                           | 755155 |
|                                                                                | Showing one SS/PBCH power in the scheduling table is confusing.                                                | 735386 |
|                                                                                | Phase compensation frequency is not auto determined when loading test models.                                  | 737955 |
|                                                                                | New SS/PBCH 64-bit patterns are not initialized properly.                                                      | 740449 |
|                                                                                | CI-RNTI is only configurable per user, but has to be configurable per BWP.                                     | 741843 |
|                                                                                | Crashes or error messages in case of specific CORESET settings.                                                | 741348 |
|                                                                                | Save/recall issue for the phase compensation mode.                                                             | 724974 |
|                                                                                | Erroneous SCPI command for DCI datasource initialization pattern.                                              | 723092 |
|                                                                                | Possible error while setting carrier deployment                                                                | 728692 |
|                                                                                | Erroneous c_init calculation for PDSCH scrambling with multiple codewords                                      | 732459 |
|                                                                                | Test Models TM2 and TM2a use PDSCHs with 14 instead of 12 symbols.                                             | 733185 |
|                                                                                | Missing SSPBCH antenna port mapping data of SCells after recall.                                               | 724933 |
|                                                                                | CS-RNTI DCI could use the wrong RNTI value.                                                                    | 714617 |
|                                                                                | Error message can show up when configuring cross-carrier scheduling.                                           | 716834 |
|                                                                                | DCI issue for VRB-to-PRB mapping in case of "dynamic switch".                                                  | 720336 |
| Unwanted preset of the position pattern when increasing the number of SSPBCHs. | 706827                                                                                                         |        |
| Configuration issue in case of more than one "custom" DCI.                     | 723273                                                                                                         |        |
| <b>Uplink</b>                                                                  | PT-RS with Transform Precoding: Error in sequence generation                                                   | 760515 |
|                                                                                | When Transform Precoding is enabled the PT-RS scaling factor cannot be determined by the scheduled modulation. | 732668 |
|                                                                                | For some scheduling configurations, turning OFF some allocations may lead to a firmware crash                  | 739884 |

|                                                                         |                                                                                                                                        |        |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------|
|                                                                         | Error in signal generation if the value NRB0 for PTRS with Transform Precoding is higher than PUSCH RB                                 | 728146 |
|                                                                         | For transform precoding, it is possible to configure invalid resource block allocations.                                               | 728187 |
|                                                                         | SCPI issue for PUSCH frequency hopping configuration.                                                                                  | 734019 |
|                                                                         | Invalid number of RBs could be configured for PUCCH format 3.                                                                          | 523022 |
|                                                                         | UCI on Pusch: Special cases for intra slot hopping not handled.                                                                        | 707068 |
|                                                                         | Data sent between DMRS in UCI-only mode and configured UCI.                                                                            | 709390 |
|                                                                         | The parameter "MCS table transform precoding" is not visible (but accessible by SCPI).                                                 | 711492 |
|                                                                         | Error in calculating ARB file for some PT-RS settings.                                                                                 | 712716 |
|                                                                         | In case of enabled transform precoding with PTRS, the DMRS ID is used for PTRS instead of N_ID^PUSCH.                                  | 716205 |
|                                                                         | Configuration issue for PTRS Auto mode in case of more than one BWP and transform precoding.                                           | 716696 |
|                                                                         | UCI on PUSCH: Incorrect number of coded CSI1 and CSI2 bits for < 2 HARQ-ACK bits calculated.                                           | 717724 |
|                                                                         | Signal generation issue in case of PTRS for transform precoding in mode "Auto".                                                        | 719358 |
|                                                                         | Issue for uci on pusch in case of small block lengths and pusch rb offset != 0.                                                        | 699486 |
|                                                                         | SCPI issue for PRACH power reference mode "burst".                                                                                     | 702754 |
|                                                                         | Issue for PUSCH in case of transform precoding and BPSK.                                                                               | 691889 |
|                                                                         | Channel coding issue for specific PUSCH UCI cases.                                                                                     | 695120 |
| <b>EUTRA/LTE</b>                                                        |                                                                                                                                        |        |
| <b>General</b>                                                          | If an instrument self test is executed after recalling specific settings, error messages show up.                                      | 724048 |
| <b>Downlink</b>                                                         | User interface issue for PDSCH scheduling mode "Auto Sequence".                                                                        | 762783 |
|                                                                         | Issue for Auto-DCI in case of special RNTIs.                                                                                           | 723451 |
| <b>Uplink</b>                                                           | When reconfiguring PUSCH frequency hopping or NPUSCH frequency hopping, it could happen that the signal is not recalculated instantly. | 769428 |
|                                                                         | NB-IoT delta offset display is not working properly in some cases.                                                                     | 780129 |
|                                                                         | In case of available option K115 but without K146, there can be a crash when configuring uplink NB-IoT.                                | 780144 |
|                                                                         | For sidelink SCI format 1 the retransmission index field is always shown as 0 but is actually automatically determined to be 0 or 1.   | 675221 |
|                                                                         | For some cases, the FRC usability function allows invalid values of the NB-IoT subcarrier indication.                                  | 735861 |
|                                                                         | For carrier aggregation involving PUSCH signals, relative leveling of carriers can be wrong.                                           | 709427 |
|                                                                         | For some cases, the FRC usability function unnecessarily restricts the NB-IoT subcarrier offset.                                       | 724556 |
|                                                                         | Possible crash for certain PUSCH frequency hopping settings.                                                                           | 732896 |
| Save/recall issue if working with several component carriers in uplink. | 709428                                                                                                                                 |        |

| <b>GNSS</b>                   |                                                                                                                                                                                                                           |        |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                               | Altitude and Yaw, Pitch, Roll parsed incorrectly for .xtd File import in case .xtd File has no timestamps                                                                                                                 | 757332 |
|                               | Changing the CW frequency of a CW interferer has no influence                                                                                                                                                             | 729423 |
|                               | Inconsistency of attitude parameters in HIL command Mode A. The correct order is Yaw,Pitch,Roll                                                                                                                           | 769336 |
|                               | Maximum number of SVs ignored in certain circumstance                                                                                                                                                                     | 626506 |
|                               | Missing marker output during GNSS simulation                                                                                                                                                                              | 737513 |
|                               | Reading of NMEA files with timestamps passing over midnight causes failure. Customers having had these issues may need to delete internal trajectory copies on the device via: Setup->Maintenance->Delete Temporary Files | 727316 |
|                               | Retriggering the simulation can lead to errors if satellite handovers have occurred before                                                                                                                                | 707675 |
|                               | Beidou CUS/CRC data correction                                                                                                                                                                                            | 753065 |
|                               | Some SMBV-P101 remote commands are not supported by SMBV100B                                                                                                                                                              | 747359 |
|                               | Time offset within internal data logging of user trajectories is misaligned                                                                                                                                               | 727341 |
|                               | When opening two "Power Spectrum" graphics for the same "Source", the second instance has a wrong x-axis scaling                                                                                                          | 690896 |
|                               | Wrong leap second encoding in case leap second event is >127 weeks in the past or future from current simulation time                                                                                                     | 709273 |
| <b>OFDM Signal Generation</b> |                                                                                                                                                                                                                           |        |
|                               | Issue when exporting the configuration for R&S signal analyzers.                                                                                                                                                          | 729109 |
| <b>802.11</b>                 |                                                                                                                                                                                                                           |        |
|                               | 802.11: In some cases A-MPDU data length is not shown correctly in the GUI when loading a settings file.                                                                                                                  | 749157 |
|                               | 802.11: Setting the scrambler to On (Random Init) initialized the scrambler with the same value and not random values                                                                                                     | 734027 |
|                               | 802.11: Unwanted signal output during signal recalculation after parameter changes in single trigger mode                                                                                                                 | 717545 |
|                               | 802.11ax: Datasource position incorrectly set to 0 at the beginning of each frame                                                                                                                                         | 740121 |
|                               | 802.11b: Improved chip clock error in 20MHz bandwidth.                                                                                                                                                                    | 718149 |
|                               | 802.11n: Incorrect LDPC encoding with some specific data lengths.                                                                                                                                                         | 716913 |
|                               | 802.11ac: Encoding of long VHT frames incorrect.                                                                                                                                                                          | 704066 |
|                               | 802.11n: Incorrect channel encoding for MCS > 9 in MIMO modes.                                                                                                                                                            | 704059 |
|                               | 802.11n: Incorrect output power for stream B in 20MHz bandwidth, coupled mode and IFFT upsampling enabled.                                                                                                                | 746112 |
|                               | 802.11n: Incorrectly encoded MCS value in HT-SIG for 2 and 3 space time streams                                                                                                                                           | 747143 |
| <b>Avionic</b>                |                                                                                                                                                                                                                           |        |
|                               | ILS User Frequency Setting not always working                                                                                                                                                                             | 755644 |
| <b>SMBVB K153 DME</b>         |                                                                                                                                                                                                                           |        |

|  |                                                                                                                  |        |
|--|------------------------------------------------------------------------------------------------------------------|--------|
|  | DME Signal was distorted after rebooting the instrument                                                          | 759592 |
|  | Search Trigger Level did not work for pulse rates below 10 Hz.<br>Improved detection down to 4 pulses per second | 782753 |

| Known-Issues              |                                                                                                                                                                                                                                                                                                                                                     |        |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Baseband</b>           |                                                                                                                                                                                                                                                                                                                                                     |        |
|                           | External clock is not supported                                                                                                                                                                                                                                                                                                                     |        |
| <b>External Reference</b> |                                                                                                                                                                                                                                                                                                                                                     |        |
|                           | In rare cases the error message 'RFB6.BB: Output unlevelled: Gain Control on Upper Limit' appears if the external reference frequency was switched from external to internal.                                                                                                                                                                       | 421671 |
| <b>GNSS</b>               |                                                                                                                                                                                                                                                                                                                                                     |        |
|                           | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.                                                                                                                                                                                                                             | 498094 |
|                           | If start time is just before leap second insertion, the insertion might be omitted in log files.                                                                                                                                                                                                                                                    | 652559 |
|                           | In some cases the ARC segment of trajectory files is interpreted with inverted direction, which can lead to inconsistencies in the trajectory.                                                                                                                                                                                                      | 508429 |
|                           | Inconsistencies in logging data for SBAS.                                                                                                                                                                                                                                                                                                           | 491788 |
|                           | Issue with smoothing of trajectories                                                                                                                                                                                                                                                                                                                | 466593 |
|                           | Importing GLONASS Rinex does not synchronize Almanac data. It is recommended to work with AGL files. Ephemeris and Almanac data are also inconsistent when changing the simulation start time                                                                                                                                                       | 351472 |
|                           | SBAS 'Generate Correction Data Automatically' does not correctly sync with the simulated ionosphere and GPS orbit/clock errors leading to an error of few meters in the position calculated by the receiver when using the SBAS correction service. Instead the 'Replay Historical Data and Sync Atmosphere & SV errors' can be used at the moment. | 240388 |
|                           | The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                                                                                                                                                                                  | 429406 |
|                           | Possible misalignment of user motion file generated by offline logging due to additional delimiter at the end of each row.                                                                                                                                                                                                                          | 761387 |
|                           | Ionosphere delay calculation mismatch                                                                                                                                                                                                                                                                                                               | 757690 |

## 1.12 Version 4.70.128.48

Released: August 2020

## New Options

None

## New Functionality / Changed Behavior

None

## Fixed Issues

### RF

|  |                                                                                                                 |        |
|--|-----------------------------------------------------------------------------------------------------------------|--------|
|  | If no K31 is installed, an error message appears for levels > 20 dBm but does not disappear for levels < 20 dBm | 735336 |
|--|-----------------------------------------------------------------------------------------------------------------|--------|

### 5G New Radio

|         |                                                         |        |
|---------|---------------------------------------------------------|--------|
| General | Configuration issue for trigger mode "single sequence". | 697014 |
|---------|---------------------------------------------------------|--------|

## Known-Issues

### Baseband

|  |                                                   |        |
|--|---------------------------------------------------|--------|
|  | External clock is not supported                   |        |
|  | Marker and IQ/RF-Timing after Trigger not correct | 664675 |

### External Reference

|  |                                                                                                                                                                               |        |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  | In rare cases the error message 'RFB6.BB: Output unlevelled: Gain Control on Upper Limit' appears if the external reference frequency was switched from external to internal. | 421671 |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|

### GNSS

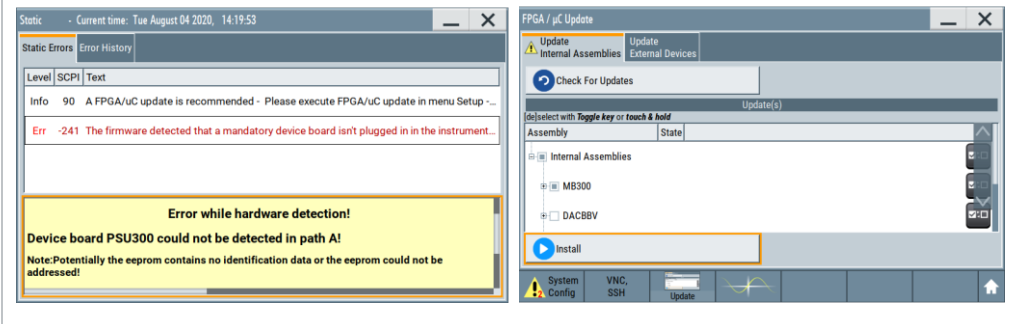
|  |                                                                                                                                                                                                                                                                                                                                                     |        |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.                                                                                                                                                                                                                             | 498094 |
|  | If start time is just before leap second insertion, the insertion might be omitted in log files.                                                                                                                                                                                                                                                    | 652559 |
|  | In some cases the ARC segment of trajectory files is interpreted with inverted direction, which can lead to inconsistencies in the trajectory.                                                                                                                                                                                                      | 508429 |
|  | Inconsistencies in logging data for SBAS.                                                                                                                                                                                                                                                                                                           | 491788 |
|  | Issue with smoothing of trajectories                                                                                                                                                                                                                                                                                                                | 466593 |
|  | Importing GLONASS Rinex does not synchronize Almanac data. It is recommended to work with AGL files. Ephemeris and Almanac data are also inconsistent when changing the simulation start time.                                                                                                                                                      | 351472 |
|  | SBAS 'Generate Correction Data Automatically' does not correctly sync with the simulated ionosphere and GPS orbit/clock errors leading to an error of few meters in the position calculated by the receiver when using the SBAS correction service. Instead the 'Replay Historical Data and Sync Atmosphere & SV errors' can be used at the moment. | 240388 |
|  | The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                                                                                                                                                                                  | 429406 |
|  | Retriggering the simulation can lead to errors if satellite handovers have occurred before.                                                                                                                                                                                                                                                         | 707675 |

### 1.13 Version 4.70.128.43

Released: August 2020

#### Important Update Information

|  |                                                                                                                                                                                                                                                                                      |        |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  | <p>A FPGA / uC Update and a reboot is necessary to fix the PSU300 detection error</p> <p>An error message will occur during the first startup with this firmware version. Please execute <b>“Setup” / “Maintenance” / “FPGA / uC Update” / “Install”</b> and restart the device.</p> | 694685 |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|



#### New Options

R&S® SMBVB-K297 NavIC / IRNSS 1 satellite with R&S®WinIQSIM2

#### New Functionality / Changed Behavior

##### Common

|  |                                                                                                                                                       |        |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  | Ca. 30% faster internal adjustments                                                                                                                   | 662773 |
|  | Temperature Compensation for increased Level accuracy for temperatures below +18 °C and above +33 °C is active with datasheet Version higher than 6.0 | 365716 |

##### Baseband

|  |                                                               |        |
|--|---------------------------------------------------------------|--------|
|  | Changed threshold for Baseband Sync Input from 0.2 V to 0.5 V | 641830 |
|--|---------------------------------------------------------------|--------|

| <b>IEEE 802.11 a/b/g/n/ax WLAN</b>                                                                                          |                                                                                                                          |        |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------|
| 802.11ax                                                                                                                    | Added support for proprietary 4096 QAM modulation                                                                        | 654426 |
| <b>OFDM Signal Generation</b>                                                                                               |                                                                                                                          |        |
|                                                                                                                             | Fewer redundant entries in exported xml settings                                                                         | 620177 |
| <b>5G New Radio</b>                                                                                                         |                                                                                                                          |        |
| General                                                                                                                     | Additional information is shown regarding powers of several signal parts and in reference to several bandwidths.         | 634188 |
|                                                                                                                             | Allow phase precompensation frequencies beyond the frequencies of available RF options.                                  | 644246 |
|                                                                                                                             | Avoid non-functional (extreme) settings for constant PSD power mode by means of GUI restriction.                         | 679268 |
|                                                                                                                             | Calculation speed improvement.                                                                                           | 636646 |
|                                                                                                                             | Crest factor reduction (K548 needed).                                                                                    | 591092 |
|                                                                                                                             | GUI cleanup regarding DMRS antenna port configuration.                                                                   | 676799 |
|                                                                                                                             | Possibility to restart data and control payload in each allocation.                                                      | 649325 |
|                                                                                                                             | Possibility to zoom into time plan.                                                                                      | 623927 |
|                                                                                                                             | Power mode "Burst".                                                                                                      | 589595 |
|                                                                                                                             | Quick Settings feature for fast and convenient setup of the 5G NR signal configuration.                                  | 608818 |
|                                                                                                                             | Relative powers for carrier aggregation.                                                                                 | 663296 |
|                                                                                                                             | Resource allocation type 0 also for PUSCH and for manually configured PDSCH (i.e. without DCI).                          | 600970 |
|                                                                                                                             | Simplified configuration of PDSCH/PUSCH type A / B RRC parameters (backwards compatible for SCPI and setup file recall). | 663758 |
|                                                                                                                             | Support for extended cyclic prefix.                                                                                      | 413013 |
|                                                                                                                             | Support of non-average power modes for filter mode "fast".                                                               | 654092 |
|                                                                                                                             | The BWP size is set to maximum now also on deployment and SCS change.                                                    | 644204 |
| Update to 3GPP specifications 38.211 V15.8.0, 38.212 V15.8.0, 38.213 V15.8.0, 38.214 V15.8.0.                               | 684912                                                                                                                   |        |
| When changing the content type (channel type) of an allocation, the remaining allocation parameters are now set to default. | 648199                                                                                                                   |        |
| Test Case Wizard                                                                                                            | Test case wizard for base station conformance tests according to 38.141-1, chapter 6.                                    | 628968 |
|                                                                                                                             | Test case wizard for base station conformance tests according to 38.141-1, chapter 7.                                    | 416248 |
| Downlink                                                                                                                    | CBG based transmission.                                                                                                  | 664004 |
|                                                                                                                             | Define the CORESET RBs by means of a frequency domain bitmap.                                                            | 627756 |
|                                                                                                                             | Enable different DMRS position for LTE-CRS Coexistence cases as default (Two fringe cases of LTECRS).                    | 602610 |
|                                                                                                                             | More flexibility for configuring time domain resource assignment and bandwidth part indicator in DCI 0_1.                | 663860 |
|                                                                                                                             | Support for additional common search space types.                                                                        | 665921 |
|                                                                                                                             | Support for cross-carrier scheduling.                                                                                    | 487173 |

|                  |                                                                                                                                                                            |        |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                  | Support for DCI format 2_0, 2_1, 2_2.                                                                                                                                      | 615140 |
|                  | Support for DCI format 2_3.                                                                                                                                                | 632554 |
|                  | Support for dynamic HARQ-ACK codebook mode selection and DAI bits in DCI.                                                                                                  | 632845 |
|                  | Support for further RNTI types.                                                                                                                                            | 659412 |
|                  | Support for PDSCH PRB bundling.                                                                                                                                            | 618711 |
|                  | Support for SFI-RNTI, INT-RNTI, TPC-PUSCH-RNTI, TPC-PUCCH-RNTI, TPC-SRS-RNTI.                                                                                              | 615141 |
| Uplink           | PUSCH frequency hopping.                                                                                                                                                   | 617538 |
|                  | Support for SRS frequency hopping.                                                                                                                                         | 617559 |
|                  | Support larger payload for UCI.                                                                                                                                            | 654089 |
| <b>K153</b>      |                                                                                                                                                                            |        |
|                  | Prerequisites for delay normalization (set correct RF power Level and ensure that the RF is switched on) are now performed automatically during the normalization process. | 662730 |
| <b>EUTRA/LTE</b> |                                                                                                                                                                            |        |
| Downlink         | K81 logging for NB-IoT wakeup signals (NWUS).                                                                                                                              | 673344 |
|                  | NB-IoT wakeup signals (NWUS).                                                                                                                                              | 618878 |
|                  | TDD for NB-IoT downlink.                                                                                                                                                   | 609553 |
| Uplink           | Support for NB-IoT early data transmission.                                                                                                                                | 633084 |
|                  | Support for V2X RMCs of 3GPP TS 36.521.                                                                                                                                    | 630475 |
| <b>GNSS</b>      |                                                                                                                                                                            |        |
|                  | Maximum number of GNSS channels increased to 102.                                                                                                                          | 652310 |
|                  | Galileo E6 chip sequences are supported                                                                                                                                    | 619372 |
|                  | Allow value of semi-major axis in navigation message to be 0.0 for Galileo                                                                                                 | 657642 |
|                  | Elevation/Azimuth monitor plots are using from now ""UTC Time"" scale."                                                                                                    | 652546 |
|                  | Export of predefined Waypoint files implemented                                                                                                                            | 678944 |
|                  | Implemented AWGN with reduced bandwidth and centered on L1 / L2 / L5 Band frequencies                                                                                      | 628602 |
|                  | Added new predefined scenario 3GPP TS 37.571-2: S7 Signaling ST15                                                                                                          | 663715 |
|                  | Prbs, patterns are supported as a message type                                                                                                                             | 633272 |
|                  | The navigation message can hold PRBS sequence                                                                                                                              | 633568 |
|                  | Added output of high precise and low jitter PPS signal (synchronized to GNSS signals) via analog I/Q connectors.                                                           | 608237 |

## Fixed Issues

### Common

|  |                           |        |
|--|---------------------------|--------|
|  | Touch operations improved | 489016 |
|--|---------------------------|--------|



|                                            |                                                                                                                                                                                                              |                                                                        |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
|                                            | Issue with manual trigger on USER5 connector.                                                                                                                                                                | 507994                                                                 |
|                                            | User Correction: Fill operation of table editor does not work                                                                                                                                                | 682122                                                                 |
| <b>Baseband</b>                            |                                                                                                                                                                                                              |                                                                        |
|                                            | Wrong PEP value is shown when digital modulation and AWGN is on                                                                                                                                              | 700883                                                                 |
|                                            | SMBV100B in slave mode gets triggered permanently                                                                                                                                                            | 651119                                                                 |
| <b>5G New Radio</b>                        |                                                                                                                                                                                                              |                                                                        |
| General                                    | Bad ACLR when clipping mode is active.                                                                                                                                                                       | 576437                                                                 |
|                                            | BWP size is not always correctly adapted after channel BW change.                                                                                                                                            | 644197                                                                 |
|                                            | Cell Mapped button has no effect.                                                                                                                                                                            | 673302                                                                 |
|                                            | Configuration resolution of phase precompensation frequency is not sufficient.                                                                                                                               | 629202                                                                 |
|                                            | 5G NR: General: Error messages when using carrier aggregation and specific carrier spacings.                                                                                                                 | 663774                                                                 |
|                                            | EVM degradation for specific carrier aggregation settings.                                                                                                                                                   | 648464                                                                 |
|                                            | For a certain sequence of configuration, an allocation's antenna port table can end up in a faulty state.                                                                                                    | 634293                                                                 |
|                                            | For some data source parameters, the signal is not reliably recalculated on value change.                                                                                                                    | 662475                                                                 |
|                                            | In case of PUSCH transmission in mode "Codebook" the precoding matrix is not correctly applied to DMRS and data REs. Also, some cleanup is needed in the UE for the antenna port configuration in this case. | 666492                                                                 |
|                                            | In power mode "average active subframe" the power can be wrong if allocations are configured but their state is off.                                                                                         | 632491                                                                 |
|                                            | In some cases, the PDSCH/PUSCH mapping type B cannot be configured although it should be configurable.                                                                                                       | 653819                                                                 |
|                                            | Issue for PTRS in case of Auto-DCI.                                                                                                                                                                          | 649925                                                                 |
|                                            | Issue in case of certain PTRS settings.                                                                                                                                                                      | 661368                                                                 |
|                                            | Issue in case of more than eight component carriers.                                                                                                                                                         | 647150                                                                 |
|                                            | Issue in case of PTRS and PDSCH/PUSCH for several antenna ports.                                                                                                                                             | 684963                                                                 |
|                                            | On specific carrier aggregation settings, a "maximum resampler input rate exceeded" error is shown.                                                                                                          | 672040                                                                 |
|                                            | PTRS issue for BWPs with RB offset.                                                                                                                                                                          | 642657                                                                 |
|                                            | SCPI issue for PDSCH/PUSCH antenna port selection.                                                                                                                                                           | 634842                                                                 |
|                                            | UI configuration and range issue around carrier aggregation delta f parameter.                                                                                                                               | 686932                                                                 |
|                                            | Unlocking protection level 1 for detailed 5G NR internal state information can cause firmware stability issues.                                                                                              | 628557                                                                 |
|                                            | When working with RBGs, some GUI parameters could not be updated when changing others.                                                                                                                       | 645250                                                                 |
|                                            | Downlink                                                                                                                                                                                                     | Coreset Aggregation Level issue when increasing Number of Allocations. |
| DCI issue for time domain allocation list. |                                                                                                                                                                                                              | 647978                                                                 |

|        |                                                                                                                                                                                                                       |        |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|        | dmrs-AdditionalPosition is not calculated reliably in case of Auto-DCI.                                                                                                                                               | 657786 |
|        | Issue for automatically created PDSCH in case of used time domain allocation list.                                                                                                                                    | 647369 |
|        | Issue for querying some of the DCI parameters by SCPI.                                                                                                                                                                | 679709 |
|        | Issue for some short DCI.                                                                                                                                                                                             | 687824 |
|        | Issue for time domain allocation list for certain values of K0.                                                                                                                                                       | 639532 |
|        | Issue for time domain resource allocation list in case of SI-RNTI.                                                                                                                                                    | 642174 |
|        | Issue for VRB-to-PRB mapping in specific cases.                                                                                                                                                                       | 650337 |
|        | Issue in case of DMRS add. pos. index in case of DCI 1_1 scheduled PDSCH.                                                                                                                                             | 633863 |
|        | Issue when recalling DCI parameters from old files.                                                                                                                                                                   | 696146 |
|        | Issue when using time domain allocation list in combination with PDSCH mapping type B.                                                                                                                                | 639541 |
|        | MIB configuration issue in case of more than one cell.                                                                                                                                                                | 647938 |
|        | Minor issue for the time domain allocation list.                                                                                                                                                                      | 625094 |
|        | Number of bits for time domain resource assignment in DCI 1_1 can be wrong.                                                                                                                                           | 632574 |
|        | PDSCH TxScheme configuration is not visible for certain settings.                                                                                                                                                     | 660373 |
|        | Scrambling and channel coding is incorrect in NR_TMs 1_2, 3_2, 3_3.                                                                                                                                                   | 626915 |
|        | Scrambling issue for PDSCH in case of AutoDci and specific RNTI types.                                                                                                                                                | 668913 |
|        | VRB-to-PRB DCI bit is present in non-interleaved mode.                                                                                                                                                                | 649839 |
| Uplink | Configuration issue for SRS number of antenna ports in case of several SRS resources.                                                                                                                                 | 678007 |
|        | Configuration issue of PRACH custom repetition.                                                                                                                                                                       | 646112 |
|        | Cyclic Shift Issue for PRACH Restricted Type B in very limited configurations.                                                                                                                                        | 663971 |
|        | Fix for PUSCH UCI in case of mapping type B.                                                                                                                                                                          | 635768 |
|        | For four PUSCH Mapping type B configurations the number of DMRS symbols is not correct.                                                                                                                               | 691066 |
|        | Incorrect maximum for PUSCH DMRS length for config type 2.                                                                                                                                                            | 672758 |
|        | Issue for AP selection of PUSCH in case of "codebook".                                                                                                                                                                | 658616 |
|        | Issue for certain PTRS configurations.                                                                                                                                                                                | 651219 |
|        | Issue for certain PTRS configurations.                                                                                                                                                                                | 662858 |
|        | Issue for PRACH in case of filter mode "Channel BW".                                                                                                                                                                  | 645165 |
|        | Issue for precoding of PTRS in codebook mode without transform precoding.                                                                                                                                             | 666807 |
|        | Issue for PUCCH n_D and scramblingID0 calculation in some cases. Previously always defaulting to Cell-Id now aligned with specification (dmrs-UplinkForPUSCH-MappingTypeB/scramblingID0; dataScramblingIdentityPUSCH) | 642447 |
|        | Issue for specific PRACH cases.                                                                                                                                                                                       | 680813 |
|        | Issue of power mode "constant PSD" in case of PRACH.                                                                                                                                                                  | 632567 |

|                                    |                                                                                                                                      |        |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------|
|                                    | Issue with specific PUSCH UCI configurations in case of PTRS.                                                                        | 667385 |
|                                    | Issue with specific PUSCH UCI configurations in case of PTRS.                                                                        | 683455 |
|                                    | Minor issue of PTRS in case of PUSCH transform precoding.                                                                            | 673529 |
|                                    | PUCCH generation fails with an error message for specific scheduling configurations.                                                 | 634177 |
|                                    | PUSCH TPMI is not selectable in all cases.                                                                                           | 685145 |
|                                    | SRS can be erroneously configured outside the BWP.                                                                                   | 667791 |
|                                    | UCI on PUSCH broken for a resource block offset different from 0.                                                                    | 688130 |
|                                    | With activated FRC usability functionality not all settings are recalled correctly from setup files.                                 | 678333 |
| <b>K548 Crest Factor Reduction</b> |                                                                                                                                      |        |
|                                    | CFR feature not working without installed option K811                                                                                | 692124 |
| <b>SMBVB K153 DME</b>              |                                                                                                                                      |        |
|                                    | DME reply delay measurement was disturbed by reply signals that do not have a 100% reply efficiency causing large measurement errors | 647434 |
|                                    | SMBVB K153 DME : DME measurements were not working at all. Thread was disabled                                                       | 647434 |
|                                    | SMBVB K153 DME : DME measurement timings were off by about 2us                                                                       | 647434 |
|                                    | SMBVB K153 DME : Enabling the DME Measurements caused a signal glitch with the period of the measurement                             | 647434 |
|                                    | SMBVB K153 DME : Fixed reply efficiency measurement bug. Reply count was off by +-1                                                  | 647434 |
|                                    | SMBVB K153 DME : Switching from X to Y channel in interrogator mode caused a unnecessary warning                                     | 647434 |
|                                    | SMBVB K153 DME : The DME measurement was not correctly synchronized causing unstable results                                         | 647434 |
|                                    | SMBVB K153 DME : Timings in reply mode were off by about 2us                                                                         | 647434 |
| <b>EUTRA/LTE</b>                   |                                                                                                                                      |        |
| General                            | For NB-IoT, RB frequency positions are not reliably updated if other parameters are changed in the UI.                               | 647713 |
| Test Case Wizard                   | RF state might be reset on applying a test case.                                                                                     | 623190 |
| Downlink                           | DCI issue for NB-IoT.                                                                                                                | 604942 |
|                                    | NB-IoT carrier RB index is not reliably updated after channel BW change.                                                             | 635586 |
| Uplink                             | Configured NPRACH resource block index is sometimes not used correctly for signal generation.                                        | 642721 |
|                                    | For some configurations the NB-IoT NPRACH is incorrect.                                                                              | 652958 |
|                                    | If PRACH and PUSCH users (or NPRACH and NPUSCH users) are active simultaneously, the relative leveling can be wrong.                 | 633630 |
|                                    | Issue for V2X MIB coding in PSBCH.                                                                                                   | 642810 |
|                                    | NPRACH delta f is not working correctly for some UEs.                                                                                | 642748 |
|                                    | SCPI issue for NPRACH start time.                                                                                                    | 645175 |
| <b>BER</b>                         |                                                                                                                                      |        |

|                                    |                                                                                                                                    |                  |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------|
|                                    | Fixed Bit Error Rate test generator (Selftest) issues.                                                                             | 492557           |
|                                    | Issue with clock state display                                                                                                     | 571351           |
| <b>Custom Digital Modulation</b>   |                                                                                                                                    |                  |
|                                    | Effective single trigger sequence length shorter than specified value, especially for low symbol rates                             | 539878<br>567990 |
|                                    | Power ramping does not work in conjunction with binary control list signals                                                        | 689699           |
|                                    | After preset the symbol clock output may be generated with wrong frequency0                                                        | 685983           |
| <b>Bluetooth</b>                   |                                                                                                                                    |                  |
|                                    | Automatically adjust sequence length according to configured parameter sets with active dirty transmitter test                     | 684304           |
| <b>BBin Interface HS DIG I/Q</b>   |                                                                                                                                    |                  |
|                                    | Samplerate might be incorrectly rounded                                                                                            | 627442           |
| <b>IEEE 802.11 a/b/g/n/ax WLAN</b> |                                                                                                                                    |                  |
|                                    | Incorrect sequence duration for single trigger mode                                                                                | 697685           |
|                                    | Inverted transmission order of HT Control/VHT Control field of MAC header                                                          | 686282           |
|                                    | Limit L-SIG length field value to 4095                                                                                             | 697661           |
|                                    | Fixed padding subfield in the last A-MPDU subframe for VHT and HT frames                                                           | 695149           |
|                                    | Bugfix for VHT-20 with LDPC and MCS9                                                                                               | 692399           |
|                                    | Bugfix for HE-SU-EXT with 2xLTF, 0.8 GI and MCS2                                                                                   | 692399           |
|                                    | 802.11ax: Incorrect channel coding for MCS0 and MCS4 with STBC when DCM is active                                                  | 654510           |
|                                    | 802.11ax: incorrect channel encoding with MCS = 4 and STBC on                                                                      | 654713           |
| <b>GNSS</b>                        |                                                                                                                                    |                  |
|                                    | Antenna pattern 3D plot does not match 2D plot due to inverted rotation direction of azimuth angle.                                | 657245           |
|                                    | If start time is just before leap second insertion, the insertion might be omitted.                                                | 408616           |
|                                    | Improved protection against parsing corrupt RINEX navigation data files                                                            | 649077           |
|                                    | With cyclic Waypoints the receiver velocity reported with the SCPI RT:REC:RVELOCITY? UTC,{DateTime} is wrong after the first loop. | 538754           |
|                                    | Discontinuities in trajectory sometimes when loading large .kml File                                                               | 521548           |
|                                    | Multipath power not correct when simulating LOS+echo and the echo has reduced power.                                               | 635828           |

## Known-Issues

### RF

|  |                                                                                                                 |        |
|--|-----------------------------------------------------------------------------------------------------------------|--------|
|  | If no K31 is installed, an error message appears for levels > 20 dBm but does not disappear for levels < 20 dBm | 735336 |
|--|-----------------------------------------------------------------------------------------------------------------|--------|

| Baseband           |                                                                                                                                                                                                                                                                                                                                                     |        |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                    | External clock is not supported                                                                                                                                                                                                                                                                                                                     |        |
|                    | Marker and IQ/RF-Timing after Trigger not correct                                                                                                                                                                                                                                                                                                   | 664675 |
| External Reference |                                                                                                                                                                                                                                                                                                                                                     |        |
|                    | In rare cases the error message 'RFB6.BB: Output unlevelled: Gain Control on Upper Limit' appears if the external reference frequency was switched from external to internal.                                                                                                                                                                       | 421671 |
| GNSS               |                                                                                                                                                                                                                                                                                                                                                     |        |
|                    | Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.                                                                                                                                                                                                                             | 498094 |
|                    | If start time is just before leap second insertion, the insertion might be omitted in log files.                                                                                                                                                                                                                                                    | 652559 |
|                    | In some cases the ARC segment of trajectory files is interpreted with inverted direction, which can lead to inconsistencies in the trajectory.                                                                                                                                                                                                      | 508429 |
|                    | Inconsistencies in logging data for SBAS.                                                                                                                                                                                                                                                                                                           | 491788 |
|                    | Issue with smoothing of trajectories                                                                                                                                                                                                                                                                                                                | 466593 |
|                    | Importing GLONASS Rinex does not synchronize Almanac data. It is recommended to work with AGL files. Ephemeris and Almanac data are also inconsistent when changing the simulation start time.                                                                                                                                                      | 351472 |
|                    | SBAS 'Generate Correction Data Automatically' does not correctly sync with the simulated ionosphere and GPS orbit/clock errors leading to an error of few meters in the position calculated by the receiver when using the SBAS correction service. Instead the 'Replay Historical Data and Sync Atmosphere & SV errors' can be used at the moment. | 240388 |
|                    | The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                                                                                                                                                                                  | 429406 |
|                    | Retriggering the simulation can lead to errors if satellite handovers have occurred before.                                                                                                                                                                                                                                                         | 707675 |

## 1.14 Version 4.70.006.33

Released: January 2020

### New Options

R&S® SMBVB-K19 Digital Baseband Output

R&S® SMBVB-K132 Modernized Beidou

R&S® SMBVB-K146 Cellular IoT Release 15

R&S® SMBVB-K432 Modernized Beidou with R&S®WinIQSIM2

R&S® SMBVB-K446 Cellular IoT Release 15 with R&S®WinIQSIM2

R&S® SMBVB-K548 Crest factor reduction

### New Functionality / Changed Behavior

| <b>Common</b>                              |                                                                                                                                                                                                                                                                                                                  |        |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                                            | Context menu can be accessed by pressing the rotary knob for some time.                                                                                                                                                                                                                                          | 362578 |
|                                            | The following options change its description to <ul style="list-style-type: none"> <li>SMBVB-K119 LTE Release 13/14/15</li> <li>SMBVB-K143 Cellular IoT Release 14</li> <li>SMBVB-K419 LTE Release 13/14/15 for R&amp;S® WinIQSIM2</li> <li>SMBVB-K443 Cellular IoT Release 14 for R&amp;S® WinIQSIM2</li> </ul> | 583867 |
| <b>RF</b>                                  |                                                                                                                                                                                                                                                                                                                  |        |
|                                            | Extended Mixer Mode<br>This feature requires re-execution of the internal adjustments.                                                                                                                                                                                                                           | 578641 |
| <b>IEEE 802.11 a/b/g/n WLAN</b>            |                                                                                                                                                                                                                                                                                                                  |        |
|                                            | Data tab displays frame active duration and duty cycle (active_time / total_time)                                                                                                                                                                                                                                | 598969 |
| <b>OFDM Signal Generation</b>              |                                                                                                                                                                                                                                                                                                                  |        |
|                                            | Generating signals with a bandwidth slightly higher than the instrument's specified bandwidth is possible for special applications. If this is done, a warning is indicated.                                                                                                                                     | 573485 |
|                                            | XML export functionality is now accessible via the user interface.                                                                                                                                                                                                                                               | 573487 |
| <b>5G New Radio</b>                        |                                                                                                                                                                                                                                                                                                                  |        |
| Downlink                                   | Changed default values of CSIRS I0 and I1 in order to avoid overlap with default coreset.                                                                                                                                                                                                                        | 586026 |
|                                            | NR-TM update to 38.141-1 V15.2.0 and 38.141-2 V15.2.0.                                                                                                                                                                                                                                                           | 580209 |
|                                            | PDSCH mapping for LTE CRS coexistence.                                                                                                                                                                                                                                                                           | 587685 |
|                                            | SFN offset for SSPBCH.                                                                                                                                                                                                                                                                                           | 571173 |
|                                            | Support a higher number of CSIRS resources. Note that this introduces a save/recall compatibility break. If you recall old setup files with CSI-RS, please re-check the configured CSI-RS AP mapping!                                                                                                            | 571843 |
|                                            | Support CSIRS smaller than BWP.                                                                                                                                                                                                                                                                                  | 588360 |
|                                            | Support for PDSCH rate matching patterns.                                                                                                                                                                                                                                                                        | 581301 |
|                                            | Support for PDSCH time domain scheduling by means of PDSCH Time Domain Allocation List.                                                                                                                                                                                                                          | 574634 |
|                                            | Support for quasi co-location TCI field in DCI1_1.                                                                                                                                                                                                                                                               | 612790 |
|                                            | Support for selection of active UL BWP in case of DL signal generation (needed for DCI).                                                                                                                                                                                                                         | 587519 |
|                                            | Support for VRB different from PRB.                                                                                                                                                                                                                                                                              | 413021 |
|                                            | Support manual SSPBCH subcarrier offset for MIB.                                                                                                                                                                                                                                                                 | 570601 |
|                                            | Support of PDSCH resource allocation type 0.                                                                                                                                                                                                                                                                     | 591993 |
|                                            | Support of PDSCH-to-HARQ feedback timing indicator in DCI 1_1.                                                                                                                                                                                                                                                   | 573925 |
|                                            | Support of SI-RNTI.                                                                                                                                                                                                                                                                                              | 576478 |
| Unused coreset CCEs can be used for PDSCH. | 598977                                                                                                                                                                                                                                                                                                           |        |
| General                                    | Allowing very narrow BWPs (1 RB).                                                                                                                                                                                                                                                                                | 554527 |
|                                            | By default, now a BWP is set to the maximum allowed size after a change of the channel bandwidth.                                                                                                                                                                                                                | 585197 |

|                  |                                                                                                                                                                                                                                                                           |        |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                  | Carrier aggregation now also in separate system configurations.                                                                                                                                                                                                           | 413039 |
|                  | Filter mode "fast".                                                                                                                                                                                                                                                       | 589713 |
|                  | New sample rate mode "minimum".                                                                                                                                                                                                                                           | 589111 |
|                  | Overlapping allocations are indicated in the scheduling table.                                                                                                                                                                                                            | 623243 |
|                  | Phase precompensation is now on by default also for the "exemplary" test models.                                                                                                                                                                                          | 608215 |
|                  | Removed the current implementation of the slot format feature as it does not have any impact on the signal. You can set up any slot format by using Sym. Offset and No. Sym. of the allocations. An auto-setup for specific TDD configurations is planned for the future. | 586029 |
|                  | RF Phase Compensation is switched on by default.                                                                                                                                                                                                                          | 589733 |
|                  | Several improvements for the time plan.                                                                                                                                                                                                                                   | 608680 |
|                  | Showing additional information for allocations.                                                                                                                                                                                                                           | 498183 |
|                  | Support for user defined filters.                                                                                                                                                                                                                                         | 619702 |
|                  | Test model selection can be filtered for easier access.                                                                                                                                                                                                                   | 490776 |
| Uplink           | Improvement for configuration of PRACH time / frequency offsets in case of different PRACH and BWP numerologies.                                                                                                                                                          | 585635 |
|                  | PTRS for PUSCH (with transform precoding).                                                                                                                                                                                                                                | 565942 |
|                  | PTRS for PUSCH (without transform precoding).                                                                                                                                                                                                                             | 565810 |
|                  | Repetitions now also for PRACH.                                                                                                                                                                                                                                           | 616251 |
|                  | Support for special MCS values 29 to 31.                                                                                                                                                                                                                                  | 611710 |
|                  | Support for SRS codebook.                                                                                                                                                                                                                                                 | 565705 |
|                  | Support of PRACH timing offset for 3GPP TS 38.141 tests.                                                                                                                                                                                                                  | 576911 |
|                  | Support overlapping SRS and PUSCH allocations.                                                                                                                                                                                                                            | 594310 |
|                  | Update of FRC assistance function to version 15.2.0 of 38.141-1 and 38.141-2.                                                                                                                                                                                             | 599149 |
| <b>EUTRA/LTE</b> |                                                                                                                                                                                                                                                                           |        |
| Downlink         | Support for 1024QAM.                                                                                                                                                                                                                                                      | 562889 |
|                  | Usability improvement for auto sequence mode "vary UL Tx Power and RBA"                                                                                                                                                                                                   | 201409 |
| General          | All supported features are in line with 3GPP release 15, i.e. the following official 3GPP specifications are implemented: TS36.211 v. 15.6.0, TS36.212 v. 15.6.0, TS36.213 v. 15.6.0.                                                                                     | 597401 |
| Uplink           | Cell ID can be overridden also for eMTC/NB-IoT UEs.                                                                                                                                                                                                                       | 621647 |
|                  | NPRACH for FDD - release 15 extensions.                                                                                                                                                                                                                                   | 569956 |
|                  | Possibility to override the cell ID for individual users.                                                                                                                                                                                                                 | 551041 |
|                  | Support NB-IoT scheduling request by means of release 15 NPUSCH format 2.                                                                                                                                                                                                 | 611628 |
|                  | Support of NB-IoT TDD for uplink.                                                                                                                                                                                                                                         | 540908 |
| <b>GNSS</b>      |                                                                                                                                                                                                                                                                           |        |
|                  | a GNSS specific AWGN configuration is implemented in GNSS Simulation Configuration dialog                                                                                                                                                                                 | 619304 |

| Fixed Issues                                                                                                          |                                                                                                                                                      |        |
|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Common</b>                                                                                                         |                                                                                                                                                      |        |
| Hardcopy                                                                                                              | By default, screen-shots are not saved to USB memory.                                                                                                | 550938 |
|                                                                                                                       | Mouse operation disturbed after touching screen, remote control via VNC does not work as expected.                                                   | 489231 |
| Multi Instrument                                                                                                      | Issue at change of digital standard.                                                                                                                 | 656292 |
| <b>RF</b>                                                                                                             |                                                                                                                                                      |        |
|                                                                                                                       | Erroneous warning for low IQ output voltages                                                                                                         | 585147 |
|                                                                                                                       | In rare cases the error message RFB6.BB: Output unlevelled: Gain Control on Lower Limit appears, if pulse modulation is active.                      | 585193 |
| <b>AM Modulation</b>                                                                                                  |                                                                                                                                                      |        |
|                                                                                                                       | The modulation depth didn't change the PEP value.                                                                                                    | 510310 |
| <b>OFDM Signal Generation</b>                                                                                         |                                                                                                                                                      |        |
|                                                                                                                       | In case the trigger delay unit is set to "time", the delay is not reliably recalculated on sample rate change which can cause a wrong trigger delay. | 617077 |
| <b>5G New Radio</b>                                                                                                   |                                                                                                                                                      |        |
| Downlink                                                                                                              | Automatic creation of PDSCH by DCI does not work in case of more than one BWP.                                                                       | 602915 |
|                                                                                                                       | CSI-RS issue for RB offset != 0.                                                                                                                     | 612362 |
|                                                                                                                       | DCI bit pattern is not reliably updated if other parameters change.                                                                                  | 614630 |
|                                                                                                                       | Firmware instability when configuring the number of SSPBCH patterns.                                                                                 | 617333 |
|                                                                                                                       | For some DCIs, the config dialog is not accessible.                                                                                                  | 601218 |
|                                                                                                                       | In case of activated "restrict to search space", the cce indices are not always recalculated when changing other parameters.                         | 584865 |
|                                                                                                                       | In case of Auto/DCI, allocations cannot be removed from a slot.                                                                                      | 603465 |
|                                                                                                                       | In some cases a DMRS additional position index different than configured is used in the signal generation.                                           | 621896 |
|                                                                                                                       | Issue for CSIRS AP table for certain cases.                                                                                                          | 573489 |
|                                                                                                                       | Issue for CSIRS in case of BWPs with configured RB offset.                                                                                           | 573421 |
|                                                                                                                       | Issue for CSI-RS in case of certain relative powers.                                                                                                 | 610327 |
|                                                                                                                       | Issue for HPN field in DCI 1_1.                                                                                                                      | 625472 |
|                                                                                                                       | Issue for overlapping PDSCHs.                                                                                                                        | 529060 |
|                                                                                                                       | Issue for PDCCH DMRS in case of symbol offset different from 0.                                                                                      | 592219 |
|                                                                                                                       | Issue for PTRS in case of more than one antenna port.                                                                                                | 567693 |
|                                                                                                                       | Issue for some CSI-RS configurations.                                                                                                                | 587078 |
|                                                                                                                       | Issue in case of more than one CSIRS resource.                                                                                                       | 622556 |
| Issue when scheduling PDSCH by means of DCI into other slots than the one the DCI is sent in (cross slot scheduling). | 589499                                                                                                                                               |        |
| Issues for "restrict to search space".                                                                                | 592016                                                                                                                                               |        |



|         |                                                                                                                                                                                 |        |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|         | MCS index range issue in case of MCS table 2.                                                                                                                                   | 590286 |
|         | PTRS issue for certain values of RE offset.                                                                                                                                     | 584064 |
|         | Recall issue for PDCCH CCE index.                                                                                                                                               | 579079 |
|         | SSPBCH kssb issue if SSPBCH SCS is different from common SCS.                                                                                                                   | 570606 |
|         | TBS is not correctly displayed in case of two code words.                                                                                                                       | 613595 |
|         | UI configuration issue for CSI-RS.                                                                                                                                              | 570998 |
|         | UI issue for CSI-RS antenna port table.                                                                                                                                         | 556617 |
|         | UI issue when configuring CSIRS together with PDSCH.                                                                                                                            | 572938 |
|         | UI stability issue when configuring DCIs.                                                                                                                                       | 571696 |
|         | Wrong transport block size in case of PDSCH overlap with SSPBCH or in case of activated rate matching around LTE-CRS.                                                           | 625074 |
| General | For the sample rate variation feature, the sample rate range is unnecessarily restricted on some instrument configurations.                                                     | 619985 |
|         | GUI reacts slowly in cases with several configured allocations.                                                                                                                 | 624670 |
|         | If allocations are configured with state OFF, various read-only information shown for this and subsequent allocations can be corrupt.                                           | 602107 |
|         | In case the trigger delay unit is set to "time", the delay is not recalculated on sample rate change (e.g. in case of channel BW change) which can cause a wrong trigger delay. | 585182 |
|         | Issue for LDPC in case of LBRM.                                                                                                                                                 | 539689 |
|         | Issue for recalling setup files by SCPI.                                                                                                                                        | 586025 |
|         | Issue for TBS calculation in case of activated PTRS or number of CDM groups other than 2.                                                                                       | 596905 |
|         | Issues for custom repetition of allocations. The period is unnecessarily limited.                                                                                               | 579269 |
|         | Issues for some of the "example" test models.                                                                                                                                   | 568430 |
|         | SCPI issues for PTRS configuration.                                                                                                                                             | 629055 |
| Uplink  | Configurable range of SRS resource sets is wrong.                                                                                                                               | 628825 |
|         | Crash for PRACH in specific cases.                                                                                                                                              | 585949 |
|         | Displayed number of symbols for SRS are confusing.                                                                                                                              | 599968 |
|         | For some SRS configurations, unwanted, additional transmissions take place.                                                                                                     | 593969 |
|         | For specific PRACH cases and filter mode "per BWP" the signal calculation fails.                                                                                                | 628999 |
|         | In case of activated FRC, not all depending settings were updated reliably.                                                                                                     | 625464 |
|         | Issue for PRACH in case of different PRACH and BWP numerology.                                                                                                                  | 583271 |
|         | Issue for PRACH in specific cases.                                                                                                                                              | 587495 |
|         | Issue for PUCCH formats 3/4 in case of hopping.                                                                                                                                 | 570401 |
|         | Issue when configuring the PUCCH ACK pattern.                                                                                                                                   | 565903 |
|         | Save/Recall of the filter mode in uplink is not reliable.                                                                                                                       | 630693 |
|         | SRS hopping can be configured although not supported or functional yet.                                                                                                         | 602556 |

|                  |                                                                                                                                                                          |        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                  | Switching off the state of a PRACH allocation does not work.                                                                                                             | 618653 |
|                  | UCI is locked for FRC although needed for some tests.                                                                                                                    | 611091 |
| <b>EUTRA/LTE</b> |                                                                                                                                                                          |        |
| Downlink         | After NB-IoT channel bandwidth change, the signal could be corrupt.                                                                                                      | 589200 |
|                  | In case of NB-IoT the wrong RNTI was used in some cases.                                                                                                                 | 590644 |
|                  | Issue for specific Auto Sequence configurations in case of TDD.                                                                                                          | 594533 |
|                  | NB-IoT carrier RB index is not reliably updated after channel BW change.                                                                                                 | 635586 |
|                  | Not possible to enable NB-IoT NPDSCH channel coding due to a UI issue.                                                                                                   | 577340 |
|                  | Save/recall of NB-IoT channel coding state is unreliable.                                                                                                                | 588583 |
| General          | After NB-IoT channel bandwidth change, the signal might not me updated immediately.                                                                                      | 628614 |
|                  | In case the trigger delay unit is set to "time", the delay is not reliably recalculated on sample rate change which can cause a wrong trigger delay.                     | 617074 |
|                  | Option K112/K412 is additionally needed erroneously for K119 feature special subframe configuration 10.                                                                  | 578154 |
| Test Case Wizard | Applying a test case from the test case wizard also resets some system wide parameters like level offsets or external clock settings, which is not the desired behavior. | 588789 |
| Uplink           | Depending on the order of configuration, the NB-IoT NPUSCH frequency position can be wrong after changing the channel bandwidth.                                         | 630090 |
|                  | Firmware stability issue when configuring LTE uplink.                                                                                                                    | 602306 |
|                  | Issue for inband NB-IoT PRACH preambles.                                                                                                                                 | 580885 |
|                  | On instruments with IoT options but without specific LTE options, uplink users cannot be configured for IoT.                                                             | 625033 |
| <b>NFC</b>       |                                                                                                                                                                          |        |
|                  | Signal is not recalculated after executing set to default.                                                                                                               | 572158 |
| <b>GNSS</b>      |                                                                                                                                                                          |        |
|                  | After several hours simulation time with the hardware limit almost reached, some handover satellites are sporadically not activated.                                     | 537810 |
|                  | Displayed simulation time and the value returned with the command :BB:GNSS:RT:HWT? are inconsistent before trigger or after re-trigger                                   | 517826 |
|                  | If a satellite is not included in an imported Rinex constellation the satellite does not get deactivated.                                                                | 543939 |
|                  | SV relative power offset might lead to an increased noise component in the signal spectrum which could lead to inaccuracies when doing power measurements.               | 571743 |
|                  | For some receivers single Glonass satellites are periodically lost in PVT solution for several seconds.                                                                  | 485775 |
|                  | Glonass satellites are not in fix anymore if turned off and on in realtime.                                                                                              | 451913 |
|                  | When armed and waiting the external trigger, the displayed simulation time starts running although the simulation itself is not yet running.                             | 538753 |
|                  | GLONASS Pseudoranges have inaccuracy of up to 30 cm.                                                                                                                     | 499045 |

|                                                                                                                                                                                           |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Ephemeris/Almanac mismatch when importing RINEX files. It is recommended to set simulation time to RINEX time of applicability before importing or work with YUMA and AGL formats instead | 353005 |
| Issue with P-Code simulation                                                                                                                                                              | 565468 |
| Lower HIL rates cause sometimes unexpected position error.                                                                                                                                | 563110 |
| Inconsistencies in broadcast almanac/ephemeris data after importing constellation from Rinex file.                                                                                        | 505295 |
| SV Logging data does not consider multiple frequency signals.                                                                                                                             | 531663 |

## Known-Issues

### Baseband

|                                                   |        |
|---------------------------------------------------|--------|
| External clock not supported                      |        |
| Marker and IQ/RF-Timing after Trigger not correct | 664675 |

### External Reference

|                                                                                                                                                                               |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| In rare cases the error message 'RFB6.BB: Output unlevelled: Gain Control on Upper Limit' appears if the external reference frequency was switched from external to internal. | 421671 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|

### GNSS

|                                                                                                                                                                                                                                                                                                                                                     |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| In some cases the ARC segment of trajectory files is interpreted with inverted direction, which can lead to inconsistencies in the trajectory.                                                                                                                                                                                                      | 508429 |
| Discontinuities in trajectory sometimes when loading large .kml File                                                                                                                                                                                                                                                                                | 521548 |
| Inconsistencies in logging data for SBAS.                                                                                                                                                                                                                                                                                                           | 491788 |
| With cyclic Waypoints the receiver velocity reported with the SCPI RT:REC:RVELOCITY? UTC,{DateTime} is wrong after the first loop.                                                                                                                                                                                                                  | 538754 |
| Issue with smoothing of trajectories                                                                                                                                                                                                                                                                                                                | 466593 |
| Importing GLONASS Rinex does not synchronize Almanac data. It is recommended to work with AGL files. Ephemeris and Almanac data are also inconsistent when changing the simulation start time.                                                                                                                                                      | 351472 |
| SBAS 'Generate Correction Data Automatically' does not correctly sync with the simulated ionosphere and GPS orbit/clock errors leading to an error of few meters in the position calculated by the receiver when using the SBAS correction service. Instead the 'Replay Historical Data and Sync Atmosphere & SV errors' can be used at the moment. | 240388 |
| The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                                                                                                                                                                                  | 429406 |
| Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.                                                                                                                                                                                                                             | 498094 |
| If start time is just before leap second insertion, the insertion might be omitted in log files.                                                                                                                                                                                                                                                    | 652559 |
| If start time is just before leap second insertion, the insertion might be omitted.                                                                                                                                                                                                                                                                 | 408616 |

## 1.15 Version 4.60.112.22

Released: May 2019

| New Options                                      |  |
|--------------------------------------------------|--|
| R&S® SMBVB-K89 NFC A/B/F                         |  |
| R&S® SMBVB-K131 LORA                             |  |
| R&S® SMBVB-K133 Single-Satellite GNSS            |  |
| R&S® SMBVB-K134 Upgrade to dual-frequency GNSS   |  |
| R&S® SMBVB-K135 Upgrade to triple-frequency GNSS |  |
| R&S® SMBVB-K136 Add 6 GNSS channels              |  |
| R&S® SMBVB-K137 Add 12 GNSS channels             |  |
| R&S® SMBVB-K200 Waveform Package                 |  |
| R&S® SMBVB-K431 LORA with R&S® WinIQSM2          |  |

| New Functionality / Changed Behavior |                                                                                               |        |
|--------------------------------------|-----------------------------------------------------------------------------------------------|--------|
| <b>Common</b>                        |                                                                                               |        |
|                                      | Added multi instrument support.                                                               | 495161 |
| <b>RF</b>                            |                                                                                               |        |
| Sweep                                | Sweep will be switched off in case of considerable overrun conditions.                        | 456033 |
| List Mode                            | List Mode will be switched off in case of considerable overrun conditions.                    | 456033 |
| LF Output                            | A new value Load Impedance in certain emulations.                                             | 542234 |
| <b>Bluetooth</b>                     |                                                                                               |        |
| General                              | Added support for Bluetooth Core Specification Madrid (BT Version 5.1).                       | 511112 |
| <b>5G New Radio</b>                  |                                                                                               |        |
| General                              | Multiple layers/antenna ports are configurable for PDSCH/PUSCH                                | 413014 |
|                                      | Multiple PDSCH/PUSCH antenna ports can be mapped to the baseband output.                      | 413014 |
|                                      | Display BWP overview in the time plan dialog.                                                 | 543264 |
|                                      | Increased maximum number of independently configurable subframes.                             | 519136 |
|                                      | More flexibility for repeating allocations.                                                   | 533576 |
|                                      | Possibility to override DMRS scrambling ID for PDSCH and PUSCH.                               | 413048 |
|                                      | Support for crest factor reduction by means of clipping.                                      | 502232 |
|                                      | Support for more allocations per user, BWP and subframe.                                      | 490799 |
|                                      | Transition time for time domain windowing (WOLA) is also shown in samples.                    | 495138 |
|                                      | Update to 3GPP specifications 38.211 V15.4.0, 38.212 V15.4.0, 38.213 V15.4.0, 38.214 V15.4.0. | 550836 |

|                                  |                                                                                                                                                                                                                                                                                                                           |        |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Downlink                         | Additional RRC parameters which are needed for DCI1_1 PDSCHs.                                                                                                                                                                                                                                                             | 487178 |
|                                  | CSI-RS.                                                                                                                                                                                                                                                                                                                   | 413027 |
|                                  | Optionally restrict CCE indices according to search space.                                                                                                                                                                                                                                                                | 413031 |
|                                  | PDSCH auto generation from DCIs with type 1_1.                                                                                                                                                                                                                                                                            | 413029 |
|                                  | PDSCH auto-creation by means of DCI (Auto-DCI) now also by means of a central switch.                                                                                                                                                                                                                                     | 506176 |
|                                  | Possibility to override PDCCH and PDSCH scrambling reference point in order to behave as if sent in initial BWP / Coreset 0.                                                                                                                                                                                              | 534906 |
|                                  | Support for DCI 0_1 and 1_1.                                                                                                                                                                                                                                                                                              | 413046 |
|                                  | Support for PDSCH PTRS.                                                                                                                                                                                                                                                                                                   | 413025 |
|                                  | Support of both PDCCH precoder granularity modes.                                                                                                                                                                                                                                                                         | 506154 |
|                                  | Support of special behavior for Coreset 0.                                                                                                                                                                                                                                                                                | 541030 |
|                                  | Support SSPBCH L=8 for unpaired spectrum below 3 GHz.                                                                                                                                                                                                                                                                     | 490695 |
|                                  | Test models (NR-FR1-TM) of 38.141-1 V15.0.0.                                                                                                                                                                                                                                                                              | 413033 |
|                                  | Test models (NR-FR2-TM) of 38.141-2 V15.0.0.                                                                                                                                                                                                                                                                              | 503683 |
|                                  | Configurable spare bit in MIB.                                                                                                                                                                                                                                                                                            | 500175 |
|                                  | Possibility to disable channel coding for custom DCI.                                                                                                                                                                                                                                                                     | 504025 |
|                                  | Two codewords can be configured for PDSCH.                                                                                                                                                                                                                                                                                | 413014 |
| UI cleanup for CORESET settings. | 520566                                                                                                                                                                                                                                                                                                                    |        |
| Uplink                           | New parameter for number of SRS antenna ports (needed for PUSCH generation even if SRS itself is not used).                                                                                                                                                                                                               | 508207 |
|                                  | PRACH format 1 cyclic prefix change as of Ran1#94bis.                                                                                                                                                                                                                                                                     | 508973 |
|                                  | Preconfiguration feature for FRCs of TS38.141.                                                                                                                                                                                                                                                                            | 477269 |
|                                  | Support for periodic SRS.                                                                                                                                                                                                                                                                                                 | 413026 |
|                                  | Support of PRACH format 1 changes in 3GPP TS 38.211 V15.4.0.                                                                                                                                                                                                                                                              | 531282 |
| <b>EUTRA/LTE</b>                 |                                                                                                                                                                                                                                                                                                                           |        |
| Downlink                         | ARB sequence length wrap-around for eMTC/NB-IoT PDSCH generated by PDCCH cross-subframe scheduling.                                                                                                                                                                                                                       | 476050 |
|                                  | Narrowband Positioning Reference Signal (NPRS) is supported.                                                                                                                                                                                                                                                              | 469677 |
|                                  | Support of Gap configuration for NB-IoT (DL-GapConfig-NB-r13 in TS 36.331).                                                                                                                                                                                                                                               | 310945 |
| Uplink                           | SRS transmission in UpPTS for special subframe configuration 10 (fallback to special subframe configuration 5).                                                                                                                                                                                                           | 501145 |
|                                  | Support for FRCs 18 and 19 of 3GPP TS 36.141.                                                                                                                                                                                                                                                                             | 508589 |
| <b>GNSS</b>                      |                                                                                                                                                                                                                                                                                                                           |        |
|                                  | The R&S®SMBVB has now the capability to perform multi-frequency GNSS simulations in the frequency bands L1, L2 and L5. Thus it offers a flexible and scalable test solution with a clear upgrade path, starting from using simple GNSS waveforms up to simulating complex multi-constellation, multi-frequency scenarios. | 498019 |
|                                  | The Galileo E1-B SAR bits are configurable                                                                                                                                                                                                                                                                                | 550724 |
|                                  | The Subband Partitioning has changed                                                                                                                                                                                                                                                                                      | 543930 |

| Fixed Issues        |                                                                                                                                                                                                                  |        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Common</b>       |                                                                                                                                                                                                                  |        |
| General             | Slide switches can be operated in remote state.                                                                                                                                                                  | 501226 |
| Internal Adjustment | Improved Table Adjustment. Internal Adjustments have to be done.                                                                                                                                                 | 562367 |
| Remote Control      | Error handling: SYSTEM:SEERROR? delivers info-messages, different from SYSTEM:ERROR?                                                                                                                             | 555983 |
| <b>RF</b>           |                                                                                                                                                                                                                  |        |
| AM modulation       | The RF level is higher than expected.                                                                                                                                                                            | 510294 |
| RF Level Sweep      | In rare cases the level steps are different.                                                                                                                                                                     | 542768 |
| Pulse Generator     | The trigger mode 'Ext Single' doesn't work.                                                                                                                                                                      | 522691 |
| <b>ARB</b>          |                                                                                                                                                                                                                  |        |
| General             | In mode Armed Auto the external global trigger delay limits are not consistent between the different units.                                                                                                      | 477362 |
| <b>IQ Modulator</b> |                                                                                                                                                                                                                  |        |
|                     | <p>Toggleing of the IQ modulator state will leads the error message General Database Error, if no SMBVB-K90 is installed.</p> <p>Output level too high after local IQ adjustment in high quality mode for 3s</p> | 568123 |
|                     |                                                                                                                                                                                                                  | 553138 |
| <b>5G New Radio</b> |                                                                                                                                                                                                                  |        |
| General             | Filter mode per BWP can cause an unnecessarily high sample rate.                                                                                                                                                 | 501799 |
|                     | Issue for antenna port tables in case of more than one BWP.                                                                                                                                                      | 558600 |
|                     | Issue for channel bandwidth SCPI command.                                                                                                                                                                        | 510987 |
|                     | Issue in polar channel coding. For certain parameters of polar coding, the coding can be wrong.                                                                                                                  | 554545 |
|                     | Levelling issue for power mode Contant PSD with very high or low reference system bandwidths.                                                                                                                    | 549931 |
|                     | On Save/Recall the firmware could have crashed.                                                                                                                                                                  | 553370 |
|                     | PDSCH/PUSCH-DMRS is not set correctly for cases, where AddPosIdx != 0 and MappingTypeA is selected.                                                                                                              | 508847 |
|                     | Possible crash when loading Save/Recall file.                                                                                                                                                                    | 550832 |
|                     | Sporadic save/recall issues.                                                                                                                                                                                     | 546084 |
|                     | Stability issue when increasing the number of users.                                                                                                                                                             | 525301 |
|                     | Strange GUI behavior when entering the phase precompensation frequency.                                                                                                                                          | 504116 |
| Downlink            | The maximum configurable playback rate is incorrect in some cases.                                                                                                                                               | 450130 |
|                     | Coreset scrambling ID is shown as 0 even if Cell ID is used (only in GUI, signal uses Cell ID).                                                                                                                  | 504701 |
|                     | DCI CCE index is not updated after changing other CORESET parameters.                                                                                                                                            | 551766 |
|                     | DCI issues in case of more than one user or more than one BWP.                                                                                                                                                   | 543022 |

|                  |                                                                                                       |        |
|------------------|-------------------------------------------------------------------------------------------------------|--------|
|                  | Issue for Number of UL BWPs parameter in case of more than one user.                                  | 530990 |
|                  | Issue for PBCH DMRS in case of BPCH relative power different from 0 dB.                               | 550510 |
|                  | Issue for SSB scrambling for index > 7.                                                               | 516374 |
|                  | Issue in case of overlapping CSI-RS and PDSCH with Symbol Offset >0                                   | 559873 |
|                  | PDSCH DMRS power is not set correctly in case of CDM groups change.                                   | 504396 |
|                  | Some SSPBCH periodicities missing.                                                                    | 501942 |
|                  | Issue for DCI antenna port field.                                                                     | 523047 |
|                  | DCI content is not reliably updated when changing general or BWP parameters.                          | 509748 |
|                  | Save Recall issue for custom DCI bit data length.                                                     | 504325 |
|                  | Issue for DCI 1_0.                                                                                    | 509794 |
|                  | Value range issue for SSPBCH RB offset in case of mode "to point A".                                  | 505631 |
|                  | Sometimes the SSPBCH is removed from the configuration unnecessarily if other parameters are changed. | 512885 |
| Uplink           | Issue for PRACH formats 0, 1, 2, 3.                                                                   | 523386 |
|                  | Issue for PUCCH in case of more than one BWP.                                                         | 528399 |
|                  | Issue for PUSCH UCI in case of more than one BWP.                                                     | 528319 |
|                  | Issue for PUSCH with multiplexed USCH and UCI.                                                        | 550484 |
|                  | Issue for UCI on PUSCH.                                                                               | 531295 |
|                  | UI issues for resulting PRACH allocations.                                                            | 559859 |
|                  | Save/Recall issue for PUCCH format 3 ACK bits.                                                        | 500156 |
|                  | Issue for PUSCH UCI.                                                                                  | 503385 |
|                  | Issue for PUSCH UCI in case of transform precoding.                                                   | 520567 |
|                  | User interface issues for PRACH configuration.                                                        | 536551 |
| <b>EUTRA/LTE</b> |                                                                                                       |        |
| General          | An error can show up when recalling specific eMTC/Cat-M settings from file.                           | 569977 |
| Test Case Wizard | After applying a test case, the TC selection switches back to default.                                | 525582 |
| Downlink         | Issue that Unused Resource elements are not filled with Dummy Data in NB-IoT Standalone Mode.         | 428920 |
| Uplink           | Firmware crashes when using sidelink synchronization for V2X communication.                           | 558192 |
|                  | Stability issue for sidelink SCI config.                                                              | 513220 |
|                  | The DMRS sequence generation is wrong in some cases for enhanced DMRS                                 | 524828 |
|                  | The power leveling is wrong for some configurations with SSF = 10                                     | 521370 |
|                  | V2X is erroneously only possible with K113/K413 option.                                               | 518241 |
| <b>GNSS</b>      |                                                                                                       |        |

|                                                                                                                                                                                                                                                          |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Galileo satellites with SVID > 30 cannot be simulated.                                                                                                                                                                                                   | 505573 |
| Re-triggering after changing the states of individual SVs causes FIFO Underruns errors                                                                                                                                                                   | 501947 |
| Instabilities when using Re-trigger modes. Automatic or single triggering is recommended after the simulation is started.                                                                                                                                | 511565 |
| Issue with simulating leap seconds                                                                                                                                                                                                                       | 511314 |
| If a maximum satellite constraint is set, it could happen that no new satellites are turned on after satellites are disappearing. As a workaround, please do not use the maximum satellite constraint feature.                                           | 542328 |
| Issue in simulating GPS week roll over                                                                                                                                                                                                                   | 511315 |
| Power calculation issue                                                                                                                                                                                                                                  | 512348 |
| Replaced command error when recall settings via SCPI                                                                                                                                                                                                     | 563358 |
| The simulated receiver position does not update in the map view while the simulation is running, although the coordinate are correctly displayed. Similarly the Map preview does not update when a waypoint file is loaded until the dialog is reopened. | 514830 |
| Galileo might show Almanac vs. Ephemeris inconsistencies in some cases when the constellation is imported from external files.                                                                                                                           | 497558 |
| GAGAN sends wrong provider ID                                                                                                                                                                                                                            | 548026 |
| Incorrect simulation of Ionosphere carrier advance as rather a delay.                                                                                                                                                                                    | 346612 |
| Iono delay variation after simulation start is incorrect on L2 and L5 signals                                                                                                                                                                            | 528484 |
| SV-Config flag broadcasts no GPS L5 capability on LNAV. This might lead to tracking issues in some receivers.                                                                                                                                            | 533228 |

## Known-Issues

|                                                                                                                                                |        |
|------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| SMBVB-K540 Envelop Tracking: The differential voltage is negative, if Vpp greater than 1V                                                      |        |
| Baseband Digital Input (BBIN):Not supported                                                                                                    | 412075 |
| Baseband: External clock not supported                                                                                                         |        |
| When using AWGN in combination with multi-frequency GNSS, any settings done in the AWGN will not have an effect.                               | 580929 |
| GNSS                                                                                                                                           |        |
| After several hours simulation time with the hardware limit almost reached, some handover satellites are sporadically not activated.           | 537810 |
| If a satellite is not included in an imported Rinex constellation the satellite does not get deactivated.                                      | 543939 |
| In some cases the ARC segment of trajectory files is interpreted with inverted direction, which can lead to inconsistencies in the trajectory. | 508429 |
| Inconsistencies in broadcast almanac/ephemeris data after importing constellation from Rinex file.                                             | 505295 |
| Inconsistencies in logging data for SBAS.                                                                                                      | 491788 |
| Rinex files generated with Assistance Data Generation contain tab characters which is not Rinex Spec. compliant.                               | 465018 |



|                                                                                                                                                                                                                                                                                                                                                     |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Ephemeris/Almanac mismatch when importing RINEX files. It is recommended to set simulation time to RINEX time of applicability before importing or work with YUMA and AGL formats instead                                                                                                                                                           | 353005 |
| The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                                                                                                                                                                                  | 429406 |
| Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.                                                                                                                                                                                                                             | 498094 |
| Displayed simulation time and the value returned with the command :BB:GNSS:RT:HWT? are inconsistent before trigger or after re-trigger                                                                                                                                                                                                              | 517826 |
| For some receivers single Glonass satellites are periodically lost in PVT solution for several seconds.                                                                                                                                                                                                                                             | 485775 |
| Glonass satellites are not in fix anymore if turned off and on in realtime.                                                                                                                                                                                                                                                                         | 451913 |
| With cyclic Waypoints the receiver velocity reported with the SCPI RT:REC:RVELOCITY? UTC,{DateTime} is wrong after the first loop.                                                                                                                                                                                                                  | 538754 |
| Importing GLONASS Rinex does not synchronize Almanac data. It is recommended to work with AGL files. Ephemeris and Almanac data are also inconsistent when changing the simulation start time.                                                                                                                                                      | 351472 |
| SBAS 'Generate Correction Data Automatically' does not correctly sync with the simulated ionosphere and GPS orbit/clock errors leading to an error of few meters in the position calculated by the receiver when using the SBAS correction service. Instead the 'Replay Historical Data and Sync Atmosphere & SV errors' can be used at the moment. | 240388 |
| GPS L2 P-Code carrier phase issue in tracking mode.                                                                                                                                                                                                                                                                                                 | 555671 |

## 1.16 Version 4.50.074.45

Released: Dezember 2018

| New Options                                     |
|-------------------------------------------------|
| R&S® SMBVB-K44 GPS                              |
| R&S® SMBVB-K66 Galileo                          |
| R&S® SMBVB-K80 Bit Error Rate Tester            |
| R&S® SMBVB-K94 Glonass                          |
| R&S® SMBVB-K98 Modernized GPS                   |
| R&S® SMBVB-K99 GNSS channel extension to 24 ch. |
| R&S® SMBVB-K106 SBAS/QZSS                       |
| R&S® SMBVB-K107 BeiDou                          |
| R&S® SMBVB-K108 GNSS Real World simulation      |
| R&S® SMBVB-K109 GNSS Realtime interface         |
| R&S® SMBVB-K111 GBAS                            |
| R&S® SMBVB-K143 Cellular IoT Enhancements       |
| R&S® SMBVB-K151 ILS                             |

|                                                              |
|--------------------------------------------------------------|
| R&S® SMBVB-K152 VOR                                          |
| R&S® SMBVB-K153 DME                                          |
| R&S® SMBVB-K298 Modernized GPS with R&S® WinIQSIM2           |
| R&S® SMBVB-K360 eraGlonass Test Suite                        |
| R&S® SMBVB-K361 eCall Test Suite                             |
| R&S® SMBVB-K362 GNSS Test Suite                              |
| R&S® SMBVB-K431 LORA with R&S® WinIQSM2                      |
| R&S® SMBVB-K443 Cellular IoT Enhancements with R&S® WinIQSM2 |

## New Functionality / Changed Behavior

### Common

|  |                                                                                    |        |
|--|------------------------------------------------------------------------------------|--------|
|  | Support of Equipment Configuration Viewer.                                         | 431146 |
|  | Consecutive identical messages are bundled in info history and SCPI message queue. | 455946 |

### Remote Control Emulation

|  |                                                       |        |
|--|-------------------------------------------------------|--------|
|  | Added Emulations for Keysight EXG Generators (N517x). | 419485 |
|--|-------------------------------------------------------|--------|

### RF

|           |                                                              |        |
|-----------|--------------------------------------------------------------|--------|
| General   | Activated internal level limits for frequencies below 1 MHz. | 465312 |
| List Mode | The minimal dwell time has been reduced to 1 ms              | 455790 |
| Sweep     | The minimal dwell time has been reduced to 1 ms              | 455790 |

### Bluetooth

|  |                                                                |        |
|--|----------------------------------------------------------------|--------|
|  | Enable all advertising packet types for dirty transmitter test | 445966 |
|--|----------------------------------------------------------------|--------|

### 3GPP

|        |                                                                                      |        |
|--------|--------------------------------------------------------------------------------------|--------|
| Uplink | Discontinued EDPDCH overall symbol rate modes are still shown in the user interface. | 452691 |
|--------|--------------------------------------------------------------------------------------|--------|

### 5G New Radio

|         |                                                                                                                                                                                                       |        |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| General | CDM Groups w/o data for PDSCH and PUSCH.                                                                                                                                                              | 473710 |
|         | Displaying the BWP offset also relative to PointA, not only to the first usable RB of a TxBW.                                                                                                         | 448033 |
|         | DMRS power is configurable in PDSCH/PUSCH settings.                                                                                                                                                   | 497004 |
|         | Dummy REs are now switched off by default.                                                                                                                                                            | 461120 |
|         | Filter mode replaces filter per BWP switch.                                                                                                                                                           | 446862 |
|         | Increased maximum number of allocations per user and BWP.                                                                                                                                             | 424206 |
|         | Moved PDSCH-DMRS / PUSCH-DMRS Settings from PDSCH / PUSCH Settings to BWP Config Settings dialogues. (SCPI commands have been changed).                                                               | 473738 |
|         | Optionally suppress subcarrier on output center.                                                                                                                                                      | 444569 |
|         | Some PDSCH/PUSCH RRC parameters have been moved from the allocations to a more central place. Note that this causes a SCPI/Recall incompatibility for these parameters compared to previous versions. | 487422 |

|                                                                                                      |                                                                                                                                                                                       |        |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                                                                                                      | Support for sample rate variation.                                                                                                                                                    | 458325 |
|                                                                                                      | Support of additional power modes.                                                                                                                                                    | 486383 |
|                                                                                                      | The RF upconverter phase rotation can optionally be included in the baseband signal calculation.                                                                                      | 459477 |
|                                                                                                      | Update to 3GPP specifications 38.211 V15.2.0, 38.212 V15.2.0, 38.213 V15.2.0, 38.214 V15.2.0.                                                                                         | 457457 |
|                                                                                                      | Support for time-domain-windowing (WOLA)                                                                                                                                              | 413042 |
| Downlink                                                                                             | A carrier can be marked for usage as SUL (impacts DCI contents).                                                                                                                      | 489656 |
|                                                                                                      | LDPC channel coding for PDSCH.                                                                                                                                                        | 413018 |
|                                                                                                      | MIB content in PBCH.                                                                                                                                                                  | 413047 |
|                                                                                                      | Optionally configure SSPBCH frequency domain position relatively to point A.                                                                                                          | 485169 |
|                                                                                                      | SSPBCH can be switched off.                                                                                                                                                           | 467786 |
|                                                                                                      | Support for DCIs 0_0 and 1_0, channel coded "custom" DCIs and PDSCH auto generation for DCI 1_0.                                                                                      | 491953 |
| Uplink                                                                                               | LDPC channel coding for PUSCH (USCH only).                                                                                                                                            | 450594 |
|                                                                                                      | Support for PRACH channel.                                                                                                                                                            | 413020 |
|                                                                                                      | Support for PUCCH.                                                                                                                                                                    | 413037 |
|                                                                                                      | Support for PUSCH UCI.                                                                                                                                                                | 413019 |
|                                                                                                      | Updated DMRS for transform precoding to recent 3GPP specification.                                                                                                                    | 457435 |
| <b>EUTRA/LTE</b>                                                                                     |                                                                                                                                                                                       |        |
| General                                                                                              | All supported features are in line with 3GPP release 14, i.e. the following official 3GPP specifications are implemented: TS36.211 v. 14.7.0, TS36.212 v. 14.6.0, TS36.213 v. 14.7.0. | 463544 |
|                                                                                                      | First version to support options K143/K443 (Cellular IoT Enhancements).                                                                                                               | 344011 |
| Downlink                                                                                             | Changed BCCH-NPDSCH scrambling according to recent specifications. The previous scrambling is still supported in a legacy mode.                                                       | 457484 |
|                                                                                                      | DCI support for NB-IoT with two HARQ processes.                                                                                                                                       | 446241 |
|                                                                                                      | 'LTE Cell' is added to switch the LTE carriers on and off, in NB-IoT Inband Mode.                                                                                                     | 444914 |
|                                                                                                      | Manual Scheduling is supported for NPDSCH in NB-IoT DL.                                                                                                                               | 439629 |
|                                                                                                      | New UE categories according to recent versions of the specification (UE categories 15 to 20).                                                                                         | 460596 |
|                                                                                                      | PDSCH-SIB1-BR channel is supported for eMTC Downlink.                                                                                                                                 | 392071 |
|                                                                                                      | Time Plan is added for PDSCH-SIB1-BR in eMTC DL.                                                                                                                                      | 456441 |
|                                                                                                      | Transport Block Size Indexes are increased from 10 to 13 for Standalone and Guardband modes for NB-IoT.                                                                               | 442005 |
|                                                                                                      | UE Categories M2 and NB2 are added for eMTC and NB-IoT Respectively.                                                                                                                  | 459516 |
| Widebands support for eMTC with 5MHz and 20MHz. DCI support for eMTC Resource Block Assignment Flag. | 469643                                                                                                                                                                                |        |
| Uplink                                                                                               | Enhanced DMRS for PUSCH                                                                                                                                                               | 321584 |

|  |                                                                               |        |
|--|-------------------------------------------------------------------------------|--------|
|  | NPUSCH Repetitions 2,16,64 are supported for FRCs in NB-IoT Uplink.           | 406202 |
|  | PUSCH Repetitions 12, 24 and PUCCH Repetitions 64,128 are supported for eMTC. | 410032 |
|  | Retuning symbols 0,1 and 2 are supported for eMTC.                            | 423104 |
|  | Sidelink/D2D                                                                  | 137923 |
|  | SRS is supported for eMTC Uplink.                                             | 431974 |
|  | Time plan for sidelink.                                                       | 450619 |
|  | V2X support.                                                                  | 423563 |
|  | Widebands of 5MHz and 20MHz are supported for eMTC.                           | 411212 |
|  | Support of PRACH Restricted Set B                                             | 440747 |
|  | Repetitions 4,8,32 are supported for PUCCH Format2 in eMTC CEMode B.          | 435157 |

## Fixed Issues

### Common

|                                     |                                                                                                                                                                                     |        |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                                     | No symbol clock output on USER connectors.                                                                                                                                          | 465368 |
|                                     | The threshold level and impedance are affect to the wrong USER connectors.                                                                                                          | 500565 |
|                                     | Changes of the USER connectors only have an effect, if the state was changed from OFF to ON of the digital standard.                                                                | 500572 |
|                                     | For some digital standards global save by means of :SYST:SAV remote control command does not work. Manual operation and *SAV & MMEM:STOR:STAT remote control commands however work. | 494528 |
| Remote Control                      | After viClear remote connection via USB not working.                                                                                                                                | 380954 |
| UCOR                                | After executing 'Fill UCOR data with sensor' error messages occurs twice.                                                                                                           | 422497 |
|                                     | The correction value doesn't have an effect.                                                                                                                                        | 458407 |
| <b>ARB</b>                          |                                                                                                                                                                                     |        |
| General                             | Binary control list marker output not working for very large waveform files.                                                                                                        | 498322 |
|                                     | Marker modes Pulse, Pattern and On/Off Ratio did not work on markers 2 and 3 with multi segment waveforms.                                                                          | 504385 |
|                                     | Waveform files transferred by SCPI may be clipped to 64MSamples or 256MByte due to unintended internal limitation.                                                                  | 445788 |
|                                     | K6 (DFS) encrypted waveforms are not accepted.                                                                                                                                      | 465613 |
| Multi Carrier                       | Multicarrier calculation performs a narrowband filtering of input waveform files.                                                                                                   | 46955  |
|                                     | Clock Rate and file size are not displayed accordingly.                                                                                                                             | 45382  |
| <b>IQ Modulator</b>                 |                                                                                                                                                                                     |        |
|                                     | An error message appears, if 'Adjust I/Q Modulator current frequency' is executed an no baseband signal available.                                                                  | 452783 |
| <b>External Reference Frequency</b> |                                                                                                                                                                                     |        |

|                     |                                                                                                                                                                                                                                                  |        |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                     | In rare cases the error message 'RFB6.BB: Output unlevelled: Gain Control on Upper Limit' appears if the external reference frequency was switched from external to internal.                                                                    | 421671 |
| <b>AWGN</b>         |                                                                                                                                                                                                                                                  |        |
|                     | Spurs appear in the signal outside the noise spectrum for some cases with higher noise system bandwidth.                                                                                                                                         | 477966 |
| <b>5G New Radio</b> |                                                                                                                                                                                                                                                  |        |
| General             | Displayed playback rate is not always correct                                                                                                                                                                                                    | 446997 |
|                     | Issue for multi numerology scenarios.                                                                                                                                                                                                            | 451083 |
|                     | Issue when using long ARB sequences.                                                                                                                                                                                                             | 467956 |
|                     | Issues with overlapping allocations and different numerologies.                                                                                                                                                                                  | 442044 |
|                     | k0u value is not updated on PointA reconfiguration.                                                                                                                                                                                              | 470614 |
|                     | PDSCH/PUSCH bit mapping issue.                                                                                                                                                                                                                   | 462615 |
|                     | Saving setup files from older firmware versions sometimes does not work. Note that although saving settings is fixed with this firmware, recalling files from earlier versions still can cause error messages as the files itself are corrupted. | 474969 |
|                     | SCPI bug for PDSCH/PUSCH DMRS config type.                                                                                                                                                                                                       | 455112 |
|                     | Stability issue in case of configuring several BWPs.                                                                                                                                                                                             | 479873 |
|                     | Test model name is shown even after changing parameters.                                                                                                                                                                                         | 445219 |
|                     | Trigger delay does not work if unit "time" is used. Also, shown "Actual trigger delay" is wrong.                                                                                                                                                 | 450537 |
|                     | UI inconvenience issue when configuring PDSCH / PUSCH allocations.                                                                                                                                                                               | 456883 |
|                     | 5GNR: General: When changing an allocation's content, the configured repetition is reset, which is not desired.                                                                                                                                  | 495072 |
| Downlink            | 5GNR: Downlink: Content type inconsistency when increasing the number of allocations.                                                                                                                                                            | 476470 |
|                     | Issue for PBCH payload generation.                                                                                                                                                                                                               | 475741 |
|                     | Issue for PDCCH DMRS in case of interleaved CCE-to-REG mapping.                                                                                                                                                                                  | 453393 |
|                     | PBCH payload size has to be 32 bits but is only 31 bits.                                                                                                                                                                                         | 451005 |
|                     | Signal quality issue in case of SSPBCH with different subcarrier spacing than surrounding channels.                                                                                                                                              | 485157 |
|                     | Wrong range of CORESET DMRS scrambling ID.                                                                                                                                                                                                       | 497956 |
| Uplink              | Calculation aborts with error in case of transform precoding and more than one configured allocation per subframe.                                                                                                                               | 501223 |
|                     | Incorrect DMRS power boosting for PUSCH transform precoding.                                                                                                                                                                                     | 472637 |
|                     | Issue for BPSK.                                                                                                                                                                                                                                  | 462301 |
|                     | Issue for PUSCH RB number, if transform precoding is enabled.                                                                                                                                                                                    | 455965 |
|                     | Issue with exemplary test model for transmit precoding.                                                                                                                                                                                          | 466469 |
| <b>EUTRA/LTE</b>    |                                                                                                                                                                                                                                                  |        |
| General             | Changing the filter settings does not affect the signal in some cases                                                                                                                                                                            | 418550 |
| Test Case Wizard    | Trigger configuration does not work.                                                                                                                                                                                                             | 453070 |

|                                                                                                              |                                                                                                                                          |        |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Downlink                                                                                                     | Crash in case of PDSCH scheduling mode "auto sequence".                                                                                  | 456243 |
|                                                                                                              | EPDCCH issue in special subframe.                                                                                                        | 482602 |
|                                                                                                              | Instability when configuring NB-IoT DCIs.                                                                                                | 471735 |
|                                                                                                              | Issue with PBCH state when switching between LTE and IoT modes.                                                                          | 470189 |
|                                                                                                              | Issue with SIB1-NB scheduling repetitions.                                                                                               | 428630 |
|                                                                                                              | Minor fix for the time plan                                                                                                              | 486897 |
|                                                                                                              | Minor issue for DCI when DMRS Alternative Table is used                                                                                  | 462116 |
|                                                                                                              | PDCCH issue on SCeLLs in case of mixed TDD/FDD carrier aggregation.                                                                      | 465540 |
|                                                                                                              | Remote control issue for high numbers of NB-IoT DCIs.                                                                                    | 469427 |
|                                                                                                              | Scrambling issue for NB-IoT SIB1.                                                                                                        | 479447 |
|                                                                                                              | The OCC sequence is wrong if the case of single AP transmission.                                                                         | 453460 |
|                                                                                                              | Wrong RNTI for NB-IoT NB-SIB1.                                                                                                           | 477179 |
|                                                                                                              | When Puncturing is switched on, LTE CRS signals are erroneously punctured in the NB-IoT Inband Mode.                                     | 431074 |
|                                                                                                              | The range of the field "HARQ Process number" in DCI Format 6-1A is wrong                                                                 | 434051 |
| Uplink                                                                                                       | Changes in eMTC PRACH Restricted Set parameter sometimes do not change the signal immediately, but after changing another LTE parameter. | 473873 |
|                                                                                                              | GUI issue for eMTC start subframe.                                                                                                       | 457280 |
|                                                                                                              | Inconsistent default values of eMTC transport block size.                                                                                | 482647 |
|                                                                                                              | Issue for slot numbers for FRCs for NB-IoT.                                                                                              | 450040 |
|                                                                                                              | Leveling in power reference mode "UE Burst RMS Power" is not reliable in case of filter optimization mode different from "Best EVM".     | 494484 |
|                                                                                                              | The DMRS are wrong when ul-DMRS-IFDMA is set.                                                                                            | 485984 |
|                                                                                                              | The mapping of SRS is wrong when 4 SRS Combs are configured.                                                                             | 454278 |
|                                                                                                              | The power leveling is wrong in case of longer UpPTS for SRS                                                                              | 460935 |
|                                                                                                              | UI issue for cell selection combo boxes.                                                                                                 | 460699 |
| When special subframe configuration 10 is configured, no PUCCH allocation can be configured in UL subframes. | 489953                                                                                                                                   |        |

### Known-Issues

|                                                                                           |        |
|-------------------------------------------------------------------------------------------|--------|
| SMBVB-K540 Envelop Tracking: The differential voltage is negative, if Vpp greater than 1V |        |
| Baseband Digital Input (BBIN):Not supported                                               | 412075 |
| Multi Instrument: Not supported                                                           | 495161 |
| Baseband: External clock not supported                                                    |        |

### GNSS

|  |                                                                                                                                                                                                                                                                                                                                                     |        |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  | GLONASS Pseudoranges have inaccuracy of up to 30 cm.                                                                                                                                                                                                                                                                                                | 499045 |
|  | Instabilities when using Re-trigger modes. Automatic or single triggering is recommended after the simulation is started.                                                                                                                                                                                                                           | 511565 |
|  | Issue with simulating leap seconds                                                                                                                                                                                                                                                                                                                  | 511314 |
|  | Issue in simulating GPS week roll over                                                                                                                                                                                                                                                                                                              | 511315 |
|  | Ephemeris/Almanac mismatch when importing RINEX files. It is recommended to set simulation time to RINEX time of applicability before importing or work with YUMA and AGL formats instead                                                                                                                                                           | 353005 |
|  | Galileo might show Almanac vs. Ephemeris inconsistencies in some cases when the constellation is imported from external files.                                                                                                                                                                                                                      | 497558 |
|  | Importing GLONASS Rinex does not synchronize Almanac data. It is recommended to work with AGL files. Ephemeris and Almanac data are also inconsistent when changing the simulation start time.                                                                                                                                                      | 351472 |
|  | SBAS "Generate Correction Data Automatically" does not correctly sync with the simulated ionosphere and GPS orbit/clock errors leading to an error of few meters in the position calculated by the receiver when using the SBAS correction service. Instead the "Replay Historical Data and Sync Atmosphere & SV errors" can be used at the moment. | 240388 |
|  | The body mask and antenna pattern editors assume a flipped direction of the z-axis                                                                                                                                                                                                                                                                  | 429406 |

## 1.17 Version 4.30.060.18

Released: June 2018

### New Options

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

R&S® SMBVB-B1 OCXO Reference Oscillator

R&S® SMBVB-B1H OCXO Reference Oscillator, High Performance

R&S® SMBVB-B3 100 MHz, 1 GHz Ultra Low Noise Reference Input/Output

R&S® SMBVB-B32 Ultra High Output Power

R&S® SMBVB-B80 Removable Mass Storage

R&S® SMBVB-B81 Rear Panel Connector for RF Path

R&S® SMBVB-KB106 Frequency Extension to 6 GHz

R&S® SMBVB-K17 Differential Analog I/Q outputs

R&S® SMBVB-K22 Pulse Modulator

R&S® SMBVB-K23 Pulse Generator

R&S® SMBVB-K24 Multifunction Generator

R&S® SMBVB-K31 High Output Power

R&S® SMBVB-K40 GSM/EDGE

R&S® SMBVB-K41 EDGE Evolution

R&S® SMBVB-K42 3GPP FDD

|                                                          |
|----------------------------------------------------------|
| R&S® SMBVB-K46 CDMA2000®                                 |
| R&S® SMBVB-K47 1xEV-DO                                   |
| R&S® SMBVB-K50 TD-SCDMA                                  |
| R&S® SMBVB-K51 TD-SCDMA Enhanced BS/MS Tests             |
| R&S® SMBVB-K54 IEEE 802.11a/b/g/n                        |
| R&S® SMBVB-K55 EUTRA/LTE                                 |
| R&S® SMBVB-K60 Bluetooth® EDR                            |
| R&S® SMBVB-K61 Multicarrier CW Signal Generation         |
| R&S® SMBVB-K62 Additive White Gaussian Noise (AWGN)      |
| R&S® SMBVB-K83 3GPP FDD HSPA/HSPA+, Enhanced BS/MS Tests |
| R&S® SMBVB-K84 EUTRA/LTE Release 9 and Enhanced Features |
| R&S® SMBVB-K85 EUTRA/LTE Release 10 (LTE-Advanced)       |
| R&S® SMBVB-K86 IEEE 802.11 ac                            |
| R&S® SMBVB-K87 1xEV-DO Rev. B                            |
| R&S® SMBVB-K90 Phase Coherence                           |
| R&S® SMBVB-K112 LTE Release 11 and Enhanced Features     |
| R&S® SMBVB-K113 EUTRA/LTE Release 12                     |
| R&S® SMBVB-K114 OFDM Signal Generation                   |
| R&S® SMBVB-K115 Cellular IoT                             |
| R&S® SMBVB-K117 Bluetooth® 5.0                           |
| R&S® SMBVB-K119 LTE Release 13 and 14                    |
| R&S® SMBVB-K142 IEEE 802.11 ax                           |
| R&S® SMBVB-K144 5G NR                                    |
| R&S® SMBVB-K240 GSM/EDGE                                 |
| R&S® SMBVB-K241 EDGE Evolution                           |
| R&S® SMBVB-K242 3GPP FDD                                 |
| R&S® SMBVB-K244 GPS                                      |
| R&S® SMBVB-K246 CDMA2000®                                |
| R&S® SMBVB-K247 1xEV-DO Rev A                            |
| R&S® SMBVB-K250 TD-SCDMA                                 |
| R&S® SMBVB-K251 TD-SCDMA Enhanced BS/MS Tests            |
| R&S® SMBVB-K252 DVB-H                                    |
| R&S® SMBVB-K253 DAB/T-DMB                                |
| R&S® SMBVB-K254 IEEE 802.11a/b/g/n                       |
| R&S® SMBVB-K255 EUTRA/LTE                                |
| R&S® SMBVB-K260 Bluetooth® EDR                           |
| R&S® SMBVB-K261 Multicarrier CW Signal Generation        |
| R&S® SMBVB-K262 Additive White Gaussian Noise (AWGN)     |



|                                                                |
|----------------------------------------------------------------|
| R&S® SMBVB-K266 Galileo                                        |
| R&S® SMBVB-K283 3GPP FDD HSPA/HSPA+, Enhanced BS/MS Tests      |
| R&S® SMBVB-K284 EUTRA/LTE Release 9 and Enhanced Features      |
| R&S® SMBVB-K285 EUTRA/LTE Release 10 (LTE-Advanced)            |
| R&S® SMBVB-K286 IEEE 802.11ac                                  |
| R&S® SMBVB-K287 1xEV-DO Rev. B                                 |
| R&S® SMBVB-K289 NFC A/B/F                                      |
| R&S® SMBVB-K294 Glonass 1 Satellite                            |
| R&S® SMBVB-K298 Modernized GPS                                 |
| R&S® SMBVB-K300 Pulse Sequencing                               |
| R&S® SMBVB-K301 Enhanced Pulse Sequencing                      |
| R&S® SMBVB-K308 DF                                             |
| R&S® SMBVB-K350 DFS Signal Generation                          |
| R&S® SMBVB-K407 Beidou                                         |
| R&S® SMBVB-K412 LTE Release 11 and Enhanced Features           |
| R&S® SMBVB-K413 EUTRA/LTE Release 12                           |
| R&S® SMBVB-K414 OFDM Signal Generation                         |
| R&S® SMBVB-K415 Cellular IoT                                   |
| R&S® SMBVB-K416 DVB-S2/DVB-S2X                                 |
| R&S® SMBVB-K417 Bluetooth® 5.0                                 |
| R&S® SMBVB-K418 Verizon 5GTF Signals                           |
| R&S® SMBVB-K419 LTE Release 13 and 14                          |
| R&S® SMBVB-K442 IEEE 802.11ax                                  |
| R&S® SMBVB-K511 ARB memory Extension to 512 Msample            |
| R&S® SMBVB-K512 ARB memory Extension to 1 Gsample              |
| R&S® SMBVB-K513 ARB memory Extension to 2 Gsample              |
| R&S® SMBVB-K520 Baseband Realtime Extension                    |
| R&S® SMBVB-K523 Baseband Extension to 240 MHz RF bandwidth     |
| R&S® SMBVB-K524 Baseband Extension to 500 MHz RF bandwidth     |
| R&S® SMBVB-K540 Envelope Tracking                              |
| R&S® SMBVB-K541 AM/AM, AM/φM Predistortion                     |
| R&S® SMBVB-K544 User-Defined Frequency Response Correction     |
| R&S® SMBVB-K704 Flexible Reference Input from 1 MHz to 100 MHz |
| R&S® SMBVB-K720 AM/FM/PhiM                                     |

## New Functionality / Changed Behavior

Initial firmware version for R&S® SMBV100B

## Known-Issues

SMBVB-K540 Envelop Tracking: The differential voltage is negative, if  $V_{pp}$  greater than 1V

Baseband Digital Input (BBIN): Not supported

Multi Instrument: Not supported

Baseband: External clock not supported

In rare cases the error message "RFB6.BB: Output unlevelled: Gain Control on Upper Limit" appears in the history.

## 2 Modifications to the documentation

The current documentation is up-to-date.

## 3 Firmware update

### Required equipment

#### Software:

- Firmware update file **SMBVB\_<version-number>.rsu**

#### Hardware:

- USB memory stick with enough free space to save the update file (about 420 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®SMBV100B:

- 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  “Adjust All”. internal instrument adjustments and will take several minutes.internal instrument adjustments and will take several internal instrument adjustments and will take several minutes.internal instrument adjustments and will take several minutes.internal instrument adjustments and will take several minutes.

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

## 3.1 Alternative update procedures

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

### 3.1.1 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 **SMBVB\_<version-number>.rsu** to directory update
- The update procedure starts immediately
- Execute internal adjustments, if indicated

### 3.1.2 Firmware update using ISO image

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#### **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 **SMBVB\_<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.

Or

- 1 USB-Stick formatted with FAT32 file system
- PC with a program for creating a bootable USB-Stick e. g. UNetbootin.

##### **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 with external CD-ROM burner

### Burn ISO image onto CD

On most computers, burning an ISO image can be initiated by simply double clicking the ISO image file. If this is not the case, the manual procedure is similar to the following instructions. Nero Burning ROM (StartSmart) is used in this example.

- Connect the external USB CD/DVD drive to the PC
- Insert CD recordable
- Start Nero StartSmart
- Select medium „CD“
- Select „Create Data CD“
- From the **Files menu**, open file **SMBVB\_<version-number>.iso**
- Click "Burn"
- When finished, close Nero and disconnect external USB CD/DVD drive

### Install new firmware on R&S®SMBV100B

- Instrument must be switched off
- Connect the external USB CD/DVD drive to the R&S®SMBV100B
- 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

## Update procedure with bootable USB stick

UNetbootin is used for this example

- Format an USB stick with FAT32
- Download the unetbootin Windows application from the web <https://unetbootin.github.io/>
- Start the UNetbootin application
- Select the **SMBVB\_<version-number>.iso** and your USB stick
- Press OK. The bootable stick is prepared now
- Insert the prepared stick to the USB port on the rear side of the SMBVB
- Power on the SMBVB

- Select 'installer' in the UNetbootin menu



- The ISO is now copied to the SMBV100B
- Start the installation

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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:



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