R&S®SMW200A
Release Notes

Firmware Version 5.30.047.28

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® SMW200A is abbreviated as R&S SMW200A

ROHDE&SCHWARZ

Make ideas real

Contents

1 Information on the current version and history

NOTICE

Specified frequency and level setting times for instruments equipped with an IPC10/2 Controller with firmware version 4.30.005.29 and higher are increased by typ. 0.2 ms.

NOTICE

Signatures:

As of version 4.30.005.29, only signed updates are released in order to make the instruments even more secure.

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

The instrument's behavior can also configured via "Setup>Security>Security>General>Secure Update Policy".

These settings are password protected.

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

Through a modified check of the signature, the old releases

4.00.023.20, 4.15.048.29 and 4.20.004.25

generate the following message during the update process:
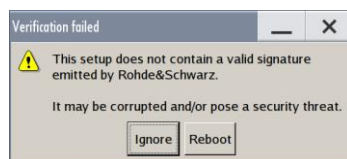
This message can be ignored, press "Ignore".

The signature of release

5.00.166.20/22/23

has a term of 2 years only.

1.1 Version 5.30.047.28

Released: February 2024

New Options
● none

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

Fixed Issues	
Settling time of frequency/level too slow with 5.30.047.20/23 on devices equipped with IPC10/2	1235084
GNSS: Generator may re-boot when simulation is running at certain week roll-over dates and Galileo F/NAV is used	1228525
GNSS: Navigation data bits are not correctly generated for BeiDou B1C for simulations running in the first seconds of a BeiDou week	1231339

1.2 Version 5.30.047.23

Released: December 2023

New Options
● none

Fixed Issues	
Empty Open Source Acknowledgment File in FW	1222144
Time based trigger not working correctly in MIMO mode	1212142
Multi instrument with 2 SMWs: no sync when SGTs are connected as external RFs to secondary SMW	1215158

1.3 Version 5.30.047.20

Released: November 2023

New Options
● SMW-K363 CAR NAVIGATION TEST SUITE
● SMW-K556 CUSTOMIZED DIGITAL INPUT

New Functionality / Changed Behavior	
SMW K502/3/4 Extended Sequencer now supports time based trigger mode	1173329

SMW-K503/4: Added File Playback Mode for SMW-K503		1089518
New feature Time Based Trigger		934883
New option SMW-K556: Customized digital high-speed input		**1185183**
802.11be: make bits 54 and 55 available for trigger frame - special user info field		**1084762**
Digital Input (DIG IQ and HS DIG IQ): Changed max. value of input signal Crest Factor (40 dB).		1105233
OFDM: DC sub carrier handling modes puncture and skip.		**1174793**
OFDM: Support Cyclic Suffix (CS) for OFDM.		**1089708**
5G New Radio		
	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
Downlink	-	
Uplink	Apply HARQ feedback only at the leading slot of a set of slots transmitting the same transport block (TBOMS)	1171952
	Configurable offsets between slots for TBOMS	1095605
TCW	New test cases 8.2.12, 8.2.13, 8.3.11, 8.3.12, 8.3.13 are added.	1069108
	Power limits are able to select from 38.141 or 38.104.	1037405
	Record the Scpi commands for current test case.	956546
	Show what options are missing for test cases.	956560
	Support BS Type 2-O for test case 8.2.5.	1060181
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	1086736

	messages, but only in mode "Navigation" when "Nav Msg Control" is set to "Auto". In all other cases, the frequency number is editable now	
FADING		
	Extend Basic Delay per Group to 1073 ms (only SMW-B15)	1174929
WLAN-11ay		
	Output sample rate will be adjusted according to the selected instrument hardware	1178046

Fixed Issues	
3GPP FDD: Path C and D do not work on devices with SMW-B9/B15 options.	1097029
Analog IQ outputs: long setting times when using bias > 0V	1182262
Error message reference PLL unlocked shown when using Primary Secondary mode	1085398
FM deviation incorrect in certain cases	1185723
Frequency >= 10GHz can now be set in the main screen with the precision of 0.001 Hz	1203039
Invalid PEP warning related to RF ports alignment (K545) has been removed.	1067487
K544 state toggling has no effect if the Driver Amplifier is activated and the RF frequency is above 44 GHz.	1099579
K555: Resolved some minor bugs during setup calibration	1196442
NB-IoT: Error message for large start subframes if the Real Time feedback is activated.	1064267
NFC: Fix for Preset This Parameter, which cannot preset the parameter to default in NFC/EMV sequence tab	1196135
NFC: fix for SCPI Command availability for the parameters in GUI Table in EMV dialog	1186036
selection of LowDistortion and LowNoise greyed out and not selectable with ATT70	1180261
Unexpected line feeds in Python SCPI recording	1169964
Warning occurs occasionally after initially activating Port Alignment.	1201735
K544 state toggling has no effect if the Driver Amplifier is activated and the RF frequency is above 44 GHz.	1099579

5G New Radio		
General	dmrs port 1000 showed wrong data for dmrs values	1176845
	For sample rates close to the boards maximum CA rate (high advanced MIMO configs) the real-time signal is not output correctly	1075711
	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
	Turning feedback ON sets the parameter Restart Data and Control to the correct setting After Each Codeword and Allocation, yet it is unexpectedly still possible to select a different setting for that parameter.	1093894
	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

Test Case Wizard	Adjust the number of required K71 option to 2 for TC 824 and 825	1193451
	Prach test preambles issue for test case 8.4.1	1203045
Downlink	Crash while increasing the CSI-RS rows.	1100831
Uplink	SRS start index calculation incorrect	1104132

EUTRA/LTE

	Uplink: In case of K69 realtime feedback and NB-IoT / eMTC, error messages can show up regarding failed leveling.	769389
	Wrong subframe index issue.	1094264
	TCW: Correct start subframe of NPUSCH transmissions for test case 8.5.1	1096511

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

Fading

	Synchronize start of simulation (or stochastically process) between both Fader in 2xSISO	1105203
	Some parameter values in the 802.11ac Model F preset are wrong	1199832
Radar		
	Fixed reset behavior when arming the trigger. Signal statistics where not reset correctly	1195240
	Radar Echo Generation (REG): Update Level for Simulation if external Frontend is connected.	1108492
802.11		
802.11.ac	Bugfix for crash because of clearing buffers that are not actually allocated when in MIMO mode	1086348
	Incorrect LDPC PPDU encoding process in some cases.	1098220
802.11ax	802.11ax/be: incorrect power factor for multiple MIMO streams.	1084706
	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	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
AWGN		
	AWGN block state does not switch on the right streams when Duplicate Streams are active (System Config mode Advanced 3x1x1 or 4x1x1)	1108654
	Show SCPI Command... is not working well when called from context menu of AWGN Block (in Block Diagram)	1082824
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
WLAN 11 ay		
	8psk Long LDPC encoder error	1163671
	Typo Error for Bandwidth	1107291
OFDM		
	Missing warning if configuration is out of specification.	1047939
	Split Pattern not transmitted in Settings Transfer	1183157
	Waveform generation sometimes fails with DataInit error, with only switching state to off and on again solving the problem.	1185661

Known Issues	
ARB: filenames containig special characters (non ASCII), cannot be selected	1008640
baseband selftest sometimes shows errors concerning DSP	902551
Fading: Sporadic error message when switching between some fading configurations. The simulated signal is not affected.	818966
Focus in Security-dialogue can not be set after display-only mode. Focus can be set again with a mouse click.	1065289
K548 Crest Factor Reduction: Output crest factor for some 5GNR carrier aggregation signals offset by up to 1 dB with respect to the desired value.	832180
Fading: Signal of Baseband D is not generated after recalling a saverecall file of a 4x2x2 coupled per entity system config	929582
SMW-K504: 2 MPDW PDW rate is unstable over long periods when simultaneously streaming	1190559
Table editing: Confusing behavior of TAB key on external keyboard	1013570
Radar: Time dependencies in syncronized multi generator setups where incorrect in Extended Sequencer Mode.	620379
Time Based Trigger: Not working when trigger settings common to all basebands	1212142
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

1.4 Version 5.20.043.44

Released: June 2023

New Options
● SMW-K177 IEEE 802.11AY
● SMW-K477 IEEE 802.11AY (WINIQSIM2)

New Functionality / Changed Behavior	
RF Measurement: Added new feature Power Control. R&S RF power sensors can now be used for closed loop power control of the RF output.	1042906
RF Measurement: Dialogs have been rearranged in order to clarify dependencies and to integrate Power Control.	1072459
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
K555 Bandwidth Extension:.- Power was 3dB lower than expected after setup alignment.- If digital attenuation was active before setup alignment, the aligned power was not correct.- Waveforms which are not a multiple of 60 were distorted during playback.- Multi instrument support.- FSV(A) support	1011839
Crest Factor Reduction: New algorithm Peak Cancellation added	**922341**
Custom Digital Modulation: added SOQPSK-TG modulation format	**763987**
Radar Echo Generation (REG): "Hold Off Time": Sets a time delay for the appearance of each object.	1050670

5G New Radio		
General	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
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
Uplink	SRS Rel.17 support.	1007385
	Transport Block Over Multi Slots	979048

EUTRA/LTE

General	LTE: Support of ARB sequence Length in Subframes together with Frames.	1036955

GNSS

	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

FADING

	Add R17 NTN Channel Presets	1047940
	New 5GNR Channel Model Scenario Y for 120 kHz SCS	1031660
	SMW-B15: Base Delay (536 ms) available for path group 2,3,4	927551

WLAN-11ay

	First version to support options K177/K477.	1034856
	Support for BW 2.16GHz.	1016241
	Support for BW 4.32GHz.	1016242
	Support of EDMG SC mode.	986091

Fixed Issues	
ARB: multiplier keys are not accepted for Single Trigger Sequence Length	994625
Common Trigger Source is not correctly displayed in 1-path instruments when they are set in mode Multi-Instrument Secondary.	1079924
Multi Instrument Common Trigger dependencies are not always done in SMW instruments that use ADV CLK / TRG connectors for signal synchonization	1073960
System Configuration (Fading/Baseband Config) Set to Default button was removed.	1042357
The invalid information messages, which appears after restarting the device with enabled RF ports alignment (K545) has been removed.	1067705
Digital standard Extended Sequencer: T/M/C local connectors not usable	1028170
Impulsive Noise: unable to activate impulsive noise when general AWGN mode is set to CW interferer	1055603
Internal adjustments not completing to 100% when other instruments are connected to HS DigIQ inputs or outputs.	1029271
Listmode in path B with IQ modulation couldn't work. Condition improved.	1037438
Preset behavior: Keep connections to external instruments' is not working well with external instruments connected to Analog I/Q Outputs	1038057
K544: filter calculation issues with certain frequency responses	991199
K544: Firmware crashes if empty *.ucor file is chosen	1048028
Oneweb Uplink: Delta Sequence shift value for PUSCH is fixed	1046255
OFDM: Timeplan does not scale correctly	1002976
Invalid PEP warning related to RF ports alignment (K545) has been removed.	1067487

5G New Radio		
	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
	For sample rates close to the boards maximum CA rate (high advanced MIMO configs) the real-time signal is not output correctly	1075711
	Quick Setting: Slot Period 1 cause an error.	1051697
	Settings transfer broken in beta 22.09.	1019190
General	Interval of Datasource reset is calculated wrong in case of scs higher 120 kHz	1061535
	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
	Correct Interferer RF Frequency Calculation for TC 7.7 RX Intermodulation Narrowband.	1037716
Downlink	Minimal Value of the PDSCH BWP Setting Multi Time Domain Allocations is wrong	1044641
	SS/PBCH can be wider than carrier carrier channel bandwidth.	1067434
Uplink	SRS 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		
General	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
	For 8x1x1 Configuration Sampling rate is fixed.	688386
	3MHz and 5MHz PBSCH mapping for DMRS is fixed for sidelink.	1015750
	Calculation of the NID1 is fixed.	1014576
	LTE-K69:Fix for wrong message about missing connector configuration	764516
	NB-IoT: TM mode N-TM_Guardband is not correct leads to deltaFToDc is wrong.	1061190

GNSS		
	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
	Wrong value is set by clicking the Reset button in on-screen keyboard, when editing Date or Time parameters	1022564
	GPS almanacs are not provided with Novatel receivers when a GPS satellite is not present in the constellation	1028805

Fading		
	Enhance maximum Base Delay SMW-B14: 671 ms + SMW-B15: 536 ms	1060469
	FaderDrv Error 22 when switch ist LogNormal State = ON to configuration Birth Death Propagation or High Speed Train	1046809
	SOUR1:FSIM:DEL:GRO1:PATH1:BDEL? res and SOUR1:FSIM:DEL:GRO1:PATH1:ADEL? res return wrong value in some cases	1010718

Radar		
	K315: Deactivated trigger delay param from sequencers in RTCI mode	1026682
	K502/3/4/6: Extended Sequencer mode is now shown in block diagram	1032261
	SMW-K502/3/4: Marker delay setting did not work	1007257
	Radar Echo Generation (REG): error messages can occur with signal routing and awgn	1030202
	K503/4: Added frequency index CNTRL PDW for fast frequency jump mode	1020210

802.11		
802.11	Set to default does not properly set the antenna configurations	1043899
802.11ax	Incorrectly calculated number of A-MPDU padding bytes with some HE-TRIG configurations.	1080436
802.11be	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-LTF for 2x2 MIMO	1035970
	incorrect EHT-LTF power for higher MIMO streams.	1034852
	incorrect EHT-STF normalization for 2nd 484 tone RU.	1076573
	incorrect encoding for some MU-MIMO cases.	1042825
	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

HWP-UWB		
	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

DVB		
DVB-RCS2	Crash in case of setting BTU bandwidth to 10Hz.	1071573
	Bug fix for pi/2 BPSK.	1066802
	Bug fix for Pi/2-BPSk Modulation	1062751
	Bug Fix for 16QAM 5/6 code rate	1055606
	Bug fix for preset values.	1084261
DVB-S2X	The parameters of general tab are invisible in case of K52 is not installed.	1033661
AWGN		
	'Noise Power (System Bandwidth)' throws parameter is read only error when 'Show Powers for Output' is I/Q Out or BBMM	1047015
	Noise Power and Carrier Power do not work with an external Frontend connected	1040431
	intermittently missing noise signal on narrowband SMWs in 8-channel MIMO configurations.	1053484
	spectrum deviation of AWGN in 8-channel system configurations	512284

Known Issues		
3GPP FDD: Path C and D do not work on devices with SMW-B9/B15 options.		1097029
ARB: filenames containig special characters (non ASCII), cannot be selected		1008640
baseband selftest sometimes shows errors concerning DSP		902551
Fading: Sporadic error message when switching between some fading configurations. The simulated signal is not affected.		818966
K545 embedding bug solved.		1099362
K548 Crest Factor Reduction: Output crest factor for some 5GNR carrier aggregation signals offset by up to 1 dB with respect to the desired value.		832180
Signal of Baseband D is not generated after recalling a saverecall file of a 4x2x2 coupled per entity system config		929582
System Time locks via SCPI if using External Trigger, keeps running in the GUI		962298
Table editing: Confusing behavior of TAB key on external keyboard		1013570
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

1.5 Version 5.10.035.38

Released: April 2023

New Options
● SMW-B1044O 100 kHz to 44 GHz RF path A, Pulse and BW lim. in 31.8-37 GHz
● SMW-B1056O 100 kHz to 56 GHz RF path A, Pulse and BW lim. in 31.8-37 GHz
● SMW-B2044O 100 kHz to 44 GHz RF path B, Pulse and BW lim. in 31.8-37 GHz
● SMW-B1067O 100 kHz to 67 GHz RF path A, Pulse and BW lim. in 31.8-37 GHz

Fixed Issues	
AWGN: intermittently missing noise signal on narrowband SMWs in 8-channel MIMO configurations.	1053484
K544: filter calculation issues with certain frequency responses	991199
802.11be: firmware crash with EHT-MU, 320MHz and 144 configured users	1030872
AWGN Noise Power and Carrier Power do not work with an external Frontend connected	1040431
AWGN 'Noise Power (System Bandwidth)' throws "parameter is read only" error when 'Show Powers for Output' is I/Q Out or BBMM	1047015
GNSS: wrong value for NAVIC Signal Dynamics Velocity when set via SCPI in GNPR context	1062079
'Preset behavior: Keep connections to external instruments' is not working well with external instruments connected to Analog I/Q Outputs	1038057

1.6   Version 5.10.035.29

Released: December 2022

* -

Fixed Issues	
Internal adjustments not completing to 100% when other instruments are connected to HS DigIQ inputs or outputs.	1029271
Internal adjustments fail for B1031/B2031	926986
Digital standard Extended Sequencer: T/M/C local connectors not usable	1028170
Issue if Optimize EVM and phase offset are both activated	1028957

1.7 Version 5.10.035.25

Released: November 2022

New Options
●   SMW-K122 RTK VIRTUAL REF.STATION
●   SMW-K128 P(Y)-/M-/PRS-NOISE

New Functionality / Changed Behavior	
802.11be: support signalling of 320MHz channelization in U-SIG	1019456
Add additional 3GPP2020 scenarios including QZSS and NAVIC (based on draft standard)	978942
Added pre and post marker settings for Pulse Sequencer und Direction Finding Mode of the Extended Sequencer. Previously only available for SMW-K503 Extended Sequencer RTCI Mode	1009050
Delivery of RTK corrections in RTCM 3 format via integrated Ntrip server supported	925261
Generate Waveform: Add Markers to exported waveform file	992643
K555: Added support for external frontends, added support for 4 GHz bandwidth over multiple SMW devices.	954484
K555: One-box solution available	891171
SMW-REG: Objects 4, 5, 6 and 10, 11, 12: No user list possible + maximum doppler shift: 190 kHz	1012936

5G New Radio		
	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
General	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
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
Uplink	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
EUTRA/LTE		
General	LTE Sidelink: 64QAM support added.	944854
	Optional baseband frequency sweep for NB-IoT and eMTC.	784608
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
HWP-UWB		
	STS Data can be configured Bitwise.	977043
DVB		

DVB-S2X-E	TSN is able to be set flexible for PL Frame of DVB-S2 / S2X.	956310
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	
Error message thrown under some conditions using frontend levels >0dBm	972842
OneWeb: Single trigger mode is fixed.	993161
3GPP:Updating of Symbol rate for user coding.	1021027
Frequency response for SMW200A B1044N, B2044N, B1056N and B1067N and SMM100A B1044N devices got improved for frequencies of 20 GHz and above.	1017243
Global Connectors: Incorrect settings applied in some cases when RF is switched on	1021540
K315: Mixed addressing mode (DHCP and Static) in case of multiple sequencers not correctly displayed	960848
K555: Output power sometimes not correct for uneven distribution in the spectrum of the signal. In rare cases, the error RFOPU on upper limit could appear	1011295
SMW-K555: Baseband error - Fader during initial execution of Align RF Ports	1013616
OFDM: Time plan can show symbol #0 twice.	981990
On specific device configurations (without option SMW-K76), the firmware crashes on preset when starting with a MIMO case	921445
On specific device configurations (without option SMW-K76), the firmware crashes on preset when starting with a MIMO case.	1001271
Phase Noise: the User Profile might be wrong in some cases, when the values are set via SCPI while the AWGN dialog is not opened	1011593
Remote Emulation: *IDN* and *OPT? strings can not be entered via touch screen. External keyboard or mouse required	657096
The GUI is no longer accessible after Save As... is called in some File editors	1005052
Unexpected options are used in special cases after loading a savefile.	1015972
+/- Hardkey on Numblock does not toggle / change the sign of a numeric value.	957951

5G New Radio		
	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
General	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

	5GNR: 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)	971307
	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
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
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
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
EUTRA/LTE		
General	LTE: 3MHz and 5MHz PBSCH mapping for DMRS is fixed for sidelink.	1015750
	EUtra: ORAN State was not stored.	979836
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 smoothening 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
Fading		
	DSP Error 0x9000 with HST and 1x8 (only SMW-B15)	974843
	Error message FADER_ERROR_TYPE = 145 for MIMO 4x4 after MIMO 8x8, Subset 1/2 was set	1002004
	Moving propagation scenarios using several paths may fail in in MIMO configurations on wideband devices	895402
	On narrowband devices and for moving propagation scenarios, a 0x8004 error could be thrown if the stream mapper does not map some RF outputs to any stream.	919681
	B15: Reduce processing time after change system configuration mode Standard to Advanced	1011262

	For 5...8x1x1 with SMW-B14: wrong max value for Additional Delay: SOUR{1}:FSIM:DEL:GRO{1}:PATH{1}:ADEL? max and Base Delay: SOUR{1}:FSIM:DEL:GRO{1}:PATH{1}:BDEL?	1010808
	only B15: CDF - interval length (Interval[us]) too short by factor 0.8.	993266
	SMW-B15: Delay calculation faulty for some delays, e.g. path0: 60ns, path3: 124 ns	999937
Radar		
	SMW-REG: Objects 4, 5, 6 and 10, 11, 12: Range (due to wrong latency calibration) might be not accurate	1013114
	SMW-K78: Remove DSP Error 0x8004, 0x8016, improved System Latency Calibration = Automatic	828327
	SMW-K78: System Latency Calibration = Auto might result in wrong System Latency.	989793
	SMW-K78: User List, phase entry is random in some cases until the first timestamp > 0 ms.	977764
	SMW-K78: With Armed Auto: NCO start phase might be random after first trigger execute.	1010184
	SMW-K78: With Moving + Round Trip: User list is truncated after Time to reach end range is reached. Now full list is played until object returns to start range.	1014081
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
HWP-UWB		
	Display of Mean PRF value is fixed in HPRF mode.	958974
	Fix for Data Length.	952104
	Fix for Databse 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
DVB		
	DVB-RCS2: Fix for Data List.	992169
	DVB-RCS2: The default filter is not correct for DVB-RCS2.	970409
	DVB-S2X-E:Different SF lengths are fixed.	972444

Known Issues	
ARB: filenames containig special characters (non ASCII), cannot be selected	1008640
baseband selftest sometimes shows errors concerning DSP	902551
Fading: Sporadic error message when switching between some fading configurations. The simulated signal is not affected.	818966
K544: filter calculation issues with certain frequency responses	991199
K548 Crest Factor Reduction: Output crest factor for some 5GNR carrier aggregation signals offset by up to 1 dB with respect to the desired value.	832180
Signal of Baseband D is not generated after recalling a saverecall file of a 4x2x2 coupled per entity system config	929582
S-Parameter not used in Fill User Correction Data With Sensor	1021049
System Time locks via SCPI if using External Trigger, keeps running in the GUI	962298

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

1.8   Version 5.00.166.23

Released: August 2022

New Options
● -

New Functionality / Changed Behavior	
802.11be: add support for punctured RUs in OFDMA mode.	942903
802.11be: added non-OFDMA DL MU-MIMO	911554

Fixed Issues	
On specific device configurations (without option SMW-K76), the firmware crashes on preset when starting with a MIMO case	921445
Internal adjustment: BUSY led was shown late	969479
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

1.9   Version 5.00.166.22

Released: June 2022

New Options		
●	SMW-K555	Bandwidth Extension

New Functionality / Changed Behavior	
802.11: New parameter Frame Delay supporting waveform time shift.	954461

Fixed Issues	
Custom Digital Modulation: firmware crash in some cases when using binary control lists	964263
SMW: Firmware crashes after changing the global connectors many times	962208

1.10   Version 5.00.166.20

Released: May 2022

New Options	
● SMW-K111	GBAS
● SMW-K123	MODERNIZED GLONASS
● SMW-K423	MOD. GLONASS (WINIQSIM2)
● SMW-K169	DVB-RCS2
● SMW-K469	DVB-RCS2, WINIQSIM2
● SMW-K170	5G-NR SIDELINK
● SMW-K470	5G-NR SIDELINK, WINIQSIM2
● SMW-K171	5G NR RELEASE 17
● SMW-K471	5G NR RELEASE 17, WINIQSIM2
● SMW-K176	DVB-S2X-E
● SMW-K476	DVB-S2X-E, WINIQSIM2
● SMW-K506	AGILE SEQUENCING
● SMW-K507	ARB ETHERNET UPLOAD

New Functionality / Changed Behavior		
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
First version to support options K176/K476		837929
First version to support options K169/K469		851370
OFDM: Implement allocation based transform precoding.		365538
Option SMW-B1067 (67GHz) supported		545657
Option T0 expanded with options K22, K23, K24, K542, K548, K703, K704, K720 and K739		880492
5G New Radio		
General	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	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
	Rel-17 feature, new Test Models for 35&45 MHz	918873
Uplink	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	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	937390
	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		
	Add new 3GPP 2020 scenarios based on 3GPP TS 37.571-5 V16.6.0 (2021-09).	912353
	Increase max Attenuation for Body Mask/Antenna Pattern (values ≥40.0 are handled as obscured)	904669
	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

	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
	GNSS supports QZSS L1C	818441
Fading		
	Changed name MIMO subsets (R&S®SMW-K821 option) + remove dependency on SMW-K75	936811
	Fixed error in SISO when loading some fading standards: 300,Device specific error / (A)General database error, (IdPDbFadStandard,h:0,c:0,s:0,d:0,g:0,u:0) and 222,Data out of range / (E)Parameter instance out of range, (IdPDbFadStandard,h:4,c:0,s:0,d:0,g:0,u:0) / Moving Propagation ALL: fixed Path Graph (delay), fixed Path Table (profile Pure Doppler, Frequency Ratio and Actual Doppler Shift) / Birth Death, changed min/max parameter setting range for Start Offset and Hopping Dwell / Two Channel Interferer: fixed Path Table (profile Pure Doppler, Frequency Ratio)	903494
	Function to import files with naming convention *customer*.fad_udyn at SMW-K820 path table. Supported format: Interval[us] Delay[ms] Fd[kHz] Pathloss[dB]. Further details, see data sheet.	938646
	High Speed Train - introduce Start Offset to shift profile in time	920939
	New MIMO 4x4, Subset 1+2 with 400 MHz BBBW (only B15)	821973
	New System Config with SMW-B15, -K74, -K821, -K822: MIMO 4x4, Subset 1+2 (BBBW = 400 MHz)	905690
	SMW-B14 Path Table supports upto 40 paths (in Configuration: Standard / Fine Delay) for system config 2x1x1 and 1x1x2 (with 2x B10 + >= 2x B14), 2x1x2 (with 2x B10 + 4x B14)	913442
HWP-UWB		
	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
DVB		
DVB-S2X-E	Support for Super Frame Formats 4,5,6 and 7.	852844
	Support ModCod Adjustment.	857266
	Support for Beam Hopping Configuration.	864082
	Support for Beam Hopping Time Plan.	869730
	Support for PN-Sequence with known Initialization Value.	877756
	SOSF Marker Support for Superframes.	893782
	Support for new Roll off values.	918704
DVB-RCS2	Support for Super Frame Configuration	900736
	Support for BTU Configuration.	900737
	Support for Grid Configuration.	900738

	Support for Slot / Section Configuration	900739
	BPSK, QPSK,8PSK and 16QAM modulations are supported.	904023
	Support for Multicarrier.	905048
	Support for Spread Spectrum Linear Modulation Burst.	916241
	Support for DVB-RCS2 Time plan.	920262
	Support for User defined mode of Linear Modulation burst.	920478

Fixed Issues	
ARB: Marker output of previously loaded waveform not disabled, when a new waveform without markers is selected.	943369
Bluetooth: Measured guard time only ~4.5us for EDR packets on SMW and SMBVB internal generators	919953
Bluetooth: Signal peaks during guard time for some EDR packets	933761
I/Q Analog outputs: voltage not returing to zero when output is switched off and bias > 0V is set	933178
K503/4: Added Default Gateway configuration for RTCI in static IP mode	921573
K503/4: Fixed PDW statistics display for Baseband B.	919433
OFDM: Trigger Mode Sigle, Signal Duration Unit - Sequence Length (SL) behaves like Signal Duration Unit - Sample.	955271
OFDM: User data sources are restarted after each allocation.	947995
OFDM: User state OFF has no implemented behavior. Switching to OFF can result in error messages or undefined behavior. The issue is fixed by removing the feature.	955245
option K553: problems with devices having 2 RFs and one option K553 (RF_B doesn't work with frontend)	948389
Pattern length could not be set using commands like.:SOURce1:BB:NR5G:SCHed:CELL0:SUBF0:USER0:BWPart0:ALLoc0:CS:DCI0:BITLength	884770
OFDM: Trigger Mode Sigle, Signal Duration Unit - Sequence Length (SL) behaves like Signal Duration Unit - Sample.	955271
SCPI: *ESR? and *STB? can not be accessed asynchronously during sensor nulling	843068
SMW-B10: On narrowband devices, when using stream addition in the stream mapper, where AWGN with C/N value is << 0 dB is applied to at least one of the added streams, relative levels between baseband streams can be incorrect.	922600
SMW-B10: When adding streams in the stream mapper, output power can be incorrect when also applying AWGN and one of the basebands at the adder input is switched off.	921626
SMW-B15: Enable Restart Mode Baseband Trigger for 2x1x1	953462
SMW-B9: 1xB9 and 0x/1xB15 and 0x/1xK62 in Mode ADV, Signal Outputs ALL: BBin State is always OFF	940708
SMW-B9: ARB signal timing incorrect in some cases, when synchronizing 2 channels and using a binary control list in one channel but not in the other.	913220
SMW-B9: Mode Advanced, Digital Only (HS): error while mapping connector BBMM2/7 to any stream.	708241
SMW-K78: DSP Error 0x8004 with moving object and changes in stream mapper. Firmware crashes with moving object, big range difference and some certain velocities.	949021
SMW-K78: DSP Error 0x8005 with moving object + cyclic	512682
SMW-K78: Error message in REG B when using Armed Auto and clicking onto Arm.	949756
DVB: Fix for High Roll off values.	927405
5G New Radio	
General	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	920211
	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.	953321
	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	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	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
	PUCCH Format3 and Format4 polar coding might be wrong for some configurations (e.g. some payload sizes)	940867
EUTRA/LTE		
General	Oran-Models are not correctly shown on path B, TDD/FDD is not considered correctly	911352
GNSS		
	Baseband errors and disappearing SVs in HIL mode in combination with high velocities.	885757
	Change default broadcast URA value for GPS satellites from 5 to 0	556689
	Decimal point for satellite orbit parameter Eccentricity cannot be changed correctly from GUI	935886
	Glonass satellites rising only after a leap second event happened in a running simulation may not be usable	906604
	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
	Inconsistent naming of power/phase in GUI of antenna pattern / body mask	931114
	Incorrect constellation for GLONASS satellites after leap second event	906399
	Some Glonass satellites under certain conditions not usable within receiver PVT solution when simulation runs continuously for more than 12h	672947
	Typo in minimum value of System Latency (2ms instead of 20ms)	954515
	The body mask and antenna pattern editors assume a flipped direction of the z-axis	429406
	Velocity (Pseudorange Rate) in tracking mode does lead to an RF signal with opposite Doppler sign.	944404
Fading		

	If a spatial channel model preset is loaded and subsequently the antenna pattern is manually overwritten, changing the IQ stream mapping might unexpectedly set the changed antenna pattern back to default.	943327
	In advanced MIMO configurations and after recalling a fader state using a *.fad file, the GUI might not show the fading state correctly.	772421
	In moving propagation mode with moving channels set to ALL, if Keep Constant in the Table Setting is set to Res. Doppler Shift it is not possible to change the doppler shift.	869585
	Loading a saverecall file in MIMO configurations with the fader 'keep constant' set to 'Res. Doppler Shift' and afterwards changing the frequency might result in a wrong update of the speed and the doppler shift in the path table (for Standard/Fine Delay and Moving Propagation ALL)..Changed default behavior of parameter 'Signal Dedicated to'. Now always 'Auto Detect Output' is chosen.	924898
	Problem with setting configuration for High Speed Train (HSTR) or Moving Propagation (MDEL) fading standard in multi-entity MIMOs	954093
	When the fader table settings set the resulting doppler shift to be constant, it is still possible to change the speed through SCPI, and consequently the doppler shift changes too.	924946
Radar		
	Inter-board synchronization did not consider ARB sample rate and number of B15 boards. This could cause time skews between sequencers.	958334
802.11		
	802.11ac: Frame type Trigger not working correctly.	945603
	802.11ax: Possible firmware crash when activating time domain windowing	911014
	802.11be: added max PE duration of 20us	911570
	802.11be: added non-OFDMA DL MU-MIMO	911554
HWP-UWB		
	Channel Number is added instead of Channel Num.	912942
	Fixes for Pattern in Datasources.	887252

Known Issues	
+/- Hardkey on Numblock does not toggle / change the sign of a numeric value.	957951
baseband selftest sometimes shows errors concerning DSP	902551
Fading: Sporadic error message when switching between some fading configurations. The simulated signal is not affected.	818966
K548 Crest Factor Reduction: Output crest factor for some 5GNR carrier aggregation signals offset by up to 1 dB with respect to the desired value.	832180
Remote Emulation: *IDN* and *OPT? strings can not be entered via touch screen. External keyboard or mouse required	657096
Signal of Baseband D is not generated after recalling a saverecall file of a 4x2x2 coupled per entity system config	929582
SMW-K78: REG recall (tab: Radar Setup) might not work in some cases (no recall executed)	954039
SMW-K506: ADW Buffer overflow is not yet raised as an error	945870

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
	Possible Ionospheric simulations mismatch	762298
	Channel allocation does not work for all signal type combinations (B10 only)	924777

1.11 Version 5.00.044.40

Released: March 2022

New Options	
● -	

New Functionality / Changed Behavior	
Internal improvement / Support of new Controller	
SMW-K553 - Allow up to two simultaneous LAN connections to one external frontend. Please note: Incompatible firmware versions installed on analyzer and the external frontend will lead to a deactivated connection to the external frontend. Please update the external frontend firmware in this case. FE50DTR Simultaneous Mode requires FSV Version ≥ V1.70	
Support for new revision of External Frontend synthesizer boards, revision ≥ 3.11	

Known Issues	
See 5.00.044.34	

1.12 Version 5.00.044.38

Released: January 2022

New Options	
● SMW-B1056 100 kHz - 56 GHz, PATH A	
● SMW-B1056N 100 kHz - 56 GHz, PATH A, LIM. BW	
● SMW-B1067 100 kHz - 67 GHz, PATH A	
● SMW-B1067N 100 kHz - 67 GHz, PATH A, LIM. BW	

Known Issues	
See 5.00.044.34	

1.13 Version 5.00.044.34

Released: December 2021

New Options	
● SMW-K307 EMITTER INTERLEAVING EXT	

New Functionality / Changed Behavior	
The option SMW-T0 includes now SMW-K300, SMW-K301, SMW-302, SMW-304, SMW-306, SMW-307, SMW-309, SMW-K502.	880467
New functionality for external frontends: Network settings	869351
ARB: New display parameter Processing Time shows the time required from an external trigger event to output of the first waveform sample	894193
SMW-K980 HUMS: Utilization improved	796595
DVB: New feature of DVB-S2 & S2x for BER test.	877754
Fading: 3GPP CDL models update according to TS 38.151 (FR1 CDL-C UMi 2x2, FR1 CDL-C UMa 4x4)	890365
Fading: New 5GNR Channel Models (TDLC300-600, TDLC300-1200, Moving Propagation Scenario X and Z)	861563
Optimize the initial EVM performance via single button click	866496

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	864231
	Additional SSPBCH Occasions.	774527
	Closed-loop HARQ K145 now also for PDSCH	800423
	Extend PBCH scrambling and payload generation for access to unlicensed spectrum.	774511
	Implement transport block scaling factor S.	863922
	K148: Increase number of configurable DCIs to 32.	866826
	New SSB periodicities for IAB	819201
	RMCs for FR2 according to 38.521-2	864358
	Type 1 Single Panel Codebook Precoding	724742
	Some release 16 updates to DCI type 2_0.	832345

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
	Support Multiplexing of R16 Configured Grand - Uplink Control Information to PUSCH.	774515
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
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

Radar		
	Added K307 16 additional Emitters for interleaving	822244
	SMWK502 Added Stats for K502	869778
HWP-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

Fixed Issues	
ARB: In sporadic cases the beginning of the waveform output is blanked	890929
AWGN: changing the C/N parameter results in a time-shift of the signal with respect to an external trigger in some cases	776616
Bluetooth: Allow test packets with 0 bytes payload length for all packet formats.	878035
Fading: 5G FR1 CDL models: The might TX antenna patterns might be wrong for some carrier frequencies	890074
Fading: In moving propagation mode, the GUI erroneously allows setting too large delay related parameter values, causing error messages to pop up during run time.	900938
For some instrument configurations, fading cannot be activated after switching to advanced system config without manually reconfiguring the Baseband BW.	840062
For Swerling 1-4 Mean, Peak and TestCoverage are not recalled correctly	899675
I/Q Analog Output with mode=variable in path B not possible due to option missing	895884
Occasional level overshoots while deactivating FM.	889891
OneWeb User-Defined Signal Generation: Uplink: Issues on 8PSK PUSCH.	832153
Permanent options that are also activated with the trial are displayed with the trial's expiry date.	870611
Pulse Modulation: SOUR1:PULM:MODE ESIN leads to error message	854797
SISO 2x1x1 with bandwidth 400/500MHz sometimes not working with path B	876490
SMW-B13XT: Unwanted signal spike when switching on the I/Q Analog output	880220
SMW-B15, 0xK822, 0xK823: In some cases SISO signals with BBBW 400 MHz or 800 MHz are blocked.	829941
SMW-B9: Allow 200MHz AWGN bandwidth in all higher MIMO advanced system configuration modes.	851830
SMW-B9: Baseband marker output on user 1-6 connectors sometimes incorrect, depending on stream mapper and RF / IQ output states.	897244
Sometimes error messages hardware missing ... after starting device without available option SMW-K19	872973
The Generate Waveform function of baseband standards fails to create a waveform file when parameters are changed before the waveform calculation has finished.	880043
Fixed since 4.90.049.47SP1 already:	
Bluetooth: Allow test packets with 0 bytes payload length for all packets formats	878035
Sometimes error messages "hardware missing ..." after starting device without available option SMW-K19	872973
B13XT: Unwanted signal spike when switching on the I/Q Analog output	880220
Unwanted signal blank during change of digital attenuation value	882124
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 only1 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: 5GNR: Test Case Wizard: Support for mode 'Analog & Digital HS' in the test case wizard (B13XT SMWs only).	837601
	SNR is not correct for 38.141-1:TC73 Dynamic Range and 38.141-2:TC74 OTA Dynamic Range.	846999
	Incorrect RB offset of interfering signal of 7.4.2B in lower frequency	826900
	Interfering RB Center Frequency of TC 742B is not updated when SCS of WS changed.	895624
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

	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
Uplink	PUSCH Interlace: 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		
	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
General	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
	DCI 1A mode PRACH does not work.	674649
Downlink	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
	No positioning solution for GPS L1/L5 when simulations start at dedicated points in time	855609
Radar		
	SCPI: improved *opc? handling while changing between ExecuteTrigger and RearmTrigger in all digital standards	875235
	K503: Now supports ignore PDW Flag	829067
802.11		
	802.11ax: some HE-160 trigger based PPDU configurations crash	845722
	802.11be: Filter settings cannot be changed in 20MHz.	896821
HWP-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	
baseband selftest sometimes shows errors concerning DSP	902551
BER: bit error rate is not displayed in engineering notation	901503
DIGIQ_SYSCONF: 4x8, 8x4, 2x4x4: DIG I/Q outputs at FADx to SGT might have signal interrupts or higher EVM	832175
Digital IQ: Enabling Markers 1 and 2 from Digital IQ HS input	845552
Digital IQ: Unstable HS digital IQ connection between devices.	804492
In higher MIMO modes, when using AWGN on I/Q Digital Outputs, the signal is missing after restarting or triggering the baseband.	697825
K548 Crest Factor Reduction: Output crest factor for some 5GNR carrier aggregation signals offset by up to 1 dB with respect to the desired value.	832180
Pulse generator external gated mode: Pulse delay applies delay to both pulse out and sync signal.	455775
Remote Emulation: *IDN* and *OPT? strings can not be entered via touch screen. External keyboard or mouse required	657096
SMW-WB: Mode Advanced, Digital Only (HS): error while mapping connector BBMM2/7 to any stream.	708241
Sporadic error message when switching between some fading configurations. The simulated signal is not affected.	818966
Wideband SMW, GSM: level at slot 8 for levatt 7 value is wrong	334932
SMW-K980 HUMS: SNMP Interface fails when requesting long data blocks	904603

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

Radar:		
	REG: For 2xK78 and addition of both streams in Stream Mapper: automatic level calculation not working correctly in all cases	183053
	REG: For signal routing to both REGs and addition in Stream Mapper, Automatic System Latency measurement not working in all cases	252364

1.14 Version 4.90.049.47

Released: August 2021

New Options
● -

New Functionality / Changed Behavior	
SMW-K553 Support for 2nd frequency band configuration	809273

1.15 Version 4.90.049.40

Released: June 2021

New Options
● SMW-K147   IEEE 802.11BE
● SMW-K447   IEEE 802.11BE with R&S®WinIQSIM2
● SMW-K175   U-PLANE GENERATION
● SMW-K553   EXTERNAL FRONTEND SUPPORT
● SMW-K980   HUMS
● SMW-K71   DYNAMIC FADING for B15
● SMW-K820   CISTOMIZED DYMAMIC FADING for B15
● SMW-K823   FADING EXTENSION TO 800 MHZ

New Functionality / Changed Behavior		
Digital IQ: HS digital IQ enabled in system config mode Advanced - Analog&Digital		813275
New Option SMW-B2044.New Option SMW-B2044N.New Option SMW-B2031		644588
SMCV100B supported as external RF (extension) for SISO/MIMO scenarios in SMW200A (B13XT) Mode Advanced / Analog & Digital (HS)		775305
SMM100A supported as external RF (extension) for SISO/MIMO scenarios in SMW200A (B13XT) Mode Advanced / Analog & Digital (HS)		775303
SMM-K811, Notched Signals, is implemented		817460
The 800 MHz baseband bandwidth can be configured in the Fading/Baseband Config 'Advanced' mode. See SMW data sheet for more details..		773633
The terms Master and Slave have been replaced by Primary and Secondary in documentation, user interface and remote control. Previous remote control commands continue to be valid in order to maintain compatibility.		777014
5G New Radio		
General	Dummy Data serves OCNG 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

GNSS		
	Improved antennas position visualization	596054
	Support for Assisted-GNSS logging	762436
	Support for higher simulation velocities	769075
	New experimental SBAS Signal Exp L5: WAAS L1 signal and EGNOS L1 signal on L5 carrier (not compliant to SBAS L5 ICDs)	743973

Radar		
	REG: RCS Model Swerling 1-4, User Lists (amplitude, phase), Restart Mode Armed Auto (internal, external)	743071

802.11		
	802.11be: first feature set including the non-OFDMA mode	732639

HWP-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

Fixed Issues	
3GPP: Specific waveform files cannot be played back if only ARB file playback options (no internal options) are present.	811790
AWGN: Setting range CW Frequency Offset and Center Frequency Offset might be too large. Affected devices: SMW-B9, SMW-B10, SMM, SMCVB.	786178
Baseband Error - Fader: WaitTillDownlinkFlagOn() No DATA_DONE when changing system configuration	815601
DIGIQ_SYSCONF: SMW-B9 via HS DIG I/Q with external Evalboard (K552): recommended to use Sample Rate Source = User Defined	830126
External connection CODER IN: Connected FSW get unwanted scpi commands	808164
Fading: SCM coefficients could be wrong in case of MS zero speed.	800457
Fixed bug where high level spikes can appear during Power level or frequency change. Problem mainly occurred for signals with high crest factor	807989
Full attenuation during RF off is not set when IQ modulation is active	750322
K548 Crest Factor Reduction: improved output crest factor accuracy for a variety of different signals.	771072
LXI-web-GUI: 'download log entries as CSV' (Diagnostics - SCPI Remote Trace) is not working with 4.80.xx	791471
SMW-B10: modes with 5-8 output streams sometimes loose the signal when individual baseband sources are turned off.	819129
SMW-B15: sporadic Fader Error 0x800B when changing the Fading configuration	830864
Switching the system configuration through loading a settings file causes a firmware crash in some cases.	790653
The frequency deviation for FM modulation in path B is 10% lower than expected (with V4.80.xx only)	830215
When reading NRP-Z power values via SCPI while Power Viewer is on an unintended settings conflict arises.	780259
OneWeb User-Defined Signal Generation: Reverse link: HARQ issue for 8PSK according to Rev D spec.	800759
OneWeb User-Defined Signal Generation: Reverse link: Issues on 8PSK PUSCH.	832153
Issue for the preset values of some 5G Release 16 HST fading models.	806098
3GPP: Downlink: Crash with certain channel coding configurations.	809765

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 (separate System Config)	808704
	Configuration issue for data list files in case of more than one user.	787883
	K81 output files are named: "<filename>.json.json" rather than "<filename>.json"	783420
	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 local connector for test cases with closed loop feedback on devices equipped with B9.	821470
		Incorrect RB offset of interfering signal of 7.4.2B in lower frequency	826900
		Issue for some configurations of 8.4.1.	801562
	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 datasource 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
	Test Case Wizard	For TC 8.3.3 the mode for splitting up the test over two devices is not working properly.	138540
		Incorrect local connector for test cases with closed loop feedback on devices equipped with B9.	821299
		The 2x2 tests of TC 8.3.9 are not configurable.	138541
	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
	On the fly changes of the Reference Power do not work in GNSS Advanced mode. The GNSS state needs to be toggled off / on to update the power level.	781247
	Possible misalignment of user motion file generated by offline logging due to additional delimiter at the end of each row.	761387

Custom Digital Modulation		
	Activated power ramping disables subsequent use of other baseband standards.	809913

Radar		
	K503/K504: Changed PDW format parameter from Variant 1/2 to Basic Format and Expert Format. SCPIs changed as well. Old SCPIs are backward compatible.	774481
	K503/K504: Removed 5ms muting time after a CNTRL PDW. Please refer to the datasheet to find a suitable time for which no PDWs should be executed after the CNTRL PDW	758083
	REG: Calibration Mode (MAN/AUT) and User List file path not loaded correctly when using internal SavRcl (REG:STOR, REG:LOAD)	827933
	REG: Copy Object - RCS Peak Value for Swerling 3+4 is not copied in all cases. Test Coverage for Swerling 1+2 changes from 95.02% to 95.00% with Preset This Parameter.	826098
	REG: With low/high Mean RCS, Probability/CDF graphic disappears or is wrong	826025
	REG: With Save/Load Object: object name disappears, object type not loaded	825522

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
Digital IQ		
	Bugfix for SMCVB and SMBVB Auto Level Set function	782538
	Fixed firmware crash in combination with internal graphics	800596
	Incorrect mapping of digital IQ HS output channels at BBMM2 in some cases.	801052
	Leveling partly incorrect when switching between baseband input and internal baseband.	704730
	Samplerate and level info mistakenly updated at the receiver even when state is off.	771987
HWP-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	
Remote Emulation: *IDN* and *OPT? strings can not be entered via touch screen. External keyboard or mouse required	657096
SMW-B15, 0xK822, 0xK823: In some cases SISO signals with BBBW 400 MHz or 800 MHz are blocked.	829941
SMW-WB: Mode Advanced, Digital Only (HS): error while mapping connector BBMM2/7 to any stream.	708241

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

1.16 Version 4.80.041.66

Released: May 2021

New Options
● SMW-B2044   100 KHZ - 44 GHZ, PFAD B
● SMW-B2044N 100KHZ-44GHZ, PFADB, LIM.BW
● SMW-B2031   100KHZ-31,8GHZ, PFAD B
● SMW-B2012   100KHZ-12,75GHZ, PFAD B

1.17 Version 4.80.041.57

Released: January 2021

New Options
● -

Fixed Issues	
Switching the system configuration through loading a settings file causes a firmware crash in some cases.	790653

1.18 Version 4.80.041.48

Released: December 2020

New Options
● SMW-T0   TRIAL LICENSE (3M)
● SMW-K69   LTE Closed-Loop Base Station Test for B9 now
● SMW-K97   NAVIC/IRNSS
● SMW-K148   5G NR Release 16
● SMW-K448   5G NR Release 16 WinIQSIM2
● SMW-K149   HRP UWB
● SMW-K449   HRP UWB WinIQSIM2
● SMW-K360   eraGlonass Test Suite
● SMW-K361   eCall Test Suite
● SMW-K362   GNSS Test Suite
● SMW-K822   Fading extension 400 MHZ

New Functionality / Changed Behavior	
Bluetooth: Added AOD antenna gain feature.	706197
dacboard now with temperature surveillance	735517
DIGIQ_SYSCONF: re-adjust BB-selector state when number of BBin channels changed and BB-selector state was dedicated to a non-active channel number.	703966
HRP-UWB: First version to support options K149/K449 (UWB-HRP).	697359
HRP-UWB: Support of 802.15.4, 802.15.4-BPRF and 802.15.4-HPRF Modes.	697359
OneWeb User-Defined Signal Generation: Uplink: PUSCH UCI updates according to specification revision D.	732250
Renamed FCC-0696-T6Sim.xls to FCC-0696-T6Hop.xls..Renamed FCC905462D02v02-T6Sim.xls -> FCC905462D02v02-T6Hop.xls	768069
Fading: Support of 5G NR release 16 500 km/h HST models of 38.104. K71 option needed.	734168
Fading: Support of 5G NR release 16 350 km/h HST and moving propagation models of 38.104. K71 option needed.	725870

5G New Radio			
General	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 SMW-K148 (5G NR Release 16) and SMW-K448 (5G NR Release 16 (WinIQSIM2)).	629977	
	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	
	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	
	Frequency for the RF upconverter phase compensation can be determined automatically by means of the RF frequency also for Coupled System Configurations at least in some cases.	654104	
	Marker mode "TDD UL/DL".	692441	
	Usability functionality which eases the configuration for carrier aggregation.	704363	
	Allow less carriers than given by system configuration.	689175	
	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 in "separate" system configurations (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 and 8.	700267	
	Test case wizard for base station conformance tests according to 38.141-2, chapter 7.	633100	
Downlink	MIB SFN increment independently from the configured sequence length (K148 needed, not for instruments with SMW-B10 option).	652900	
	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	Support for closed loop timing adjustment, needed for release 16 base station conformance tests according to 3GPP TS 38.141. Options K148 and K145 needed.	643631
	Configured PUCCH, PRACH allocations can be copied to another slot.	692975
	Power mode "burst" also for PUCCH channels.	702930
	Support for time shift according to N_TA_offset.	714547
	Allow SRS in K145 feedback mode.	735216
	Provide K145 RV configuration through HPN association.	663983
	Support for group and sequence hopping.	683707
	Optionally create K145 debug log files.	697464
	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
EUTRA/LTE		
General	Some LTE / IoT options have been renamed for simplification.	759109
Downlink	Downlink PBCH SFN repetition mode "3GPP" is now also available on SMW with option B9.	554328
Uplink	Option SMW-K69 is now also available on SMW with option B9.	554328
	For K69 closed loop feedback it is optionally possible to ignore timing adjustment commands.	663988
GNSS		
	QZSS supports L2C and L5 and new GEO satellite	717330
	IRNSS L5 SPS supported	709039
	SMW-B9: GNSS 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
Radar		
	K503/K404: Introduction of a new PDW format, which offers several new features like:- Rising/Falling Edges.- Pre/Post Marker.- Burst PDWs.- 54 Bit TOA	630168
	K503/K504: Introduction of a new CNTRL PDW that rearms the SMW	747556

Fixed Issues	
3GPP FDD: Sporadic crash in case of R99 channel coding with user settings (i.e. not predefined RMCs).	**657747**
ARB, SMW-B10: Trigger delay in 8x1x1 mode not applied correctly for some streams	**704781**
Bluetooth LE 1M: CP flag not set and CTEInfo byte missing despite being activated	**702243**
Bluetooth: Changed max limit of Advertising Packet Interval to 28ms	**719815**
Devices equipped with B140N/B144N/B1040N/B1044N showed signal distortions above 19.5 GHz RF frequency	**724389**
Fading in REG mode: frequency offset of BBIN doesn't work	**743525**
For some instruments and system configurations, fader error messages show up when recalling old setup files.	**760046**
For specific instrument configurations, the AWGN state in the block diagram does not follow the state in the AWGN dialog.	**761699**
Frequency setting: First increment step by UI entry uses wrong value	**726278**
Incorrect envelope tracking output voltage when option K541 is not installed.	**755972**
Incorrectly delayed pulse modulator input signal for external signal source.	**771953**
Incorrectly displayed error message PEP value greater than defined limit in cases where 2 noise only signals are added in the IQ stream mapper.	**729228**
Issue with option K17 in case of coupled system configurations.	**709435**
NRP-Z Support: READ disables sensor	**668481**
OFDM signal generation: Issue when exporting the configuration for R&S signal analyzers.	**729109**
Pulse generator: trigger mode ExtSingle not selectable	**696009**
SMW-B10: Multi Instrument Trigger mode not working correctly.	**713165**
SMW-B9 Envelope Tracking: Transient phase during activation of IQ output leads to bias applied to I+ and not I- for a short period, until final signal becomes active.	**659556**
SZU internal adjustments do not work with some hardware configurations	**775046**
Undesired output signal on TMC connectors of fader boards	**721675**
SMW-B9: Markers of baseband C and D selectable in GUI, but unavailable in hardware.	**745417**
On instruments with B13/B13T (i.e. not wideband B13XT) there can be a situation where there is no signal after an addition in the IQ stream mapper, depending on the configuration order.	**709151**

5G New Radio		
	Using the fast filter in advanced system configurations for large carrier bandwidths may result in a distorted signal.	740786
	Error message for some quick settings configurations.	752892
General	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

	Possible issues when double-applying the same system config.	723767
	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
	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
	Internal error for coupled system configurations and delta f offset.	723834
	Save/recall issue for the new PN initialization value.	725419
	Auto phase compensation is faulty after a restart of the instrument.	726513
	Auto phase compensation does not work for some SMW instrument configurations.	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
	Time plan issue when using more than one baseband block.	679878
	Signal calculation error for very small BWPs.	693600
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
	Configuration issue in case of more than one "custom" DCI.	723273
	PT-RS: Issue in sequence generation with Mapping Type B.	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 in separate mode 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
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
	The path selected for K145 log files could be ignored and the files are written directly to the "share" or "user" path.	711528
	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
	Error messages in case of some values of additional user delay for K145 closed loop feedback.	550006

	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
OneWeb User-Defined Signal Generation		
General	State of notched signals cannot be changed by remote control command.	699453
Uplink	Issues on 8PSK PUSCH with CQI signal (second issue).	701614
	Issue for UCI on 8PSK PUSCH.	711077
	Issues for CQI on PUSCH.	715315
	Issue when recalling settings (subframe configurations missing).	711971
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
Custom Digital Modulation		
	Incorrect output of binary control lists on SMW-B9	689699
	SMW-B10: IQ signal does not return to zero in single trigger mode with FSK modulations.	709808
	When switching the baseband off and on again, data list files that changed on disk in the meantime were not correctly updated.	725732
Radar		
	K501: Fixed potential freeze when using waveform segments with a duration > 200ms	737786
	K501 4x1x1 system config mode has an issue with ARB PDWs. This problem occurs only with setups that include B14 fader boards.	408671
	K502: Loading of large PDW files took a long time.	620481
	K503/4: A static IP address for the RTC interface was forgotten after restarting the instrument	717188
	K503/4: Repetitive on/off switching of the RTCI mode could lead to an abort of the TCP/IP communication from the DSP side. Data was lost..K503/4: Repetitive on/off switching of the RTCI mode could lead to communication errors between the host and the DSP. SCPI errors where generated.	729806
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
	802.11ac: Encoding of long VHT frames incorrect.	704066
	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 channel encoding for MCS > 9 in MIMO modes.	704059
	802.11n: Incorrect LDPC encoding with some specific data lengths.	716913
	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

Known Issues	
Bug in relative phase	736547
SMW-K550 is not allowed with one SMW-B14	684917
SMW-WB: Mode Advanced, Digital Only (HS): error while mapping connector BBMM2/7 to any stream.	708241
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

1.19 Version 4.70.128.50

Released: October 2020

New Options
● None

Fixed Issues	
Devices equipped with B140N/B144N/B1040N/B1044N showed signal distortions above 19.5 GHz RF frequency	724389
5GNR: General: Configuration issue for trigger mode "single sequence" (second issue).	720566

1.20 Version 4.70.128.48

Released: August 2020

New Options
● None

● Fixed Issues	
Bug in limit check leads to sporadic erroneous fail of internal adjustment	724570
RF Port Alignment: external LO frequency is wrong configured when RF frequency is not equal to the calibrated frequency	717069
5GNR: General: Configuration issue for trigger mode "single sequence".	697014
Incorrect adjustment information in some cases	722841
Dacboard now with temperature surveillance	735517
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
During LO coupling, internal synthesizer signal was still visible in some cases	732050
Fader boards: sometimes unwanted signal on TMC connectors	721675
Linux: Reentrancy-Problem X11	726152

1.21   Version 4.70.128.43

Released: June 2020

New Options
● SMW-K297   NAVIC/IRNSS (WINIQSIM2)
● All following GNSS Options with SMW-B9 now
● SMW-K44   GPS SATELLITES (MAX. 24 CHAN.)
● SMW-K66   GALILEO (MAX. 24 CHAN.)
● SMW-K94   GLONASS (MAX. 24 CHAN.)
● SMW-K98   MOD. GPS (MAX. 24 CHAN.)
● SMW-K106 SBAS/QZSS
● SMW-K107 BEIDOU (MAX. 24 CHAN.)
● SMW-K108 REAL WORLD SCENARIOS
● SMW-K109 REAL TIME INTERFACES
● SMW-K132 MODERNIZED BEIDOU

All following GNSS Options with SMW-B9 only

- SMW-K134 UPGRADE TO DUAL-FREQUENCY
- SMW-K135 Upgrade to triple-frequency
- SMW-K136 ADD 6 GNSS CHANNELS
- SMW-K137 ADD 12 GNSS CHANNELS
- SMW-K138 ADD 24 GNSS CHANNELS
- SMW-K139 ADD 48 GNSS CHANNELS

New Functionality / Changed Behavior		
802.11ax: Added support for proprietary 4096 QAM modulation		654426
Baseband selftest: Detailed results available via :TEST:BASeband:LOG?		623916
Dig. IQ HS auto setting of levels supported		658000
K315: Marker signals of individual sequencers can be routed to the local TMC connectors of the individual boards		580473
PRBS, patterns are supported as a message type		633272
SCPI Recording Export: Python template available		620257
SMW-B13XT: new Signal Outputs Analog & Digital (HS) available. Supports second SMW-B13XT as External RF via 2x 40G HS DIG I/Q connection.		664109
The navigation message can hold PRBS sequence		633568
OFDM signal generation: Exported xml settings are less redundant.		620177
5G New Radio		
General	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
	Crest factor reduction (K548 needed).	591092
	For coupled system configurations more component carriers can be configured than given by the system configurations (needed for carrier aggregation application with more than one instrument).	661512
	GUI cleanup regarding DMRS antenna port configuration.	676799
	Improvements of the "quick settings" functionality.	712941
	Possibility to restart data and control payload in each allocation.	649325
	Power mode "Burst".	589595
	Quick settings only use mapping type B if really necessary.	677175
	Relative powers for carrier aggregation.	663296
	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 extended cyclic prefix in the Quick Settings.	663474
	Support of non-average power modes for filter mode "fast".	654092
	The allocation used as reference for power mode "Burst" is indicated in the scheduling table.	664011
	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
	Possibility to zoom into time plan.	623927
	Additional information is shown regarding powers of several signal parts and in reference to several bandwidths.	634188
	Further capabilities of the "Quick Settings" functionality.	639689
	The BWP size is set to maximum now also on deployment and SCS change.	644204
	Calculation speed improvement.	636646
Test Case Wizard	Test case wizard for base station conformance tests according to 38.141-1, chapter 6 and 8.	628968
	Updated chapter 7 test cases to version 15.3.0 of 3GPP TS 38.141-1.	643576
Downlink	CBG based transmission.	664004
	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 further RNTI types.	659412
	Support for PDSCH PRB bundling.	618711
	Support for DCI format 2_3.	632554
	Support for dynamic HARQ-ACK codebook mode selection and DAI bits in DCI.	632845

Uplink	Power mode "Burst" now also supports PRACH.	680287
	PUSCH frequency hopping.	617538
	Support for SRS frequency hopping.	617559
	Support larger payload for UCI.	654089
EUTRA/LTE		
Downlink	K81 logging for NB-IoT wakeup signals (NWUS).	673344
	NB-IoT wakeup signals (NWUS).	618878
Uplink	Support for NB-IoT early data transmission.	633084
	For eMTC or NB-IoT UEs in coupled system configurations the output of the baseband block can be selected.	641928
GNSS		
	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
K315 Pulse-on-pulse simulation		
	Marker signals of individual sequencers can be mapped to the local TMC connectors of the individual boards	580473

Fixed Issues	
802.11: incorrect sequence duration for single trigger mode	697685
802.11: Inverted transmission order of HT Control/VHT Control field of MAC header	686282
802.11: Limit L-SIG length field value to 4095.	697661
802.11ac: Fixed padding subfield in the last A-MPDU subframe for VHT and HT frames.	695149
802.11ac: Bugfix for VHT-20 with LDPC and MCS9.	692399
802.11ax: 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
After changing system configuration, an input connector's threshold and impedance can be configured incorrectly.	680376
ARB Waveforms are limited to 512MSamples	458971
AWGN: Incorrect signal output power in some cases with AWGN C/N values << 0dB while adding 2 or more channels in the I/Q stream mapper.	694391
BBin Interface HS DIG I/Q: sample rate might be incorrectly rounded	627442
Bluetooth: automatically adjust sequence length according to configured parameter sets with active dirty transmitter test	684304
Custom Digital Modulation: Effective single trigger sequence length shorter than specified value, especially for low symbol rates	539878
Digital Impairments: applied I/Q offset values ~10% too high	644612
Disable DigIQ Output-Connector FADER2 in GUI for MIMO 2x3x3, 2x4x3	688696
Due to rounding errors in 32 Bit Linux SW, the max AM Depth 1/2 values are limited to values which are 0.01% smaller than specified one, in case that the both AM states are ON.	600789
K548 Crest Factor Reduction: CFR feature not working without installed option K811	692124
List Mode: Offset and Multiplier are taken into account in the List Mode table	621656
Multicarrier-CW: Incorrect restart marker in some cases when occupied bandwith close to maximum available baseband bandwidth.	672066
Signal Routing (non-MIMO): Problem with B9 and B15	671610
Signal timing of connected SGTs is wrong in case of instruments equipped with B15.	672259
SMW-K810 : Phase Noise settings do not become effective, when AWGN menu is not active.	653915
SMW-K810 Phase Noise: user profile accuracy and stability improved	590671
SMW-K810: with high phase noise levels output signal is disturbed.	653908
User Correction: Fill operation of table editor does not work	682122
OneWeb User-Defined Signal Generation: Uplink: Issue for PUSCH interleaver in case of 8PSK.	669925
OneWeb User-Defined Signal Generation: Uplink: Issues on 8PSK PUSCH with CQI signal.	701614
5G New Radio	

General	Bad ACLR when clipping mode is active.	576437
	Cell Mapped button has no effect.	673302
	Configuration of invalid combination of CFR and power modes is possible.	674301
	Errror messages when using carrier aggregation in "separate" system configurations an specific carrier spacing.	663774
	For some data source paramters, the signal is not reliably recalculated on value change.	662475
	GUI issue for the mapping of cells to ouputs.	689177
	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
	Invalid combination of CFR and specific power modes is possible.	666742
	Issue for "display powers" when working with more than one baseband block.	656687
	Issue in case of certain PTRS settings.	661368
	Issue in case of PTRS and PDSCH/PUSCH for several antenna ports.	684963
	Issue when using the "quick settings" in basebands C or D.	683108
	On specific carrier aggregation settings a "maximum resampler input rate exceeded" error is shown.	672040
	UI configuration and range issue around carrier aggregation delta f parameter.	686932
	When applying quick settings, the number of RBs might not be taken over reliably.	672629
	When working with RBGs, some GUI paramters could not be updated when changing others.	645250
	Issue for PTRS in case of Auto-DCI.	649925
	EVM degradation for specific carrier aggregation settings in case of "separate" system configuration.	648464
Test Case Wizard	Frequency calculation issue for TC 7.4.2B.	655948
	The test case wizard does not work on instruments with certain RF options.	652222
Downlink	Coreset Aggregation Level issue when increasing Number of Allocations.	696277
	Coreset issue in case of TDD if "quick settings" is used.	659697
	dmrs-AdditionalPosition is not calculated reliably in case of Auto-DCI.	657786
	Issue for querying some of the DCI parameters by SCPI.	679709
	Issue for some short DCI.	687824
	Issue when recalling DCI parameters from old files.	696146
	PDSCH TxScheme configuration is not visible for certain settings.	660373
	Scrambling issue for PDSCH in case of AutoDci and specific RNTI types.	668913
	MIB configuration issue in case of more than one cell.	647938
	DCI issue for time domain allocation list.	647978
	Issue for VRB-to-PRB mapping in specific cases.	650337
	Issue for time domain allocation list for certain values of K0.	639532

Uplink	Configuration issue for SRS number of antenna ports in case of several SRS ressources.	678007
	Cyclic Shift Issue for PRACH Restricted Type B in very limited configurations.	663971
	For four PUSCH Mapping type B configurations the number of DMRS symbols is not correct.	691066
	For some system configurations, a DSP configuration error pops up when using K145 closed loop feedback.	679474
	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.	662858
	Issue for certain PTRS configurations.	651219
	Issue for FRC with mapping type B in some beta versions.	684758
	Issue for K145 HARQ feedback in case of more than two slots per subframe (i.e. 60 kHz SCS or higher).	660638
	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; dataScramlbingIdentityPUSCH)	642447
	Issue for specific PRACH cases.	680813
	Issue with specific PUSCH UCI configurations in case of PTRS.	683455
	Issue with specific PUSCH UCI configurations in case of PTRS.	667385
	Minor issue of PTRS in case of PUSCH transform precoding.	673529
	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 != 0.	688130
	With activated FRC usability functionality not all settings are recalled correctly from setup files.	678333
	Configuration issue of PRACH custom repetition.	646112
EUTRA/LTE		
General	For NB-IoT, RB frequency positions are not reliably updated if other paramters are changed in the UI.	647713
Test Case Wizard	A fader error message can show up when applying certain test cases twice.	651525
	RF state might be reset on applying a test case.	623190
	The test case wizard does not work on instruments with certain RF options.	652222
Downlink	DCI issue for NB-IoT.	604942
	Crash for DCI type "none" in case of Auto-DCI.	645499
Uplink	For some configurations the NB-IoT NPRACH is incorrect.	652958

	If PRACH and PUSCH users (or NPRACH and NPUSCH users) are mixed in a single baseband block, the relative leveling can be wrong.	633630
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
Radar Echo Generation		
	For Moving Object with Start-Range > End-Range, Level might be clipped. Workaround: turn object off and on again	183039

Known Issues	
Fading with 2xSISO: Restarting fading on one path also restarts fading on the other path.	418298
GPIB: Under some circumstances VI_GPIB_REN_DEASSERT does not go to local	299635
K544: In some rare cases while compensating frequency responses with high dynamic ranges (> 15 dB) and using ALC setting Sample & Hold, the absolute level compensation may have an additional level error.	380795
NRP-Z Support: READ disables sensor	668481
Pulse generator external gated mode: Pulse delay applies delay to both pulse out and sync signal.	455775
Remote Emulation: *IDN* and *OPT? strings can not be entered via touch screen. External keyboard or mouse required	657096
SMW-B10: Phase offset in stream mapper only applied when triggering the baseband.	465334
SMW-K80: no signal output for BER TestGen Data and BER TestGen Clock.	451583
Wideband SMW, GSM: level at slot 8 for levatt 7 value is wrong	334932

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 occured before.	707675

Radar Echo Generation		
	After changes on analyzer, latency is not reduced to minimum. Workaround: Turn BB Input off and on again	213415
	For 24 Moving Objects with different velocity after some minutes DSP-Error 0x8004 is observed	183034
	For 2xK78 and addition of both streams in Stream Mapper: automatic level calculation not working correctly in all cases	183053

	For signal routing to both REGs and addition in Stream Mapper, Automatic System Latency measurement not working in all cases	252364
K502 Wideband Ext. Seq		
	Loading of large PDW files took a long time.	620481

1.22   Version 4.70.026.51

Released: January 2020

●	New Options

- SMW-B144   100KHZ-44GHZ, PATH A
- SMW-B144N 100KHZ-44GHZ, PATH A, LIM.BW

- **SMW-B1003   100KHZ - 3 GHZ,HF PFAD A**
- **SMW-B1006   100KHZ TO 6GHZ, RF PATH A**
- **SMW-B1007   100KHZ-7.5GHZ, RF PATH A**
- **SMW-B1012   100KHZ - 12.75GHZ, PATH A**
- **SMW-B1020   100KHZ TO 20GHZ, PATH A**
- **SMW-B1031   100KHZ - 31.8GHZ, PATH A**
- **SMW-B1040   100 KHZ TO 40 GHZ, PATH A**
- **SMW-B1040N 100KHZ-40GHZ,PATHA,LIM.BW**
- **SMW-B1044   100KHZ TO 44 GHZ, PATH A**
- **SMW-B1044N 100KHZ-44GHZ,PATHA,LIM.BW**
- **SMW-B2003   100KHZ TO 3 GHZ,RF PATH B**
- **SMW-B2006   100KHZ TO 6GHZ, RF PATH B**
- **SMW-B2007   100KHZ-7.5GHZ, RF PATH B**
- **SMW-B2020   100KHZ TO 20GHZ, PATH B**
- **SMW-B709   LOW PHASE NOISE, PATH A**
- **SMW-B710   IMPR. CLOSE IN PHASE N**
- **SMW-B711   ULTRA LOW PHASE NOISE**
- **SMW-B719   LOW PHASE NOISE, PATH B**
- **SMW-B720   IMPR. CLOSE IN PHASE N**
- **SMW-B721   ULTRA LOW PHASE NOISE B**
- **SMW-K703   100 MHZ, 1 GHZ REF IN/OUT**
- **SMW-K704   FLEXIBLE REFERENCE INPUT**
- **SMW-K720   AM / FM / PHIM**

- **SMW-K72   ENHANCED FADING MODELS for option B15**
- **SMW-K73   OTA-MIMO ENHANCEMENTS for option B15**
- **SMW-K132   MODERNIZED BEIDOU**
- **SMW-K432   MOD. BEIDOU (WINIQSIM2)**
- **SMW-K548   CREST FACTOR REDUCTION**

New Functionality / Changed Behavior	●
802.11ax: added support for 4xLTF + GI 0.8us	637222
Added functionality: Crest factor reduction on arbitrary waveform files with new option K548.	589671
Increased range for stream mapper frequency offset in case of instruments with B15 and advanced system configurations.	581358

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
OFDM signal generation: XML export functionality is now accessible via the user interface.			573487

5G New Radio			
Downlink	Define the CORESET RBs by means of a frequency domain bitmap.		627756
	Support for DCI format 2_0, 2_1, 2_2.		615140
	Support for PDSCH rate matching patterns.		581301
	Support for quasi co-location TCI field in DCI1_1.		612790
	Support for selection of active UL BWP for CORESETs (needed for DCI).		587519
	Support for SFI-RNTI, INT-RNTI, TPC-PUSCH-RNTI, TPC-PUCCH-RNTI, TPC-SRS-RNTI.		615141
General	"Quick Settings" feature for fast and convenient setup of the 5G NR signal configuration.		608818
	Filter mode "fast".		589713
	Logging of intermediate results by means of option SMW-K81.		598704
	More information is shown in the info sections, especially for PDSCH/PUSCH channel coding.		601592
	Overlapping allocations are indicated in the scheduling table.		580309
	Resource allocation type 0 also for PUSCH and for manually configured PDSCH (i.e. without DCI).		600970
	Several improvements for the time plan.		608680
	Showing additional information also for configured allocations, not only the ones created automatically.		599430
	Support for user defined filters.		619702
	Test model selection can be filtered for easier access.		490776
	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 7.		416248
Uplink	PTRS for PUSCH (with transform precoding).		565942
	Repetitions now also for PRACH.		616251
	Support for special MCS values 29 to 31.		611710
	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
	TDD for NB-IoT downlink.		609553
Uplink	Cell ID can be overridden also for eMTC/NB-IoT UEs.		621647

	Support for V2X RMCs of 3GPP TS 36.521.	630475
	Support NB-IoT scheduling request by means of release 15 NPUSCH format 2.	611628

Fixed Issues	
802.11: added new IFFT Upsampling mode for improved EVM with lower bandwidths.	587631
802.11ax: Incorrect tone rotation for second segment in HE80+80 mode with both segments active at the same time.	606751
802.11ax: post-FEC padding bits can cause high signal peaks in some specific configurations	619872
802.11ax: PPDU CRC incorrect for HE-SU 160MHz	648843
Bluetooth: inverted transmission order for patterns of BT Low Energy test packets	613652
Custom Digital Modulation: no DC offset for ASK modulation with Split Phase filter	564905
In case of fading with configured constant doppler shift and a certain sequence of configuring the instrument by means of SCPI, the used doppler shift and speed can be wrong.	608019
In some cases the RF level of a connected SGT is wrong when AWGN is used (B13XT only).	616592
LF generator shape pulse not working	635852
Multi-Instrument Trigger with SMW-B13XT has sporadic additional delay of 3.3ns after reboot of device and/or system configuration mode changes (standard, advanced mode).	609330
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
OneWeb User-Defined Signal Generation: General: 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.	617076
OneWeb User-Defined Signal Generation: Uplink: Issue for 8PSK modulation.	643779
OneWeb User-Defined Signal Generation: Uplink: Issue for PUSCH delta sequence shift.	643683
Pulse Generator: Wrong resolution of Timing settings	647596
Save Object/Load Object in Object Configuration is not working	618523
SMW-B13XT/SMW-K62: Show Powers For Output for BBMM1/2 available	611261
SMW-B15: 1x8x8 mode with only subset 2 active: stream E-H mapping incorrect.	612133
SMW-B9: ARB memory limited to 500 MSamples for baseband C and D in 4xSISO	615232
SMW-B9: Symbol clock output on local T/M/C 1 connector not working.	616895
SMW-K19: Digital I/Q Outputs dialog just displays BBMM1 and BBMM2 in System Config Mode Advanced/Digital Only HS, independent on MIMO/SISO config.	575974
SMW-K76 (used with SMW-B14): Wrong Baseband Frequency Offset for 5...8xSISO. Corrected to +/- 40 MHz.	614819
SMW-K821: Corrected mapping (stream - output connector) in Stream Mapper for 1x8x8 Subset 1 and 2.	611048
The maximal number of TCP/IP SCPI connections was increased to 6.	620869
UCOR path B: fill list with power sensor: no sensor selectable	629199
V5GTF: General: 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.	617075

:SYSTem:HELP:SYNTax:ALL query returned a wrong argument list for some numeric parameters.	613849
For SMW-B9 hardware, in case a signal is applied to local TM1/TM2/TM3/TM4 connectors already during firmware startup, the instrument can possibly enter a state where it shows a lot of errors regarding failing board detection.	605082

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
	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 automatically created PDSCH in case of used time domain allocation list.	647369
	Issue for CSI-RS in case of certain relative powers.	610327
	Issue for HPN field in DCI 1_1.	625472
	Issue for time domain resource allocation list in case of SI-RNTI.	642174
	Issue in case of DMRS add. pos. index in case of DCI 1_1 scheduled PDSCH.	633863
	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
	Issue when using time domain allocation list in combination with PDSCH mapping type B.	639541
	Issues for time domain allocation list.	605792, 614104
	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
	Rate matching around LTE-CRS (LTE / 5GNR coexistence): Issue in case of some LTE channel bandwidths.	624999
	Scrambling and channel coding is incorrect in NR_TMs 1_2, 3_2, 3_3.	626915
	TBS is not correctly displayed in case of two code words.	613595
	The time domain allocation list's symbol offset cannot be configured properly in case of more than one user.	620042
	VRB-to-PRB DCI bit is present in non-interleaved mode.	649839
	Wrong transport block size in case of PDSCH overlap with SSPBCH or in case of activated rate matching around LTE-CRS.	625074
General	After switching off and on the instrument, not all 5GNR parameters are restored reliably.	650625
	BWP size is not always correctly adapted after channel BW change.	644197
	Configuration issue for data list files in case of more than one user.	648678

	Configuration resolution of phase precompensation frequency is not sufficient.	629202
	For a certain sequence of configuration, an allocation's antenna port table can end up in a faulty state.	634293
	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 of power mode constant PSD and specific settings, fader errors show up for instruments equipped with B14.	567694
	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
	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 TBS calculation in case of activated PTRS or number of CDM groups other than 2.	596905
	Issue in case of more than eight component carriers.	647150
	Loading settings or selecting a test model in baseband other than A does not always work properly.	612373
	PTRS issue for BWPs with RB offset.	642657
	Save/recall issue for AP tables in case of some system configurations.	610823
	SCPI issue for PDSCH/PUSCH antenna port selection.	634842
	SCPI issues for PTRS configuration.	629055
	Unlocking protection level 1 for detailed 5GNR internal state information can cause firmware stability issues.	628557
Uplink	Closed loop HARQ feedback on B9 instruments: Certain values of additional user delay" do not work reliably in case of "advanced" system configuration on B9/B15 instruments.	643289
	Configurable range of SRS resource sets is wrong.	628825
	Displayed number of symbols for SRS are confusing.	599968
	Fix for PUSCH UCI in case of mapping type B.	635768
	For specific PRACH cases and filter mode "per BWP" the signal calculation fails.	628999
	In case of activated FRC, not all depending settings are updated reliably.	625464
	In case of SMW-K145 closed loop feedback, the signal timing in respect to an external trigger event is wrong.	627054
	Issue for PRACH in case of filter mode "Channel BW"."	645165
	Issue of power mode "constant PSD" in case of PRACH.	632567
	PUCCH generation fails with an error message for specific scheduling configurations.	634177
	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	In case of missing K146 option, the release switch of downlink users is invalid by default.	611376	
	NB-IoT carrier RB index is not reliably updated after channel BW change.	635586	
General	After NB-IoT channel bandwidth change, the signal might not be 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	
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	Configured NPRACH resource block index is sometimes not used correctly for signal generation.	642721	
	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 V2X MIB coding in PSBCH.	642810	
	NPRACH delta f is not working correctly for some UEs.	642748	
	On instruments with IoT options but without specific LTE options, uplink users cannot be configured for IoT.	625033	
	SCPI issue for NPRACH start time.	645175	
GNSS			
	Log files are unintentionally emptied	586818	
	Very high satellites 'Reference Power' is observed when instrument's Level is changed by 'rotary knob'	604445	
	After several hours simulation time with the hardware limit almost reached, some handover satellites are sporadically not activated.	537810	
	All GNSS Signals with BOC modulation could show discontinuities in the chip transitions.	602179	
	For some receivers single Glonass satellites are periodically lost in PVT solution for several seconds.	485775	
	Glonass navigation message differs from 3GPP values when using predefined scenarios	544728	
	Glonass satellites are not in fix anymore if turned off and on in realtime.	451913	
	Higher output power after rebooting while GNSS is running	608672	
	Inconsistencies in broadcast almanac/ephemeris data after importing constellation from Rinex file.	505295	
	Vehicle description file is not updated	513639	
	Wrong alignment of PPS marker	623257	
	GLONASS Pseudo ranges 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
	GLONASS Pseudoranges have inacuracy of up to 30 cm.	499045
	Lower HIL rates cause sometimes unexpected position error.	563110
K502 Wideband Ext. Seq		
	Selection of a large PDW file in Direction Finding Mode took a long time	619284
K503 Realtime Ctrl. I/F		
	K503/K504: Fixed Bug where the system time info in the statistics tab was not set to zero after arming the baseband, but it ran to a subsecond number. This leads to dropping of PDWs if their TOA is lower than this value.	601748
	K503/K504: The socket was closed when changing the trigger settings. We also added a muting functionality for the external trigger, to be able to synchronize to an external 1pps signal by simply unmuting the external trigger before the next 1pps.	609529

Known Issues		
ARB Waveforms are limited to 512MSamples		458971
BBin: Interface HS DIG I/Q, samplerate might be incorrectly rounded		627442
Due to rounding errors in 32 Bit Linux SW, the max AM Depth 1/2 values are limited to values which are 0.01% smaller than specified one, in case that the both AM states are ON.		600789
Fading with 2xSISO: Restarting fading on one path also restarts fading on the other path.		418298
K544: In some rare cases while compensating frequency responses with high dynamic ranges (> 15 dB) and using ALC setting Sample & Hold, the absolute level compensation may have an additional level error.		380795
Possible firmware freeze when recalling a settings file where instrument graphics were active during save.		565858
Pulse generator external gated mode: Pulse delay applies delay to both pulse out and sync signal.		455775
SMW-B10: Phase offset in stream mapper only applied when triggering the baseband.		465334
SMW-K78: wrong radar equation calculation for Moving object		611765
SMW-K80: no signal output for BER TestGen Data and BER TestGen Clock.		451583
SMW-K810: with high phase noise levels output signal is disturbed.		653908
Wideband SMW, GSM: level at slot 8 for levatt 7 value is wrong		334932
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
	If start time is just before leap second insertion, the insertion might be omitted.	408616
	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
	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

	Discontinuities in trajectory sometimes when loading large .kml File	521548

Radar Echo Generation		
	After changes on analyzer, latency is not reduced to minimum. Workaround: turn BB Input off and on again	213415
	For 24 Moving Objects with different velocity after some minutes DSP-Error 0x8004 is observed	183034
	For 2xK78 and addition of both streams in Stream Mapper: automatic level calculation not working correctly in all cases	183053
	For Moving Object with Start-Range > End-Range, Level might be clipped. Workaround: turn object off and on again	183039
	For signal routing BBin to REG A+B and Stream A mapped to RF B in Stream Mapper, signal generation not working in all cases	226737
	For signal routing to both REGs and addition in Stream Mapper, Automatic System Latency measurement not working in all cases	252364

K502 Wideband Ext. Seq		
	Loading of large PDW files took a long time.	620481

2 Modifications to the documentation

The current documentation is up-to-date.

3 Firmware update

3.1 Downgrade

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

► Start System Config / Setup / Instrument Assembly / Versions/Options
► In the tab "Firmware", you find the Downgrade Info

		Downgrade Info
Package	Version	
Factory Version	4.80.041.48	
Min. Version	03.01.009.16	

Example

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

3.2 Update Information

The update procedure requires that the instrument is operational. There is no need to uninstall the current firmware. Instrument settings are preserved during the update, including user data and network settings.

NOTICE

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

3.3 Updating the Firmware

Required equipment

Software:

Firmware update file SMW_<version-number>.rsu

Hardware:

USB memory stick with enough free space to save the update file
(about 900 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®SMW200A

► 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 PRESET on the instrument front panel.

Press SETUP "Adjust All". internal instrument adjustments and will take several minutes.

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

3.4 Alternative update procedures

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

3.4.1 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 SMW_<version-number>.rsu to directory update
► The update procedure starts immediately
► Execute internal adjustments, if indicated

3.4.2 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 SMW_<version-number>.iso
Please contact the service department to get this file!

Hardware:

► External USB CD or DVD ROM burner with USB cable.
► 1 CD Recordable.
► PC with burn program that can burn ISO images onto CD.

About ISO image

This is a standardized file format for creating CD images. A CD image is a single file encapsulating the whole data of a CD including directories and files. Unpacking the image to a CD restores the original data. Almost any CD burning program is able to write CDs based on ISO images.

Update procedure

Burn ISO image onto 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 SMW_<version-number>.iso
► Click "Burn"
► When finished, close Nero and disconnect external USB CD/DVD drive

Install new firmware on R&S®SMW200A

► Instrument must be switched off
► Connect the external USB CD/DVD drive to the R&S®SMW200A
► 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

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:

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