R&S®ELEKTRA
EMC TEST SOFTWARE

Specifications

Data Sheet
Version 13.00

ROHDE & SCHWARZ

Make ideas real

CONTENTS

Software version

The following specifications are valid for software version 05.00.

User interface languages

The following user interface languages are supported: English, German, Chinese

Minimum system requirements

Operating system	Windows 10, 64 bit; Windows 11, 64 bit
CPU	PC with Intel® Core™ i5/i7/i9 processor (or comparable) or laptop/tablet with Intel® Core™ i7 processor (or comparable)
Free RAM	8 Gbyte
Free hard disk space	250 Gbyte hard disk, solid-state disk (SSD) recommended
Graphics resolution	1280 × 720 pixel, higher resolution or dual screen recommended
USB	2.0
LAN	100 Mbit LAN interface, Gigabit LAN recommended

R&S®ELEKTRA license dongle

R&S®EMCPC license dongle

Key features	smart card and USB 2.0 smart card reader (stick)

Base software packages

R&S®ELEMI-E essential EMI test software for conducted and radiated emissions

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)
Software features	
Measurement environment	• radiated emission in SAC, FAR, OATS, FSOATS and TEM waveguide • conducted emission with AAN, AMN, AN, LISN, CDN, CDNE, CP, CVP, ISN and VP • disturbance power with absorbing clamp
Test setup	test template including hardware setup: • one receiver can be configured with settings per test template • multiple report templates • limit lines/frequency lists/correction tables
Characterization of signal paths and transducers	manual entry of transducer correction tables (e.g. transducer factors)
Measurement sequence/test control	interactive and automatic test execution of: • spectrum overview measurement, data reduction, final measurement • manual positioning of EUT • manual positioning of antenna (polarization/height) • automated switching of LISN lines (depending on receiver used) • automated 3-axes sequence for GTEM measurements • data reduction method (subrange maxima or peak excursion) • trigger custom actions or notifications before/during/after test • device simulation mode for preparation/validation of test templates
Data storage	• integrated database • data backup and restore • import and export function for test templates, device configuration and tables
Measurement result display	• tables and configurable traces with limit lines and markers
Reporting	• single test, multiple measurement report in PDF, DOCX format
User interface	• dashboard with configurable favorite items for quick access (test templates, tests, report templates, etc.) • keyword search function, search for frequencies, tags, standards, dates • touchscreen or mouse operation

Additional tools	• unit converter tool • migration tool for test templates from R&S®ES-SCAN • GTEM waveguide correlation algorithm (convert TEM specification to correction table) • configuration wizard to import predefined test templates and commonly used data
Supported devices	
Measurement receivers and spectrum analyzers	• R&S®EPL • R&S®ESCI • R&S®ESL • R&S®ESPI • R&S®ESR • R&S®ESRP • R&S®ESU • R&S®ESW • R&S®FPC (no user port for LISN control) • R&S®FPH (no user port for LISN control) • R&S®FPL • R&S®FSL • R&S®FSV • R&S®FSV3004, R&S®FSV3007, R&S®FSV3013, R&S®FSV3030, R&S®FSV3044, R&S®FSV3050 • R&S®FSVA3004, R&S®FSVA3007, R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050 • R&S®FSW • R&S®FSWT
LISN (remote control depends on receiver model)	• R&S®AMN6500 • R&S®ENV216 • R&S®ENV432 • R&S®ENV4200 • R&S®ESH2-Z5, R&S®ESH3-Z5 • R&S®HM6050-2 (optional USB-to-COM adapter required for remote control) [1]

R&S®ELEMS-C EMS test software for conducted susceptibility

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)
Software features	
Measurement environment	conducted measurements (BCI, CDN, EM-clamp), in line with commercial standards

Test setup	• hardware setup independent from test template
	  − device list configuration
	  − multiple report templates
	  − frequency lists/correction tables
	• EUT specific grouping of test results

Characterization of signal paths, amplifiers and transducers	• calibration measurement for signal path (requires generator and power meter)
Measurement sequence/test control	• interactive (manual frequency stepping) and automatic test execution • automatic leveling of interferer signal (substitution, sensor, constant power) • device simulation mode for preparation/validation of test templates
Data storage	• integrated database • data backup and restore • import and export function for test templates, device configuration and tables
Measurement result display	• representation of data in tables and graphics with markers • open results from multiple tests for comparison
Reporting	• single test, multiple measurement report in PDF, DOCX format
EUT monitoring	• one monitoring channel • manual Go/NoGo entry by operator
User interface	• dashboard with configurable favorite items for quick access (EUTs, test templates, tests, report templates) • keyword search function, search for frequencies, tags, standards, dates • touchscreen or mouse operation
Additional tools	• unit converter tool • migration tool for test templates from R&S®EMC32 • configuration wizard to import predefined test templates and commonly used data • amplifier characterization measurement (1 dB, 2 dB, 3 dB compression point)

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[1] The discontinued R&S®HM6050-2 line impedance stabilization network is supported by the R&S®ELEKTRA EMC test software.

Supported devices	
Signal generators	• R&S®SMA100A, R&S®SMA100B, R&S®SMB100A, R&S®SMB100B, R&S®SMC100A • R&S®SME, R&S®SMR, R&S®SMT, R&S®SMF100A, R&S®SML • R&S®HMF2525, R&S®HMF2550 • R&S®SGS100A
Vector signal generators	• R&S®SMCV100A, R&S®SGT100A (both with digital modulation) • R&S®SMBV100A, R&S®SMBV100B, R&S®SMM100A, R&S®SMW200A (only analog modulations)
Power meters	R&S®NRP2, R&S®NRX using below listed RF probes: • R&S®NRP6AN, R&S®NRP18AN via LAN, USB or R&S®NRX • R&S®NRP-Z11/-Z21/-Z51/-Z56/-Z57/-Z58/-Z61/-Z81/-Z85/-Z86/-Z91/-Z92/-Z98 • R&S®NRP-Z211/-Z221 • R&S®NRPxxT(N) • R&S®NRPM3 • R&S®NRVD • R&S®NRVS • R&S®NRP8/18/33/40/50/67S(N), R&S®18/40/50P, R&S®18S-10/20/25 • R&S®NRQ6
Amplifiers	• R&S®BBA100 • R&S®BBA130 • R&S®BBA150 • R&S®BBA300 • R&S®BBL200 • Amplifier Research AR (models on request) • Bonn (models on request)
Switch units	• R&S®OSP (models: R&S®OSP120, R&S®OSP130, R&S®OSP220, R&S®OSP230, R&S®OSP320) • generic switch unit
EUT monitoring	• generic monitoring single channel (1 measurement value) • R&S®AdVISE visual inspection software
Interlock	• generic interlock

R&S®ELEMS-R EMS test software for radiated susceptibility

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)
Software features	
Measurement environment	radiated measurements in SAC, FAR, OATS, TEM waveguide, in line with commercial standards

Test setup	• hardware setup independent from test template
	   − device configuration
	   − multiple report templates
	   − frequency lists/correction tables
	 • EUT specific grouping of test results

Characterization of signal paths, amplifiers and transducers	• calibration measurement for signal path (requires generator/power meter or network analyzer) • field uniformity measurement and evaluation algorithm, in line with commercial standards
Measurement sequence/test control	• interactive (manual frequency stepping) and automatic test execution • interactive, software control of antenna mast (polarization) and turntable • automatic leveling of interferer signal (substitution, sensor, constant power) • device simulation mode preparation/validation of test templates
Data storage	• integrated database • data backup and restore • import and export function for test templates, device configuration and tables
Measurement result display	• representation of data in tables and graphics with markers • open results from multiple tests for comparison
Reporting	• single test, multiple measurement report in PDF, DOCX format
EUT monitoring	• one monitoring channel • manual Go/NoGo entry by operator
User interface	• dashboard with configurable favorite items for quick access (EUTs, test templates, tests, report templates) • keyword search function, search for frequencies, tags, standards, dates • touchscreen or mouse operation

Additional tools	• unit converter tool • migration tool for test templates from R&S®EMC32 • configuration wizard to import predefined test templates and commonly used data • amplifier characterization measurement (1 dB, 2 dB, 3 dB compression point)
Supported devices	
Signal generators	• R&S®SMA100A, R&S®SMA100B, R&S®SMB100A, R&S®SMB100B, R&S®SMC100A • R&S®SME, R&S®SMR, R&S®SMT, R&S®SMF100A, R&S®SML • R&S®HMF2525, R&S®HMF2550 • R&S®SGS100A • R&S®SMW200A
Vector signal generators	• R&S®SMCV100A, R&S®SGT100A (both with digital modulation) • R&S®SMBV100A, R&S®SMBV100B, R&S®SMM100A, R&S®SMW200A (only analog modulations)
Power meters	• R&S®NRP2, R&S®NRX using below listed RF probes • R&S®NRP6AN, R&S®NRP18AN via LAN, USB or R&S®NRX • R&S®NRP-Z11/-Z21/-Z51/-Z56/-Z57/-Z58/-Z61/-Z81/-Z85/-Z86/-Z91/-Z92/-Z98 • R&S®NRP-Z211/-Z221 • R&S®NRPxxT(N) • R&S®NRPM3 • R&S®NRVD • R&S®NRVS • R&S®NRP8/18/33/40/50/67S(N), 18/40/50P, 18S-10/20/25 • R&S®NRQ6
Field probes	• AR FL700xx (4 channels) • ETS HI6005/6006/6022/6023/6053/6105/6122/6153 probes via serial FO interface • LUMILOOP LSProbe 1.2 (4 channels) • Narda EMC-300 • Narda EP600/601/602/603/604 probes via serial FO interface • Narda NBM-550 • Raditeq Radisense 10xx/20xx (single channel/4 channels) • ETS EMCenter, EMsense • Wavecontrol SMP2 • generic field probe • combined field probe
Amplifiers	• R&S®BBA100 • R&S®BBA130 • R&S®BBA150 • R&S®BBA300 • R&S®BBL200 • Amplifier Research AR (models on request) • Bonn (models on request) • CPI TWT amplifiers
Switch units	• R&S®OSP (models: R&S®OSP120, R&S®OSP130, R&S®OSP220, R&S®OSP230, R&S®OSP320) • generic switch unit
Turntables/masts	• Frankonia devices controlled by FC06 • Innco devices controlled by CO3000, CO2000, CO1000 • Maturo devices controlled by NCD, MCU and FCU • ETS devices controlled by EMCO 2090 (+ AUX ports), ETS EMControl • R&S®ATS1800, R&S®ATS1800C • generic turntable/antenna tower
EUT monitoring	• generic monitoring single channel (1 measurement value) • R&S®AdVISE visual inspection software
Interlock	• generic interlock

Base software extensions

R&S®ELEMI-A advanced EMI test software for conducted and radiated emissions

Prerequisites	R&S®ELEMI-E
Software features	
Test setup	hardware setup independent from test template: • device list can contain multiple receivers • magnetic field strength measurements with triple loop antenna for CISPR 15 • multiple EUTs can be configured, tests are assigned to 1 active EUT • detectors selection for each frequency subrange • multiple transducers with H and V polarization can be configured
Characterization of signal paths and transducers	• calibration measurement for signal path (requires generator and power meter) • individual transducer factors for all LISN lines • horizontal and vertical polarization correction table for one antenna • multiple transducers can be configured
Measurement sequence/test control	• interactive and automatic test execution of: overview measurement, data reduction, zoom (interactive only), final measurement • interactive, software control of antenna mast (height, polarization), turntable and slidebar • switch polarization manually • combined data reduction (subrange maxima and peak excursion)
Measurement result display	• display separate graphics per subrange or accessory loop position
Data management	• import and export function for test templates, device configuration and tables
Supported devices	
Switch units	• R&S®OSP (models: R&S®OSP120, R&S®OSP130, R&S®OSP220, R&S®OSP230, R&S®OSP320) • generic switch unit
Masts and turntables controllers	• Frankonia devices controlled by FC06 • Innco devices controlled by CO3000 (incl. tilt), CO2000, CO1000 • Maturo devices controlled by NCD (incl. tilt), MCU and FCU (incl. tilt) • ETS devices controlled by EMCO 2090 (+ AUX ports), ETS EMControl • R&S®ATS1800, R&S®ATS1800C • R&S®DST positioner • R&S®RSM • R&S®RST • manual turntable • generic turntable/antenna tower
Slidebars	• Innco slidebars controlled by CO3000 (incl. tilt), CO2000, CO1000 • Maturo slidebar controlled by NCD, MCU and FCU • manual slidebar • generic slidebar

R&S®ELEMI-S EMI system test software for conducted and radiated emissions

Prerequisites	R&S®ELEMI-A and R&S®ELEMI-E
Software features	
Test setup	• EUT specific test plan definition and data management • separate results for multiple EUT operating modes

Measurement sequence/test control	• interactive and fully automated sequence of measurement steps
	  − overview measurement, data reduction, maximization, zoom, adjustment, final measurement
	  − combined zoom, adjustment and final measurements for faster test execution
	• overview measurement with stepped or continuous movement (turntable)
	• simultaneous accessory movement and spiral scan
	  − add custom frequency list to list of critical points
	  − adjustment measurement with height scan and azimuth scan chart
	  − automated zoom measurement before final measurement
	  − interactive measurement of disturbance maxima
	• automated software control of antenna mast (height, polarization), turntable and slidebar
	• full automated test flow for a subrange to reduce number of antenna changes
	• extended methods for data reduction incl. external applications
	• pause and resume test flow
	• automatic 3-axes measurement for magnetic field antennas using turntable
	• gapless measurement with R&S®ESW
	• calibration measurements using network analyzer
	• decoupling measurements of high/low voltage systems using network analyzer
	• MIL-STD-461E/F/G, RE103 and CE106 harmonics measurement on transmitters with dynamic limit lines

Data management	• use shared database with up to 5 users • user and roles management
Measurement result display	• reporting as per GMW3097 requirement • polar and height scan graphical display • save a screenshot of the receiver in the test on demand
Reporting	• summary report containing marked tests per EUT
Supported devices	
Network analyzers	• R&S®ZNA, R&S®ZNB, R&S®ZND, R&S®ZVA, R&S®ZNH, R&S®ZNL, R&S®FPC, R&S®ZNLE
I/O devices	• ADAM60xx • bmcm USB-AD, USB-PIO • NI-DAQ (A/D acquisition card)

R&S®ELEMS-S EMS system test software for conducted and/or radiated susceptibility

Prerequisites	R&S®ELEMS-C or R&S®ELEMS-R
Software features	
Test setup	• EUT specific test plan definition and data management • automatic FU measurement with scanner device or multi-channel field probe • antenna with power meter can be used as field probe • network analyzer can be used for calibration setups • harmonics measurement of interference signals • use of supported oscilloscopes and receivers/spectrum analyzers as power meters [2]
Measurement sequence/test control	• automatic execution of measurement loops for EUT position (azimuth), antenna polarization and EUT operating state • separate results tables for measurement loop combinations • automated software control of antenna mast (polarization) and turntable • spectrum analyzer/EMI receiver can be used as frequency selective power meter • calibration measurements using network analyzer • digital modulation and arbitrary interference signals using a vector signal generator • automatic and interactive susceptibility mode in order to identify the NoGo interference level
Data management	• use shared database with up to 5 users • user and roles management
EUT monitoring	• multiple monitoring channel using a generic monitoring driver with automatic evaluation • manual Go/NoGo entry by operator • multiple channels with same unit can be displayed in one chart
Measurement result display	• optional worst-case analysis of each EUT monitoring channel • automated test verdict evaluation on test end • merge wizard for tables (maximum, minimum, average, custom formula) intersection or union of frequency ranges • video overlay: insertion of EMS data into visual inspection software such as R&S®AdVISE
Reporting	• summary report containing marked tests per EUT
Supported devices	
Field probe positioner	• Maturo FPP • generic field probe positioner
I/O devices	• ADAM60xx • bmcm USB-AD, USP-PIO • NI-DAQ (A/D acquisition card)
Network analyzers for calibration	R&S®ZNA, R&S®ZNB, R&S®ZND, R&S®ZVA, R&S®ZNH, R&S®ZNL, R&S®FPC

R&S®ELEMC-DRV generic drivers

Prerequisites	R&S®ELEMI-A or R&S®ELEMS-C or R&S®ELEMS-R
Software features	
Test setup	• connect to SCPI compliant instruments using a user configurable command set • import and export of command set via XML files
Device classes supported	• amplifier, RF generator, power meter • generic I/O device (only with R&S®ELEMS-S or R&S®ELEMI-S) • RF generator modulations limited to analog modulations (CW, AM, PULM)

R&S®ELEMC-REP extended reporting

Prerequisites	R&S®ELEMI-A or R&S®ELEMS-C or R&S®ELEMS-R or R&S®ELEMC-OFF9
Software features	
Reporting	• create report templates directly in Word or other compatible editors by copying XML code from R&S®ELEKTRA as a place holder into the DOTX (or compatible) file • create sub-report templates to allow adaption to measurement type • greater flexibility regarding contents and formatting when creating reports compared to the standard R&S®ELEKTRA reporting

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[2] Only with R&S®ELEMS-SCP.

R&S®ELEMS-SCP oscilloscope drivers

Prerequisites	R&S®ELEMS-C or R&S®ELEMS-R
Software features	
Test setup	• specific drivers with settings GUI for R&S®RTA, R&S®RTC, R&S®RTE, R&S®RTM, R&S®RTO, R&S®RTP • mask evaluation with R&S®RTO • usage as EUT monitoring device for EUT NoGo detection • measurement of signal parameters like level, frequency, etc. • generic oscilloscope driver for third party oscilloscopes
Device classes supported	oscilloscopes for EUT monitoring and measurement

R&S®ELEMI-3D 3D evaluation

Prerequisites	R&S®ELEMI-S, R&S®ELEMI-A and R&S®ELEMI-E or R&S®ELEMC-OFF9
Software features	
Measurement result display	• maximization data for all measured frequencies available for 3D view and 2D heatmap • cylindrical and spherical display of data • interactive change of colors scheme and viewing angle (3D view) • snapshot of display can be integrated in report • spectrum over azimuth display (for cylindrical measurements only)

R&S®ELEMI-RSE radiated spurious emission measurement

Prerequisites	R&S®ELEMI-S, R&S®ELEMI-A and R&S®ELEMI-E
Software features	
Test setup	• hardware setup test in FAR including radio communication tester and elevation positioner • calibration of receiving antenna correction factors • RSE specific results and parameters are available in the report • RF generator and TX antenna for substitution method
Measurement sequence/test control	• measurement loop for elevation • measurement loop for EUT specific parameters • substitution method as final step
Supported devices	
Turntables/masts	R&S®ATS1800C, support of tilt function of Innco and Maturo masts

R&S®ELEMI-OOB EMI out of band measurements

Prerequisites	R&S®ELEMI-RSE
Software features	
Measurement sequence/test control	TX burst trigger for RSE final measurement, in line with ETSI EN 300328, ETSI EN 301893 and ETSI 302502

R&S®ELEMI-MBM multiband measurements

Prerequisites	R&S®ELEMI-S, R&S®ELEMI-A and R&S®ELEMI-E
Software features	
Measurement sequence/test control	• measure up to 4 frequency bands (test subranges) in the overview measurement simultaneously using 4 receivers and 4 antennas to speed up EMI or RSE testing • measure H and V polarization simultaneously with 2 receivers and antennas

R&S®ELEMC-5GS 5G signaling for R&S®CMX500

Prerequisites	R&S®ELEMI-RSE or R&S®ELEMS-S
Software features	
Measurement sequence/test control	• control 5G communications signaling FR1 or FR2 link on start and end of test • check communications link during test • custom TDD slot scheduling, useful for faster RSE measurements • support for resource block assignment and modulation scheme (RMC) • TDD switching for FR2 TDD connections (only 1 remote radio head necessary) • support for VoLTE (NSA) and VoNR (SA) • support for CSWL (2G/3G/4G/ Bluetooth®/Bluetooth® LE and Wi-Fi®)
Supported device classes	
Radio communication testers	• R&S®CMX500 (two boxes with R&S®CMW500) with signaling options (FR1 and FR2) (refer to release note for required firmware version) • R&S®CMX500 one box with signaling options (FR1 and FR2)
EUT monitoring	perform 5G BLER measurement during EMS test

R&S®ELEMI-5GFC 5G RSE measurement, in line with FCC regulations

Prerequisites	R&S®ELEMI-RSE, R&S®ELEMI-3D recommended
Software features	
Measurement sequence/test control	• support of FCC 5G measurement procedure for measurement of mmWave radiated spurious emission • control of antenna positioner for measuring the full mmWave range from 40 GHz to 220 GHz fully automated • determination of the maximum radiation also for polarization +45°/+135° where 0° is horizontal and 90° is vertical • automated measurement of sphere cuts in X and Y axis layer; optional measurement of Z axis layer and calculation of TRP value • optional measurement of full TRP value over the full sphere
Supported devices classes	
Power meters	Erickson PM5
Positioner	Maturo EAP

R&S®ELEMC-WRLS EMC extension for wireless signaling

Prerequisites	R&S®ELEMI-RSE or R&S®ELEMS-S
Software features	• control communications signaling link on start and end of test • EUT monitoring (BER/PER) and EUT control for WLAN and Bluetooth® with radio communication tester during RSE/EMC tests
Supported device classes	
Radio communication testers	R&S®CMW500, R&S®CMW270

R&S®ELEMC-CELS EMC extension for cellular signaling

Prerequisites	R&S®ELEMI-RSE or R&S®ELEMS-S
Software features	• control communications signaling link on start and end of test • EUT monitoring (BER) and EUT control for 2G, 3G and LTE with radio communication tester during RSE/EMC tests
Supported device classes	
Radio communication testers	R&S®CMW500 (R&S®CMW270)

R&S®ELEMS-AMEX automotive and military EMS measurement

Prerequisites	R&S®ELEMS-C or R&S®ELEMS-R
Software features	
Test setup	• configure third TEM cell output power meter • power limitation with reference calibration table and offset • use oscilloscopes as power meters
Measurement sequence/test control	• immunity tests, in line with common automotive and military EMS standards • leveling on a transducer formula, net power, mid power • immunity level profiles including key on/off sequence • configurable modulations: CW, AM, FM, pulse, AM + pulse • pulse and pulse train modulation incl. GMW radar test • automatic loop for modulations when used with R&S®ELEMS-S • leveling with modulation on • system monitoring incl. system impedance and user evaluation formula • supports ISO 11452-8, MIL-STD-461E/F/G, RS101 magnetic field tests • supports ISO 7637-4 test pulse A with R&S®HMF2550 arbitrary function generator • power measurement based on U and I on LF tests using 2 channel scope
Supported device classes	
RF generator	• R&S®SMx pulse train option (-K27) • digital modulation with vector signal generators using ARB waveform files
EUT monitoring	R&S®EMCAN64 middleware software to interface with Vector CANoe and Vector CANalyzer software

R&S®ELEMS-RVC rotating tuner reverberation chamber measurements

Prerequisites	R&S®ELEMS-R and R&S®ELEMS-S
Software features	
Test setup	• EMS radiated setup with single tuner device (using turntable driver) • parallel usage of field probe and receiving antenna for calibration • manual field probe / receiving antenna positioning during chamber calibration
Measurement sequence/test control	• supported immunity tests according to standards EN 61000-4-21:2011 (annex B, D), ISO 11452-11:2010 with stepped tuner mode • support for unloaded/loaded chamber calibration with required measurement evaluation with defined sensor positions in the test volume • support for DUT check with comparison of loading to chamber calibration • support for DUT test with qualification or susceptibility method • parallel measurement of field strength and received power • automatic loop for modulations when used with R&S®ELEMS-S • RVC test level methods using RVC normalized max. E-field table • tuner loop with individual settings per frequency range • reporting of chamber calibration results
Supported device classes	
Turntables	• tuners controlled by turntable controller listed in R&S®ELEMI-A and R&S®ELEMS-R • COMTEST tuner based on Oriental controller

R&S®ELEMS-ABT audio breakthrough measurements

Prerequisites	R&S®ELEMI-C or R&S®ELEMS-R
Software features	• audio breakthrough calibration, in line with ETSI 301 489-52 • audio breakthrough EMS test with optional NB/BB evaluation, in line with ETSI 301 489-52 for cellular technologies such as 2G, 3G, 4G, 5G • VoNR for 5G with R&S®CMX only with external audio analyzer and R&S®CMX-ZG180A • analog audio measurement, in line with CISPR 35 using audio analyzer
Supported device classes	
Audio analyzers	• R&S®CMW500 audio board • R&S®UPP • R&S®UPV • MCD audio analyzer (without integrated PC) and toolmonitor software • Audio Precision APx517 • Standford Research SR1+

R&S®ELEMS-C345 MIL-STD-461, CS103/CS104/CS105

Prerequisites	R&S®ELEMI-C and R&S®ELEMS-AMEX
Software features	• support of MIL-STD-461E/F/G on receiver ports as per sections CS103, CS104, CS105 • support for primary, secondary and EUT stimulus generator

R&S®ELEMS-AIM EMS waveform management software for AIM 7351731 standard

Prerequisites	R&S®ELEMS-C or R&S®ELEMS-R	
Software features		

	• support for testing medical devices, in line with AIM 7351731 standard
	• waveforms provided for all parts of the AIM 7351731 standard
	  − 14223 type A (annex A)
	  − 14443-3 type A (annex B)
	  − 14443-4 type B (annex C)
	  − 15693 STAY QUIET (annex D)
	  − 18000-3 mode 3
	  − 18000-7 (annex E)
	  − 18000-63 DSB-ASK (annex F)
	  − 18000-63 PR-ASK (annex F)
	  − 18000-4 mode 1 (annex G)	

Supported device classes		

RF generators	• R&S®SMBV100A with options
	  − R&S®SMBVB-B10 or -B51 (baseband generator with ARB) and -K521
	• R&S®SMBV100B with options
	  − R&S®SMBVB-B103 (8 kHz to 3 GHz)
	• R&S®SMM100A with options
	  − R&S®SMM-B9 (baseband generator with ARB)
	• R&S®SMW200A with options
	  − R&S®SMW-B103 (frequency 100 kHz to 3 GHz)
	  − R&S®SMW-B10 (standard baseband generator)	

R&S®ELEMC-OFF9 EMC base software for offline pre/postprocessing

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)

Software features	• used for workplaces that do not connect to real instruments to perform measurements but instead are used for pre/postprocessing and data handling (import/export) tasks
	• functionality comparable with the following products (with the exception mentioned above)
	  − R&S®ELEMI-EAS, R&S®ELEMI-RSE, R&S®ELEMI-MBM, R&S®ELEMI-5GFC
	  − R&S®ELEMS-CRS, R&S®ELEMS-AMEX
	  − R&S®ELEMC-DRV, R&S®ELEMC-SCP, R&S®ELEMC-5GS
	• the following options can be added
	  − R&S®ELEMC-REP
	  − R&S®ELEMI-3D
	  − R&S®ELEMS-AIM
	  − ELEMC-DEX
	  − ELEMC-EDB

R&S®ELEMC-TLA EMC test list automation

Prerequisites	R&S®ELEMI-S or R&S®ELEMS-S
Software features	• automatic execution of selected tests within a predefined test plan • test control during measurement such as start/stop and resume • log file creation of test sequence • run custom actions before or after each test step

R&S®ELEMC-DEX data exchange interface

Prerequisites	R&S®ELEMI-A or R&S®ELEMS-R or R&S®ELEMS-C or R&S®ELEMC-OFF9
Software features	• REST API to transfer R&S®ELEKTRA report data into third-party applications • supports create, read, update, and delete operations for R&S®ELEKTRA entities

R&S®ELEMC-REM remote control interface

Prerequisites	R&S®ELEMI-A or R&S®ELEMS-C or R&S®ELEMS-R
Software features	• remote control of ELEKTRA from an external application • commands to create, start, pause, resume and save a test • fetch live measurement results • REST API interface

R&S®ELEMC-EDB enhanced data base

Prerequisites	R&S®ELEMI-A or R&S®ELEMS-C or R&S®ELEMS-R or R&S®ELEMC-OFF9
Software features	extend concurrent use of central data base for up to 20 users

R&S®ELEMC-ATB EUT test bench control

Prerequisites	R&S®ELEMI-S or R&S®ELEMS-S (R&S®ELEMS-AMEX, R&S®ELEMC-DEX or R&S®ELEMC-REM recommended)
Software features	• device drivers for EUT monitoring and EMI accessory control with test bench system (e-motor test bench) • test flow synchronization with test bench for EMS and EMI tests • data synchronization between test bench software and R&S®ELEKTRA EMC test software (tables, graphics) • EMI overview measurement on a complete test bench test cycle with finding the maximum emission by varying selected test bench parameters like speed, torque, operation mode of the e-motor • EMS test with keeping the worst-case deviation for all active parameters during the full dwell time
Supported device classes	
Test bench driver	• EUT monitoring: AVL interface driver for EMS • accessories control: AVL test bench driver for EMI • AVL®PUMA/Concerto test bench control software required

Additional tools included in base software packages

Test setup	migration wizard for auto tests from R&S®EMC32
Measurement result display	merge wizard for tables (maximum, minimum, average, custom formula) intersection or union of frequency ranges

Software bundles

R&S®ELEMI-EA software bundle containing R&S®ELEMI-E and R&S®ELEMI-A

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)
Key features	see details of R&S®ELEMI-E and R&S®ELEMI-A

R&S®ELEMI-AS software bundle containing R&S®ELEMI-A and R&S®ELEMI-S

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements) and R&S®ELEMI-E
Key features	see details of R&S®ELEMI-A and R&S®ELEMI-S

R&S®ELEMI-EAS software bundle containing R&S®ELEMI-E, R&S®ELEMI-A and R&S®ELEMI-S

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)
Key features	see details of R&S®ELEMI-E, R&S®ELEMI-A and R&S®ELEMI-S

R&S®ELEMS-CS software bundle containing R&S®ELEMS-C and R&S®ELEMS-S

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)
Key features	see details of R&S®ELEMS-C and R&S®ELEMS-S

R&S®ELEMS-RS software bundle containing R&S®ELEMS-R and R&S®ELEMS-S

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)
Key features	see details of R&S®ELEMS-R and R&S®ELEMS-S

R&S®ELEMS-CRS software bundle containing R&S®ELEMS-C, R&S®ELEMS-R and R&S®ELEMS-S

Prerequisites	R&S®EMCPC license dongle and system requirements (see Minimum system requirements)
Key features	see details of R&S®ELEMS-C, R&S®ELEMS-R and R&S®ELEMS-S

Software update service for R&S®ELEKTRA software

R&S®ELEMI-E

No software update service required for R&S®ELEMI-E.

All other R&S®ELEMI, R&S®ELEMS, R&S®ELEMC software licenses

Software upgrade options for R&S®ELEKTRA software (required from version 3.10).

Prerequisites	license for the respective software product
Key features	1 year software update service in order to run later versions of the R&S®ELEKTRA software (including enhancements and additional functionality), than the available version at the time of purchase of the respective license - software update service is provided as a key code for the R&S®EMCPC license card - without software update service, only the purchased version and minor versions, if available, with corrections can be used - installing a new software version with only a part of the software update service results in deactivation of functions in new software versions, because of software dependencies - other validity periods than 1 year are available on request - the software update service is not required within the warranty period of 1 year after purchase of the software license

Ordering information

Designation	Type	Order No.
Hardware		
License dongle	R&S®EMCPC	5601.0018.02
Software		
Essential EMI test software, for conducted and radiated emissions	R&S®ELEMI-E	5601.0030.02
Advanced EMI test software, for conducted and radiated emissions	R&S®ELEMI-A	5601.0053.02
EMI system test software, for conducted and radiated emissions	R&S®ELEMI-S	5601.0076.02
EMS test software, for conducted susceptibility	R&S®ELEMS-C	5601.0099.02
EMS test software, for radiated susceptibility	R&S®ELEMS-R	5601.0118.02
EMS system test software, for conducted and/or radiated susceptibility	R&S®ELEMS-S	5601.0130.02
Generic drivers	R&S®ELEMC-DRV	5601.0230.02
EMC extension to report generation	R&S®ELEMC-REP	5601.0460.02
Oscilloscope drivers (monitoring)	R&S®ELEMC-SCP	5601.0630.02
Radiated spurious emission measurement	R&S®ELEMI-RSE	5601.0253.02
EMI extension to multiband (multi receiver) measurement	R&S®ELEMI-MBM	5601.0676.02
3D evaluation	R&S®ELEMI-3D	5601.0260.02
5G signaling, for R&S®CMX500	R&S®ELEMC-5GS	5601.0276.02
RSE 5G measurement, in line with FCC regulations	R&S®ELEMI-5GFC	5601.0682.02
EMS test software, for automotive and military standards	R&S®ELEMS-AMEX	5601.0353.02
EMS waveform management software, for AIM 7351731 standard	R&S®ELEMS-AIM	5601.0582.02
EMC base software, for offline pre/postprocessing	R&S®ELEMC-OFF9	5601.0599.02
EMC extension, for wireless signaling	R&S®ELEMS-WRLS	5601.0701.02
EMC extension, for cellular signaling	R&S®ELEMS-CELS	5601.0699.02
Data exchange interface	R&S®ELEMC-DEX	5601.0547.02
EMC test list automation	R&S®ELEMC-TLA	5601.0560.02
EMI out-of-band measurements	R&S®ELEMC-OOB	5601.0724.02
Enhanced data base	R&S®ELEMC-EDB	5601.0530.02
EMS extension audio breakthrough	R&S®ELEMS-ABT	5601.0730.02
EMS extension, for MIL-STD 461, CS103/CS104/CS105	R&S®ELEMS-C345	5601.0576.02
EMC extension, for remote control interface	R&S®ELEMC-REM	5601.0553.02
EMC extension, for EUT test bench control	R&S®ELEMC-ATB	5601.2340.02
EMS extension, for rotating tuner reverberation chamber	R&S®ELEMS-RVC	5601.2410.02
Software bundles		
EMI advanced test software package	R&S®ELEMI-EA	5601.0424.02
EMI system test software package	R&S®ELEMI-EAS	5601.0382.02
EMI system test software extension package	R&S®ELEMI-AS	5601.0518.02
EMS system test software package conducted	R&S®ELEMS-CS	5601.0447.02
EMS system test software package radiated	R&S®ELEMS-RS	5601.0360.02
EMS system test software package conducted and radiated	R&S®ELEMS-CRS	5601.0401.02

Designation	Type	Order No.
Software maintenance (required from version 3.10)		
1 year software maintenance	R&S®ELEMI-A	5601.0053.81
1 year software maintenance	R&S®ELEMI-S	5601.0076.81
1 year software maintenance	R&S®ELEMS-C	5601.0099.81
1 year software maintenance	R&S®ELEMS-R	5601.0118.81
1 year software maintenance	R&S®ELEMS-S	5601.0130.81
1 year software maintenance	R&S®ELEMC-DRV	5601.0230.81
1 year software maintenance	R&S®ELEMC-REP	5601.0460.81
1 year software maintenance	R&S®ELEMC-SCP	5601.0630.81
1 year software maintenance	R&S®ELEMI-RSE	5601.0253.81
1 year software maintenance	R&S®ELEMI-MBM	5601.0676.81
1 year software maintenance	R&S®ELEMI-3D	5601.0260.81
1 year software maintenance	R&S®ELEMS-5GS	5601.0276.81
1 year software maintenance	R&S®ELEMI-5GFC	5601.0682.81
1 year software maintenance	R&S®ELEMS-AMEX	5601.0353.81
1 year software maintenance	R&S®ELEMS-AIM	5601.0582.81
1 year software maintenance	R&S®ELEMC-OFF9	5601.0599.81
1 year software maintenance	R&S®ELEMS-WRLS	5601.0701.81
1 year software maintenance	R&S®ELEMS-CELS	5601.0699.81
1 year software maintenance	R&S®ELEMC-DEX	5601.0547.81
1 year software maintenance	R&S®ELEMC-TLA	5601.0560.81
1 year software maintenance	R&S®ELEMC-OOB	5601.0724.81
1 year software maintenance	R&S®ELEMC-EDB	5601.0530.81
1 year software maintenance	R&S®ELEMS-ABT	5601.0730.81
1 year software maintenance	R&S®ELEMS-C345	5601.0576.81
1 year software maintenance	R&S®ELEMC-REM	5601.0553.81
1 year software maintenance	R&S®ELEMC-ATB	5601.2327.81
1 year software maintenance	R&S®ELEMS-RVC	5601.2427.81

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