

R&S®SMBV100B

Release Notes

Firmware Version 5.30.047.27

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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 5.30.047.27

Released: January 2024

New Functionality / Changed Behavior		
GNSS		
	Improved Inter-Signal Coherence	1231812

Fixed Issues		
General		
	Wrong name is displayed for option K363 in options management	1237549
	Selftest for DACBBV fails	1237175
GNSS		
	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
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Known Issues		
	AM Depth is not correct for modulation frequencies > 5 kHz	1019250
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
	Issue with smoothing of trajectories	466593

1.2 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		
General		
	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. R&S RF power sensors can now be used for closed loop power control of the RF output.	1042906
802.11be		
	Make bits 54 and 55 available for trigger frame - special user info field	1084762

5G New Radio		
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.
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
EUTRA/LTE		
	LTE: Support of ARB sequence Length in Subframes together with Frames.	1036955
GNSS		
	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
HWP-UWB		
	HRP-UWB:SFD settings User1/2/3 are hidden.	1051824
OFDM		
	DC sub carrier handling modes puncture and skip	1174793
	Support Cyclic Suffix (CS) for OFDM	1089708
DME		

	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
DVB-S2X-E		
	First version to support option SMBVB-K476	1209979
DVB-RCS2		
	First version to support option SMBVB-K469	1209980

Fixed Issues

	AM and FM is not working concurrently	1221349
5G New Radio		
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 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
EUTRA/LTE		
	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 PBSCH 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 deltaFToDc is wrong	1061190
GNSS		
	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 '.xtd' 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
802.11		
	Set to default does not properly set the antenna configurations	1043899
802.11.ac	Incorrect LDPC PPDU encoding process in some cases	1098220
802.11.ax	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
802.11.be	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
HWP-UWB		
	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
VOR/ILS		
	4 Letters where not supported with some character combinations	1190233
DME		
	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
NFC		
	SCPI command :NFC:CBLOCK1:DURATION shows error message	1186041
Bluetooth		
	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
OFDM		
	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

Known Issues		
	AM Depth is not correct for modulation frequencies > 5 kHz	1019250
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
	Issue with smoothing of trajectories	466593

1.3 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

1.4 Version 5.10.035.34

Released: February 2023

New Options

None

New Functionality / Changed Behavior

None

Fixed Issues

Improvements for manufacturing

1.5 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

Baseband

	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
AWGN		
	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
5G New Radio		
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
EUTRA/LTE		
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
GNSS		
	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 ≥ 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
HWP-UWB		
	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
OFDM		
	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

Fixed Issues		
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
AWGN		
	Incorrect signal when using noise only mode after starting the instrument.	973583
5G New Radio		
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
EUTRA/LTE		
	LTE: 3MHz and 5MHz PBSCCH 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
GNSS		
	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.xtd 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
GBAS		
	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
802.11		
	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
HWP-UWB		
	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
Bluetooth		
	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
DME		
	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
ARB		
	Filenames containing special characters (non ASCII), cannot be selected	1008640
DME		
	An unsuccessful search for a trigger level using the NRP-Z81 power meter, resulted in a very low trigger level that causes random trigger events	1028073

GNSS		
x	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

1.6 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
Baseband		
	Wrong or no IQ signal on rare occasions at high surrounding temperatures	937582
ARB		
	Not possible to set number of samples for AWGN test signal	907256
GNSS		

	Multi-instrument trigger not working with GNSS	960533
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1.7 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

5G New Radio		
General	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
	Downlink	Add IAB-MT reference measurement channels
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
Uplink	Add R16 OCC length and index configuration for PUCCH format 2 and 3.	774525
	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
Test Case Wizard	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
Setting Transfer	Support allocation type 0.	869280
	Support coreset Allow PDSCH mode.	878228
EUTRA/LTE		
General	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
HRP-UWB		

	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
GNSS		
	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

Baseband

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

5G New Radio

General	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
Test Case Wizard	Generally using 'Analog & Digital HS' mode on B13XT SMWs prevents using SGTs..For the next release we can call it a new feature: 5G NR: 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
Downlink	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

Uplink	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
EUTRA/LTE		
General	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
Downlink	DCI 1A mode PRACH does not work.	674649
	Problems with Release DCI while configuring and recalling SPS settings.	732688
GNSS		
	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

802.11		
	802.11ax: some HE-160 trigger based PPDU configurations crash	845722
	802.11be: Filter settings cannot be changed in 20MHz.	896821
HRP-UWB		
	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

1.8 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
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Digi I/Q

	Connection fails	831137
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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

1.9 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		
Custom Dig Mod		
	GSM Coding not supported	829914
5G New Radio		
General	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
Downlink	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
Uplink	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
EUTRA/LTE		
General	Marker delay is additionally displayed in time units.	761883
Test Case Wizard	Support for newer releases.	732520
Downlink	Generate U-Plane Data for given configuration (K175 needed).	759648
Uplink	FRCs A.21, A.22.	508595
HRP-UWB		
	"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
GNSS		
	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
802.11		
	802.11be: first feature set including the non-OFDMA mode	732639

Fixed Issues		
Common		
Error message "Output unlevelled" might occur in some situations with level sweep and Settings Characteristics = Uninterrupted		612985
Baseband		
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
5G New Radio		
General	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
Test Case Wizard	Incorrect RB offset of interfering signal of 7.4.2B in lower frequency	826900
Downlink	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

Uplink	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
EUTRA/LTE		
General	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
Downlink	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
Uplink	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
GNSS		
	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
802.11		
	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
SMBVB K153 DME		

	DME Analysis had reply delay measurement gate limited to 150us	784351
Digital IQ		
	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
HRP-UWB		
	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
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 4.80.041.61

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
Test Case Wizard	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
Downlink	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
Uplink	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
EUTRA/LTE		
General	Some LTE / IoT options have been renamed for simplification.	759109
GNSS		
	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
HRP-UWB		
	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		
Common		
	LF Generator shape "Square" does not work	637133
Baseband		
	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
5G New Radio		
	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
General	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
Test Case Wizard	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
Downlink	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 ≥ 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	
Uplink	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
EUTRA/LTE		
General	If an instrument self test is executed after recalling specific settings, error messages show up.	724048
Downlink	User interface issue for PDSCH scheduling mode "Auto Sequence".	762783
	Issue for Auto-DCI in case of special RNTIs.	723451
Uplink	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	

GNSS		
	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
OFDM Signal Generation		
	Issue when exporting the configuration for R&S signal analyzers.	729109
802.11		
	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
Avionic		
	ILS User Frequency Setting not always working	755644
SMBVB K153 DME		

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

Known-Issues		
Baseband		
	External clock is not supported	
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
	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

1.11 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
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5G New Radio

General	Configuration issue for trigger mode "single sequence".	697014
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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
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GNSS

	Constellation of Beidou geostationary satellites might deviate from the expected one if the simulation time is changed.	498094
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	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

1.12 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 “Setup” / “Maintenance” / “FPGA / uC Update” / “Install” 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
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IEEE 802.11 a/b/g/n/ax WLAN		
802.11ax	Added support for proprietary 4096 QAM modulation	654426
OFDM Signal Generation		
	Fewer redundant entries in exported xml settings	620177
5G New Radio		
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
K153		
	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
EUTRA/LTE		
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
GNSS		
	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
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	Issue with manual trigger on USER5 connector.	507994
	User Correction: Fill operation of table editor does not work	682122
Baseband		
	Wrong PEP value is shown when digital modulation and AWGN is on	700883
	SMBV100B in slave mode gets triggered permanently	651119
5G New Radio		
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 KO.	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
K548 Crest Factor Reduction		
	CFR feature not working without installed option K811	692124
SMBVB K153 DME		
	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
EUTRA/LTE		
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
BER		

	Fixed Bit Error Rate test generator (Selftest) issues.	492557
	Issue with clock state display	571351
Custom Digital Modulation		
	Effective single trigger sequence length shorter than specified value, especially for low symbol rates	539878 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
Bluetooth		
	Automatically adjust sequence length according to configured parameter sets with active dirty transmitter test	684304
BBin Interface HS DIG I/Q		
	Samplerate might be incorrectly rounded	627442
IEEE 802.11 a/b/g/n/ax WLAN		
	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
GNSS		
	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
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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 4.70.006.33

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

Common		
	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"> SMBVB-K119 LTE Release 13/14/15 SMBVB-K143 Cellular IoT Release 14 SMBVB-K419 LTE Release 13/14/15 for R&S® WinIQSIM2 SMBVB-K443 Cellular IoT Release 14 for R&S® WinIQSIM2 	583867
RF		
	Extended Mixer Mode This feature requires re-execution of the internal adjustments.	578641
IEEE 802.11 a/b/g/n WLAN		
	Data tab displays frame active duration and duty cycle (active_time / total_time)	598969
OFDM Signal Generation		
	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
5G New Radio		
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
EUTRA/LTE		
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
GNSS		
	a GNSS specific AWGN configuration is implemented in GNSS Simulation Configuration dialog	619304

Fixed Issues		
Common		
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
RF		
	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
AM Modulation		
	The modulation depth didn't change the PEP value.	510310
OFDM Signal Generation		
	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
5G New Radio		
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
EUTRA/LTE		
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
NFC		
	Signal is not recalculated after executing set to default.	572158
GNSS		
	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
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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

1.14 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		
Common		
	Added multi instrument support.	495161
RF		
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
Bluetooth		
General	Added support for Bluetooth Core Specification Madrid (BT Version 5.1).	511112
5G New Radio		
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
EUTRA/LTE		
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
GNSS		
	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		
Common		
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
RF		
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
ARB		
General	In mode Armed Auto the external global trigger delay limits are not consistent between the different units.	477362
IQ Modulator		
	<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
5G New Radio		
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
	The maximum configurable playback rate is incorrect in some cases.	450130
Downlink	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
EUTRA/LTE		
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
GNSS		

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

1.15 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
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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
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3GPP

Uplink	Discontinued EDPDCH overall symbol rate modes are still shown in the user interface.	452691
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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
EUTRA/LTE		
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
ARB		
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
IQ Modulator		
	An error message appears, if 'Adjust I/Q Modulator current frequency' is executed an no baseband signal available.	452783
External Reference Frequency		

	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
AWGN		
	Spurs appear in the signal outside the noise spectrum for some cases with higher noise system bandwidth.	477966
5G New Radio		
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
EUTRA/LTE		
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

1.16 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 Vpp 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

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

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.

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 or follow this QR code:



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