R&S®WMS32

Release Notes
Software Version V10.60.20

Muehldorfstr. 15, 81671 Munich, Germany
Phone: +49 89 41 29 - 0
Fax: +49 89 41 29 12 - 164
E-mail: mailto:info@rohde-schwarz.com
Internet: http://www.rohde-schwarz.com

The software makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" on the user documentation CD-ROM (included in delivery).
is abbreviated as R&S

Test & Measurement
Release Notes
PAD-T-M: 3574.3288.02/02.00/CI/1/EN

ROHDE&SCHWARZ

Contents

1 Information on the Current Version

1.1 General

Function

ATTENTION:

In order to be compliant with normative requirements of the newest standard versions OSP-B157W8 is required.

This new software version (V10.50 or newer) does Adaptivity test cases (ETSI EN 300 328) and DFS test cases (FCC & ETSI) only with OSP-B157W8.

Unfortunately, TS8997 cannot support OSP-B157 (4 port) any longer.

Please contact your sales engineer for trade-in offers.

ETSI Adaptivity:

It is necessary to upload new waveform files to the vector generator. To do so:

Go to "Device List" -> used vector generator -> "Properties" -> "File Upload" deselect "Force overwriting existing files on device" and press "Upload TS8997 Waveform Files"

1.2 Firmware Version OSP / FSV / ESR / FSW

Precondition

All tests:

* The OSP-B157W8 needs firmware version 1.27 or newer
* The spectrum analyzer FSV needs firmware version 3.40 or newer
* The spectrum analyzer ESR needs firmware version 3.46 or newer
* The spectrum analyzer FSW needs firmware version 4.21 or newer

1.3 Version 10.60.20

No changes.

2 Software Update

2.1 Updating the Software

Download and expand the “EMC_AMS_WMS32_10V60_20.zip” file (requires password for unzip and is encrypted with WinZip 2.0 method) into a temporary folder on your hard drive.

Run the “Setup.exe” program in order to update your WMS32 installation to V10.60.20.

3 Version History

3.1 Version 10.60.10

New Functionality

Modified Functionality

Improvements
General: - Improved export procedure for reports including many graphics (i.e. more than 100). - Time-limited demo license (WMS32-K0) now enables all WMS32 options.
Hardware Support: - Issue in hardware setup of OSP-B157WX resolved when selecting paths. - Improved support of OSP-B157W8PLUS. - Improved support of FSV3000 / FSVA3000 series.
ETSI EN 300 328: - Maximum COT Limit corrected for DUTs with adaptive frequency hopping using other forms of DAA (non-LBT based).
ETSI EN 300 328 (V2.2.2): - Higher priority of occupied bandwidth measurement (result required for receiver blocking test).
ETSI EN 301 893 (DFS): - Required PRI corrected in table (PRI value changed from 700 µs to 1428 µs).

3.2 Version 10.60

New Functionality
New option WMS32-K222 / SWS-3002202: New standard EN 300 220-2 V3.2.1 implemented
WMSSpectrumAnalyzer: FSV3000 added
New standard EN 300 328 V2.2.2 implemented, active SWS-300328 required

Modified Functionality
All DFS tests: Video trace graphics shown in test and report are now from OSP-B157W8 instead of analyzer. Now graphics show base data of evaluation.

Improvements
FCC §15.247: - Output Power gain was in the RMS value included if a OSP-B157W8 was used
ETSI EN 300 328: - Adaptivity was missing Signal Generator setting in the report

Improvements
- DUT Configuration sets default value of Tx sequence and tx gap value according to standard
DUT Configuration: - Predefined frequency channel list are always shown regardless of modulation type
ETSI EN 301 893: - DFS RDT probability in range 5600 MHz to 5650 MHz set to 99.99%
GUI: - Standard and version selection in DUT config separated. - DUT config extended: New fields for extreme conditions (voltage, temperature and humidity)

3.3 Version 10.58

New Functionality
New option WMS32-K502 / SWS-302502: New standard EN 302 502 V2.1.3 implemented

Modified Functionality
General improvements in GUI / Usability in Template and DUT configuration

Improvements
ETSI EN 301 893: * DUT Info / Adaptivity: Parameters for priority class 1 & 2 now have "Note 1" / "Note 2" extension. Max COT time now limited depending on priority class. * Carrier frequency with "unmodulated" bandwidth: Bugfix for Resolution Bandwidth determination and power calculation. * Adaptivity: Consider "Note 1" and "Note 2" without need to change Channel Occupancy Time.
FCC §15.247: * Restricted Band for 2.4GHz: Measurement is done up to 26GHz. * Tx Spurious: Much faster measurement, final sweep with trace mode "Average Linear" and "Sample detector"
Online-Help: * List of WMS32 options for standard updates added / small typo corrections.
All tests with companion: * Attenuation of cable "Companion to OSP" is now considered correctly. * Saved Test: File name of attenuation cable "Companion to OSP" now with correct spelling. * Fixed attenuation of cables are now saved in test.
WMS Spectrum Analyzer: * timeout criteria changed

3.4 Version 10.50.10

Modified Functionality
ETSI EN 301 893 - DUT Info / Adaptivity: Parameters for priority class 1 & 2 now have "Note 1" / "Note 2" extension. - Max COT time now limited depending on selected priority class
FCC §15.247 - Restricted Band for 2.4GHz: Measurement will be done up to 26GHz.

Modified Functionality
All tests with companion - Saved Test: File name of attenuation cable "Companion to OSP" now with correct designation - Fixed attenuation of cables are now saved in test.
ETSI EN 301 893 - Carrier frequency with "unmodulated" bandwidth: Fix for Resolution Bandwidth recognition and power calculation
WMS Spectrum Analyzer - timeout criteria changed
FCC 15.407 - Spurious emission measurement improvement: Limits below 1GHz adapted
ETSI DFS In-Service-Monitoring - Radar signal offset in expert mode (K9 option) now considered correctly
All test using vector generators - Limit set to 30dBm at any device reset
All video calibrations - More log expressions in right pane

Improvements
FCC §15.247 - Tx Spurious: Much faster measurement, final sweep with trace mode "Average Linear" and "Sample detector"
Online-Help - List of WMS32 options for standard updates added / small typo corrections
All tests with companion - Attenuation of cable "Companion to OSP" is now considered correctly

3.5 Version 10.50

New Functionality
FCC §15.407: - New Option WMS32-F5U3 for changes for 2018. This new option refers to the following document: * KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
FCC §15.247: - New Option WMS32-F2U2 for changes for 2018. This new option refers to the following documents: * ANSI C63.10-2013 * KDB 558074 D01 15.247 Meas Guidance v05
FCC §15.407 and FCC §15.247: - New option WMS32-K14 for the two new test cases Emissions in restricted frequency bands (Average) and Emissions in restricted frequency bands (Peak) This new option refers to the following documents: * ANSI C63.10-2013 * KDB 558074 D01 15.247 Meas Guidance v05 Restricted bands definitions are from document: * §15.35 Limits are calculated according to: * §15.209 using KDB Publication 412172 * §15.35

Modified Functionality

ETSI EN 301 893 DFS In Service Monitoring:

- Test fail if Duty Cycle is below limit. Default for the limit is 30% according to standard. Expert mode can change the limit.
- Warning if limit is exceeded by more than 10%. No impact on test and report. This warning helps to find a suitable Duty Cycle
- No wait for startup time
- Action "Power cycle DUT (Used only, if ....)" obsolete replaced by action "DUT re-configuration to normal operation (Used only, if ...)"

FCC DFS Channel Availability Check:

- Measurement accuracy of radar pulse verification improved

ETSI & FCC DFS:

- Calculation of threshold for trace evaluation now based on noise level measurement instead of DUT configuration parameters.
- Expert mode: User can change calculation of radar signal power and threshold for trace evaluation.
- Expert mode: An additional user defined waveform with name "MyARB.wv" can be selected in test setup. Precondition is to upload the new waveform files as mentioned above in paragraph general. User can then upload his waveform file to new directory "USERWV_TS8997".

Improvements

General

-Graphs for each used gain table will be shown in the report

ETSI EN 300 328 & ETSI EN 301 893

- Beamforming gain uses now a gain table instead of the single value

FCC §15.407 and FCC §15.247

- Directional gain added to the WMS DUT Configuration. Will be used for power and PSD limit calculation. Directional gain need to be calculated according to KDB662911 D01 F) 2) and has to include all antenna gains.
- Beamforming gain removed

ETSI EN 300 328

- Adaptivity: Measurement changed to waveform files for the interferer signal for compatibility to new vector generators. Measurement procedure changed to one long measurement which includes the interferer and the blocker with high time resolution, which is only functional with OSP-B157W8, instead of separate measurements. To upload the new waveform files: "Device List" -> used vector generator -> "Properties" -> "File Upload" deselect "Force overwriting existing files on device" and press "Upload TS8997 Waveform Files"

FCC §15.247

- Time of Channel Occupancy: Measurement procedure changed to sample the video output of the spectrum analyzer and the power meter at the same time with high time resolution, which is only functional with OSP-B157W8

ETSI EN 300 328

- RF Output Power Report: Tx-sequence time and min. Tx-gap time are now reported correctly for OSP-B157W8
- RF Output Power: Fail of Medium Utilization Factor (MU) limit now leads to test fail
- Adaptivity: Monitoring offset for FHSS LBT (Listen Before Talk) devices corrected
- Hopping Frequency Separation: Video bandwidth now 3 times the resolution bandwidth

ETSI 301 893

- Adaptivity: Test for maximum of 50 transmissions during 50ms.
- Adaptivity Report: Now all percentage values are additionally shown as time

ETSI EN 300 328 & ETSI EN 301 893

- Adaptivity: Improved trigger control for vector generator
- Adaptivity COT/Idle time measurement: Testing non hopper devices does no longer use video port burstsearch of OSP

Improvements
FCC §15.247 - Emission Bandwidth 20dB: Resolution bandwidth now 1% of DUT bandwidth - Occupied Channel Bandwidth 99%: Now available for FCC 15.247 - Peak Power Measurement (sweep & zero span): For FHSS device resolution bandwidth > emission bandwidth 20dB, for DTS devices resolution bandwidth > emission bandwidth 6dB
FCC §15.407 - Emission Bandwidth 26dB: Resolution bandwidth now 1% of DUT bandwidth
FCC §15.247 & §15.407 - Spurious / Band Edge (including straddle channels): Limits of measurements & measurements settings revised - Spurious measurements: Consider minimum antenna gain (2dBi) outside of band for measurements
FCC & ETSI Spurious, Band Edge and In Band - Gain and Attenuation Graphs added
FCC DFS - Changes in report for OSP-B157W8: Radar measurement uncertainties for radar pulse verification added / Measured max. PRI (Pulse Repetition Interval) now properly reported - U-NII Detection Bandwidth: New Checkbox "Allow Test Repetitions" for repeating any given burst during the UNII Detection test case - Statistical Performance Check Report: More details for radar type 5
ETSI 301 893 DFS - Enabled CAC test for slave with radar detection - Channel shutdown: Prevent wrong error messages (too many bursts found) in case of wrong abort criterion
FCC & ETSI DFS - Test speed-up by removing unnecessary waiting time - Improved attenuation calculation for DUT configuration "Slave without radar detection".
Any test - New variable for setting an automatic reference level in spectrum analyzer for fixed attenuation setting. - SMB100B and SMBV100B supported as signal generator in WMS HW Setup and wizard
Device Driver - Check Device dialog for ERM Unit (OSP-B157W8) now possible to read out all available attenuation data
ETSI EN 300 328 & EN 301 893 - Tx and Rx Spurious: Fix for Final Measurement Calculation Overflow

3.6 Version 10.40.10

Modified Functionality
EN 300 328 & EN 301 893 Receiver Blocking: New action added: 'Before initial blocking generator activation'. Action is executed after the Leveling for P_min is completed. Could be used to reestablish connection in case of lost connection during performance criteria check.
General: Reset of Spectrum Analyzer will be performed after each test case
EN 300 328 Adaptivity: Information about total bandwidth > 150% of system bandwidth of the vector generator's AWGN signal added in the report/GUI.
Adaptivity: The interferer level of the vector generator now is increased by the uncertainty compensation for vector generator and signal paths.
OSP-B157W8 device driver now checks for identification type of the device
Typo in WMS variable 'Longest Burst Time[s]' corrected
EN 300 328 Adaptivity: Changed RBW of the Spectrum analyzer from NBW / 2 to NBW / 3
CMW: Now it is possible to set it physical if only KS611 option and no KS600 and no KS610 option is

Modified Functionality
present. PER measurement with EUT Monitoring for Bluetooth LE measurement direct testmode with options KS611 and KS721 reads now the correct value

Improvements
Frequency axis of some OSP-B157W8 path calibration data wrongly calculated due to different start frequencies. Test results not influenced.
Interpolation problem for DUT antenna gain tables for non linear gain tables solved. Interpolation will be done properly now.
Solved: EN 300 328 Hopping Frequency Separation showed the same frequency for both channels in the GUI. Report was not influenced.
EN 301 893 PSD: Fixed: If DUT Frequency was in sub-band 2 and frequency was < 5500 MHz the measurement was done in sub-band 1.
EN 301 893 PSD: error on reopening a completed test with more than 1 DUT ports and measurement option 1
EN 301 893 / EN 300 328 PSD: Fixed: WMS32 shows an error if a DUT with 8 ports was measured with option 1
EN 301 893 / EN 300 328 PSD: Fixed: Summation of PSD for measurement option 'constant DutyCycle' and more than one DUT port was not correct.
EN 301 893 / EN 300 328 PSD: Sweepcount increased and sweeppoints formula changed
Rx/Tx Spurious measurement without OSP157(W8) [direct connection]: Fixed: In some cases reference level of the spectrum analyzer was not calculated correctly.
EN 301 893 / EN 300 328 Rx/Tx Spurious: Fixed: Summation of the final measurement burst values with more than one DUT port was not correct.
EN 301 893 In Band (unwanted emissions within the bands): Spectrumanalyzer settings changed: RBW 1 MHz, sweeptime increased, sweeppoints adapted
EN 301 893 RF output power: results for measurement option 1 showed results for measurement option 2 in the GUI. Report was not affected.
WMS Spectrum Analyzer: Fixed: If GPIB was used some commands are sometimes not executed correctly. In case of problems: Change to VISA in the device list with GPIB VISA Device Identifier e.g. GPIB0::20::INSTR
FCC DFS CAC radar signal verification: Fixed: Signals could not be evaluated for high radar signal levels with OSP-B157W8
FCC DFS CAC: Fixed: Informative timing diagram in test settings dialog showed wrong timing
EMC32-K10A: Detection of the EUT signal bursts during final measurement improved (additional setting in TS8997 receiver driver).
Actions in DUT config: "Before specific Actions" and "After specific Actions" now work for "Program a Device" actions

3.7 Version 10.40

New Functionality
Added support for FSVA as WMS Spectrum Analyzer
EN300328 V2.1.1 & EN301893 V2.1.1: Possibility to select vector generator instead of generator for blocking signal at Receiver Blocking test
Added support for Generator SMA100B
EMC32-K10A: Start- und stop-times of bursts added to the final result table of the report Out of Band Tx & Rx Spurious Measurements: Tables with start- und stop-times of bursts added to the test
Action "Program a Device": CMW parameters partially set by test if configured in action
WMS32 test: Add path attenuations to "Actual Connection" graphics
Add reference check for WMS Template for path deletion in device list
Add WMS32 application version to WMS32 log
Add name of power, frequency, bandwidth to action engine variables

New Functionality
Possible to select a path with reduced attenuation for COMP to DUT4 with OSP-B157W8
EUT Monitoring with CMW Bluetooth: NAK measurement added

Modified Functionality
OSP-B157 Power Meter removed from selection list of "TS8997 Receiver"
WMS Wizard now issues a warning if coping of OSP-B157WX attenuation files goes wrong
EN300328 & EN301893: Trigger time for Out of Band, Tx spurious, Rx spurious changed
Adaptivity EN300328 and EN301893: Error message improved if vector generator couldn't load the waveform correctly.
CMW Bluetooth & WLAN: Maximum output level removed - settings are verified before sending them to the device
CMW WLAN: Actions in 5 GHz band now work with 40MHz and 80MHz channel bandwidth
Vector Generator: Waveform upload now possible without option SMx-K6/SMx-K350
EN301893: In Band (unwanted emissions within the bands) changed port selection to better suit the standard

Improvements
On some vector generator configurations, no trigger pulse was created for some waveforms
WMS Template: Click on the report button raises an application error on some MS Windows 10 systems
ERM Unit driver recognize unexpected overranges for some MS Windows Region and Language settings
Tx Spurious Emission FCC Part 47 §15.247: Limit Line changed due to measurement bandwidth correction
Generator/Vector Generator attenuation values are only read if they are in use with OSP-B157W8
Adaptivity EN300328 with OSP-B157W: If internal attenuation was switched during the test, the attenuation variables for formulas are now recalculated
EN301893 V2.1.1 Receiver Blocking: For blocking frequencies <5150 MHz and >5725 MHz antenna gain was erroneous set to 0dBi
EN301893 V2.1.1 Receiver Blocking: Not all measurement values were loaded if a saved test was reopened
EN300328 Receiver Blocking: Corrected levelling for Pmin levels
EN301893 V2.1.1: Limits in histogram for Adaptivity corrected
EN300328: COT Information in DUT configuration now invisible
Simulation of Accumulated Transmit Time, Frequency Occupation, Time of Channel Occupancy works now
Receiver Blocking with OSP-B157W8 does levelling of attenuation in simulation
If no connector is selected in the WMS template a message now shows a correct warning
Bluetooth channel list in the DUT Configuration now starts at 1 instead of 0
Reference Level of Analyzer increased during Adaptivity Test
EN 301 893 V 2.1.1: Q Factor is hidden in DUT Configuration
FCC 15.407 Spurious Emission: Syntax in limit formula corrected
Hopping frequency separation does no longer show simulation label if test reopened and DUT was in test mode
Hopping sequence does now save changed limit settings
Power Measurement with 0% duty cycle does not show any failures
SMBV100A: Waveform now set immediately on all firmware versions
EN301893 V2.1.1: Configuration file now works on all Windows Region and Language settings
EN301893 V2.1.1 Receiver Blocking: Advanced settings can be saved now
Waveform directory selection now works on MS Windows-based vector generators SMU200A and SMJ100A
Receiver Blocking: Correction for attenuation switching in action engine.
FCC 15.407: Power limits corrected

3.8 Version 10.38

New Functionality
New Option WMS32-F2U1 and WMS32-F5U2: Upgrade for FCC part 47 §15.407 2017 and FCC part 47 §15.247 2017. The following DUT Configurations have been added: * FCC 15.407 DFS only V2017 * FCC 15.407 V2017 * FCC Part 47 §15.247 2400-2483,5 MHz V2017 * FCC Part 47 §15.247 5725-5850 MHz V2017

Modified Functionality
Support for CMW: Better support for attenuation at Receiver Blocking test.
DFS Channel availability Check (CAC): Maximum wait time for startup time measurement extended from 240 seconds to 360 seconds
CMW500-BT driver * The driver now sends the "DETach" command instead of "StopTestMode" for reverting connection state to STANDBY.
DFS Measurements * FCC & ETSI DFS Test: Fix for wrong display of simulation label after re-opening a test. * ETSI DFS Test: Fix for non-identification of transmission of DUT. * DFS CAC: Video trigger threshold of automatic startup time measurement adjusted.
DFS tests for EN301893: PSD of DUT adjustable in WMS32 Test Template
HWS: Calibration setups for OSP-B157WX can get generated from WMS32-HWS
Inband Measurement (EN301893): Analyzer settings now in report
Adaptivity-Tests: Pre-measurement to determine the optimal threshold level.
DFS CAC measurements for ETSI and FCC: Better adjustment of "Injected Radar Burst" inside the designated time slot.
DFS FCC detection bandwidth test: Added spectrum analyzer hardcopy for each frequency step

Improvements
Device Driver for Vector Generators, SMU200A: * Fixed: Could not access HDD of device, update of waveform files not possible via SCPI.
Additional tool " iKey MergeTool.exe": Extension of expired SWS now possible with option code
'Accumulated Transmit Time' and 'Frequency Occupation' Fixed: Video trace values didn't consider attenuation if HiRes-Mode is configured and OSP-B157W8 is used (HiRes-Mode measurement result may differ from Analyzer measurement result)
Fixed: WMS Variables replacement of "Program to be run" in "Remote Action" was not working properly
Device Driver for SMB100A: * Fixed: Loading improper options for 20/40GHz
DFS Measurements * 'Accumulated Transmit Time' and 'Frequency Occupation' Fixed: Inaccurate threshold calculation if OSP-B157W8 and HiRes-Mode is configured (HiRes-Mode measurement result may differ from Analyzer measurement result)
DUT Configuration * Fixed: Could not save new/changed DUT configuration (type mismatch fault)

3.9 Version 10.30.00

New Functionality
New option WMS32-E5U1: Upgrade for ETSI EN 301 893 V2.1.1 with Receiver Blocking Test added
New device group "ERMUnit" with device OSP-B157W
Support of OSP-B157W in all WMS32 test cases
Wizard for WMS initial configuration added
New adaptivity ARB waveform files (OFDM, AWGN, LTE) for vector generators added (need to be uploaded, open vector generator configuration in device list -> Properties -> File Upload -> "Upload TS8997 Waveform Files")
EN 301 893 DFS: Added new additional channel shutdown test without non-occupancy period measurement
FCC 15.247: Added peak power measurement with analyzer in sweep mode

Modified Functionality
Recalculated DFS ARB waveform files for improved trigger handling, (need to be uploaded)
External trigger input threshold of analyzer / receiver changed to 1V
Changed timeout of WMS spectrum analyzers for large sweep counts
DFS: Reference to actual ETSI Standard version in the report
Complete set of parameters are sent to vector generator. This prevents wrong settings due to manual setting of generator.
Remote Action: Test-variables are now available in "Program to be run".
FCC PSD: Two stage measurement available. If the first (faster) measurement fails, the measurement will be repeated with different analyzer settings.
New variables for formulas: General: "IsHighest" frequency and "IsLowest" frequency (of sub band) ETSI EN 300 328: Minimum & maximum number of channels and blacklisted channels ETSI EN 301 893 V2.1.1: Priority class and supervising device 15.407: Measured power spectral density, 26 dB and 99% bandwidth 15.247: Measured AVG power spectral density and 6dB bandwidth
WMS32-K84: Captions for graphs added

Improvements

General:

Function
Improved stability of the hard copy function for the report
OSP-B157 power meter: Issue in language dependent date check of calendar data solved
Issue with iKey option dates and different region settings in MS Windows solved.
Issue with WMS DUT configuration version check and different region settings in MS Windows solved
Vector Generator waveform upload: Only available for WMS32 application.
Solved: WMS DUT configuration action engine for frequency has been changed for hopping mode and test mode if "different per frequency" is selected.
Solved: If no Connector was set in the template an error appeared in the test
"blacklist number of hopping frequencies" renamed to "minimum number of hopping frequencies" in report
Solved: DUT configuration modulation was set to FHSS for standards where the flag cannot be selected in the GUI.
Solved: Pressing stop during an analyzer sweep could lead to a "not triggered" error instead of leaving the

Function
test and reset it.
Solved: Peak Power Spectral Density test was not copied correctly.
Solved: System verification "AWGN Power Spectral Density" limits were not saved/loaded
Solved: Due to special path names, WMS could not create calibration setups in hardware setup.
Solved: WMS indicated an error if user selected a word report and WMS32-K84 option was available.
Solved: Some spectrum analyzers were adding sweep points internally, the frequency of those traces was shifted by 1/2 trace point.

For ETSI EN 300 328 and EN 301 893:

Function
DFS in service monitoring: If test is aborted WMS32 shows correct simulation state on UI
DFS: More stable waiting functionality using new date save timer (midnight problem)
EN 300 328 2.1.1 receiver blocking: Receiver category 3 now uses the correct action
Solved: Adaptivity: Issue with report generation for repeated tests with DUT having 0 % duty cycle in the evaluation window while the first measurement had a DC > 0 %.
Solved: In some cases Tx/Rx Spurious, Inband, Band Edge Low and Band Edge High was set to pass without test results if WMS could not read the trace from the analyzer. Report could not be created with this aborted test.
EN 301 893 InBand: Added missing report tables
Solved: EN 300 328 power measurement: Issue with overall test result if only tx-seq failed.
Solved: DFS ISM Wrong label 'simulation' at analyzer settings, if test stops due to failed DUT in PreTest.
Solved: ETSI EN 300328 PSD: Checkbox "Keep measurement for each connector in the graph" was shown wrong for option 1 and option 2
Solved: ETSI EN 300 328 Hopping Sequence: Frequency span value of band allocation was also shown in percent.

For FCC §15.247 and §15.407:

Function
DFS statistical performance check: Length of limit line in graphs revised
DFS in service monitoring: If test is aborted WMS32 shows correct simulation state on UI
DFS: Reference to actual KDB version in report of 2015 and 2016 standard
DFS: More stable waiting functionality using new date save timer (midnight problem)
DFS: WMS32 now uses power spectral density value for threshold calculation instead of EIRP.
Solved: DFS ISM Wrong label 'simulation' at analyzer settings, if test stops due to failed DUT in PreTest.
Solved: Adaptivity: Issue with report generation for repeated tests with DUT having 0 % duty cycle in the evaluation window while the first measurement had a DC > 0 %.
Solved: In some cases Tx/Rx Spurious, Inband, Band Edge Low and Band Edge High was set to pass without test results if WMS could not read the trace from the analyzer. Report could not be created with this aborted test.
Solved: Peak Power Spectral Density test was not copied correctly.
Solved: System verification "AWGN Power Spectral Density" limits were not saved/loaded
Solved: Due to special path names, WMS could not create calibration setups in hardware setup.

3.10 Version 10.20.01

New Functionality

Function
New Option WMS32-E2U1: upgrade for ETSI EN 300 328 V2.1.1 added (Receiver Blocking Test) Receiver Categories implemented with automated recognition EUT Monitoring active for WMS32. Could be used in the Receiver blocking test of EN 300 328 V2.1.1. Full automated leveling and performance check with CMW500/CMW270/CMU/CBT

Modified Functionality

Function
Spectrum analyzer setting Preamp added for spurious measurements.
Default of High Definition Mode is now off for Accumulated Transmit Time, Frequency Occupation and Time of Channel Occupancy.
Power Spectral Density according to EN 300 328 V2.1.1 got an additional measurement method.
Test Case description for EN 300 328 added to test report

Improvements

Function
In some cases the different path in Spurious and Band Edge measurement was not set to "<default>".
EN301893 PSD in the Analyzer Settings the Name of Option 1 and Option 2 was reversed.
The number of transmit chains were not changed in the General Tab of the DUT Configuration if a standard was changed.
In Action "Before connector change" for Tx/Rx Spuriousemission in some cases the wrong variable %DUTCONNECTOR% and %OSPCONNECTOR% was set.
Enables test 'DFS In-Service monitoring' for FCC 15.407 requirements 'Channel Closing Transmission Time' and 'Channel Move Time' acc. to 905462 D02 UNII DFS Compliance Procedures New Rules v01r02
Fixes switch to physical problem with vector generator drivers
Enables Hopping for Bluetooth with CMW500 driver for actions
Problem with overload recognition for SA FSW and EMI receivers corrected.
In some cases, changes for the spectrum analyzer settings were not stored correctly. This issue did not affect formulas.
Spurious measurements ref level and attenuation optimized
Memory management for DFS tests improved
Fixes trigger problem with vector generator on some waveforms

Known Issues

Function
Report size is still limited, user information shows up in case of reaching the Hardcopy/Graph limit. WMS32-K84 Office Report should be used instead.

3.11 Version 10.10.02

Modified Functionality

Function
DUT Configuration: List of Stadards are sorted now.
DUT Configuration: List of used frequencies and list of used bandwidths are sorted now.
DUT Configuration: Drag and Drop of needed frequencies and bandwidths are now possible.
Reports could be "saved as" by right click context menu on the report file.
WMS32 Report: Notation of Radar signal 0 for ETSI EN 3001 893 now is "Reference"

Improvements

Function
If the word report was selected and WMS32-K84 was missing a report was created without a path to save, which lead to error messages of the file handling.
Switches in the selected DUT Path were not set correctly
WMS Spectrum Analyzer FSQ 40 was not able to set to physical. (SA FSQ 40 must be now selected instead of SA FSQ40)
Problem if an Action was added to the start or stop of an WMS sequence soved
WMS32-K02 ETSI EN 300 328 Tx unwanted emissions in the out-of-band domain: config file error solved
Missing Configuration files for FCC §15.407 2016, FCC 15.247 2016, System verification 1.0.0 added
Under certain circumstances the Adaptivity settings configuration Frame of Adaptivity Tab was grayed out. That is fixed now.
Checkmark of DFS capability was not visible in some cases, if standard is changed. That is fixed now.
The WMS Configuration files are now saved/added to a WMS32-Backup
FCC §15.247 Spurious limit for conducted testing includes now the reflection factor correction for <1GHz
WMS32-K05 ETSI EN 301 893 DFS channel shutdown and non-occupancy period was blocked for slave without radar detection. That is fixed now.
DUT Configuration: For Standard FCC §15.407 a default frequency list is available now.
Additional variable OBW26 available for formulas
Limits for Adaptivity corrected

Known Issues

Function
Report size is still limited, user information shows up in case. WMS32-K84 Office Report should be used instead.

3.12 Version 10.10

General

Function
Transfer of EMC 97x Options to WMS32. Contact your local sales for more information
WMS32 options are available as hard lock iKey or code license

New Functionality

Function
WMS32-MU: Automated Measurement Uncertainty calculation and reporting For all relevant test cases, the measurement uncertainty will be calculated by the system and stated in the test report. The option is valid for all installed standard specific options

Function
WMS32-RAD: Radiated measurement support The TS8997 is designed to do conducted measurements. In order to do radiated tests in a semi of fully anechoic chamber the support of positioning devices like antenna mast and turn table is needed. The option WMS32-RAD measures a radiation pattern to determine the necessary position for in band tests.
WMS32-K84 Microsoft Office Word report The option WMS32-K84 supports Office Templates to generate custom specific reports
WMS32-K02 Standard option ETSI EN 300 328 V1.9.1 The option replaces EMC32-K97, K971, K972, K975 and U970
WMS32-K05 Standard option ETSI EN 301 893 V1.8.1 The option replaces EMC32-K97, K971, K973, K975 and U976
WMS32-F5U1: DFS Measurements: Support for FCC V2016 added

Modified Functionality

Function
EMC32-K97x is transferred to WMS32-Kxx WMS32 comes with a new user interface and extended test and report abilities.
FCC DFS U-NII Detection Bandwidth: Trace evaluation changed to real channel shutdown timing.
FCC DFS Statistical performance check: Trace evaluation changed to real channel shutdown timing.
Reports could be "saved as" by right click context menu on the report file.

Improvements

Function
DFS Channel availability Check measurement for FCC. Pre pulse trace and post pulse trace combined to a single trace to prevent timing gap between sweeps.
Additional path for spurious measurement configurable by user
Additional feature for adding path uncertainties in the template user interface.

Known Issues

Function
Report size is still limited, user information shows up in case. WMS32-K84 Office Report should be used instead.

3.13 Version 10.01

New Functionality

Function
none

Modified Functionality

Function
DFS CAC Test: The final measurement for start of transmission after CAC test was removed due to it is not recommended by the standard.

Improvements

Function
DFS CAC timing optimized
DFS SPC waveform random load error fixed and sweep time for radar type 5 optimized

Known Issues

Function
Report size is still limited, user information shows up in case

3.14 Version 10.00

Since WMS32 is first release with version 10.00 all functions are new. The key features of WMS are:

- Conducted wireless testing in the 2.4GHz and 5GHz bands according to FCC §15.247 and §15.407.

- EMC32 SW structure adopted test case implementation with HW setup, test template and DUT configuration.

- Summary report over all test cases, including hardcopies and device settings

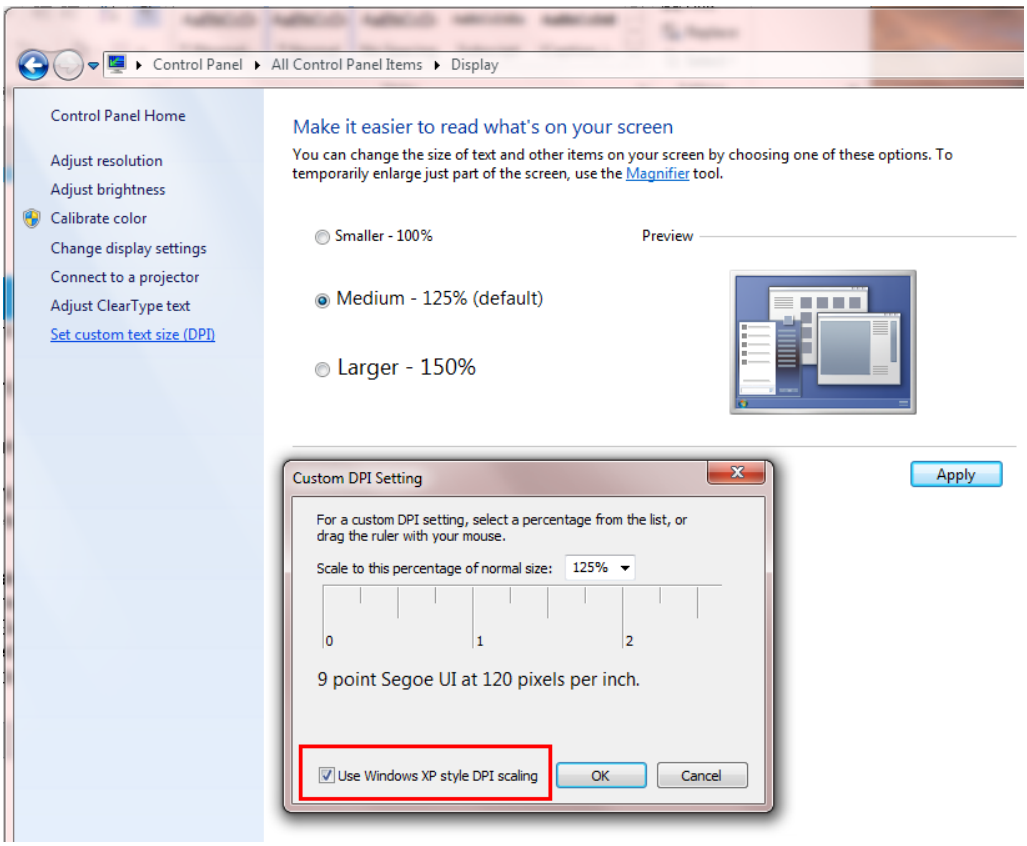
- Fully automated test run with DUT setting using the action engine.

- many configuration options for experienced users including measurement device settings and limits.

- All DFS test cases according to §15.407(h) implemented

Known Issues (EMC32 general)

Function
EMC32 Core Functions: - When using a font size scaling bigger than 100%, then Windows setting parameter "Use Windows XP style DPI scaling" (marked below in red) needs to be activated in order to guarantee a correct functioning of the dialogs.

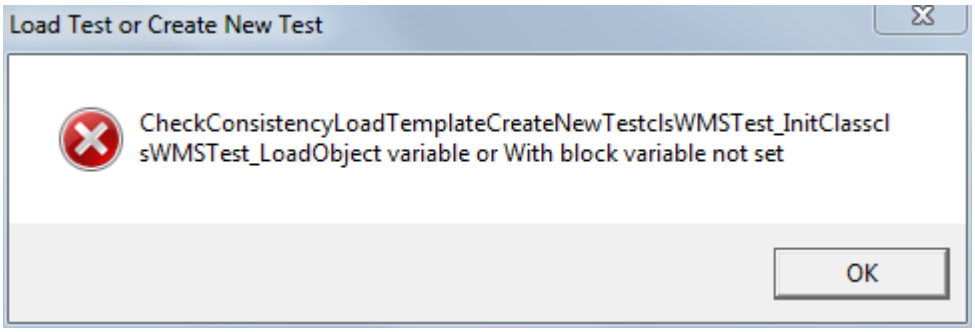


Known Issues (WMS)

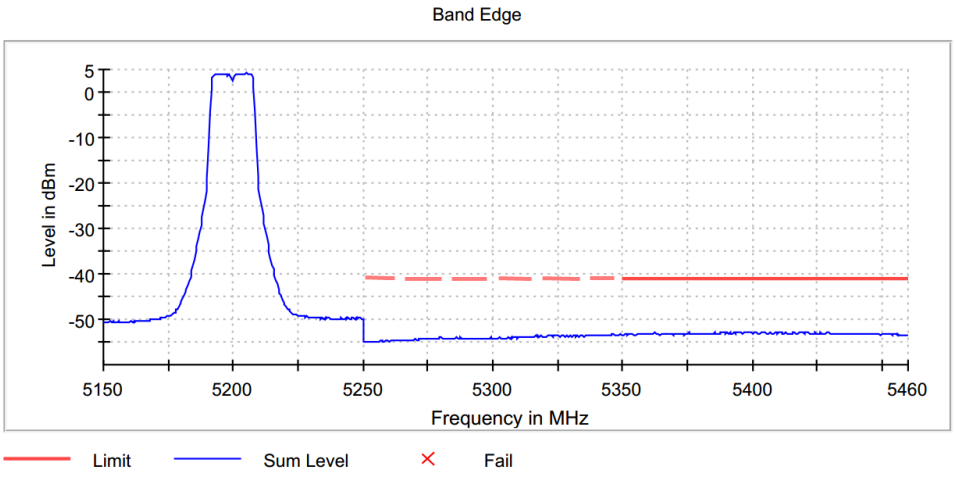
* WMS32 reports could include hardcopies and get very large depending on the number of test cases included. The pdf file creation sometimes cannot finish on large reports (>100 pages). The generate report window just stays open without error message. Excluding the hardcopies or reducing the number of test cases in one single report helps.

* Opening saved tests without the corresponding HW setup could lead to problems with displaying the test, especially with unwanted emissions tests. Also when

creating a report from such a test where the HW setup is missing, the trial to include the HW setup in the report leads to a SW crash



* The Band Edge test according to FCC §15.407 does not separate the bands 5.15 to 5.25GHz and 5.25 to 5.35GHz, so the limit may not be set in the adjacent band



* The report in html format will not include device hardcopies from R&S FSU, ESU and FSQ because these do not support jpg format

* DFS Waveform verification is implemented only in the CAC test. A separate verification test will follow in a later release.

* The summary report (EMC32-K84) is actually not working with WMS tests. The implementation will follow in a later release.

4 Customer Support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz equipment, contact one of our Customer Support Centers. A team of highly qualified engineers provides telephone support and will work with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz equipment.

Up-to-date information and upgrades

To keep your instrument up-to-date and to be informed about new application notes related to your instrument, please send an e-mail to the Customer Support Center stating your instrument and your wish. We will take care that you will get the right information.

Europe, Africa, Middle East
Phone +49 89 4129 12345
customersupport@rohde-schwarz.com

North America
Phone 1-888-TEST-RSA (1-888-837-8772)
customer.support@rsa.rohde-schwarz.com

Latin America
Phone +1-410-910-7988
customersupport.la@rohde-schwarz.com

Asia/Pacific
Phone +65 65 13 04 88
customersupport.asia@rohde-schwarz.com

China
Phone +86-800-810-8828 / +86-400-650-5896
customersupport.china@rohde-schwarz.com