

R&S®VSE

Vector Signal Explorer

Release Notes

Software Version V2.31

These Release Notes are for following models of the R&S®VSE Vector Signal Explorer:

R&S® VSE Basic Edition, order no. 1345.1011.06
R&S® VSE Enterprise Edition, order no. 1345.1105.06

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The software makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" provided with the product.

The following abbreviations are used throughout this document: R&S®VSE is abbreviated as R&S VSE.

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1 Information on the current version and history

1.1 New functions

The following table lists the new functions and indicates the version in which the new function was introduced:

New function of firmware V2.31:

Version	Function
V2.31	This is the last version supporting Windows 7. R&S VSE will drop support for Windows 7 with the next version.
V2.31	Support for the following new options in combination with R&S PVT360A: <ul style="list-style-type: none"> • VSE-PVT: VSE base software with PVT360A, part number 1345.2401.02 • VSE-KP7: Analog modulation analysis (AM/FM/PM), part number 1345.2460.02 • VSE-KP10: GSM, EDGE, EDGE Evolution and VAMOS measurements, part number 1345.2501.02 • VSE-KP18: Amplifier measurements, part number 1345.2418.02 • VSE-KP18D: Direct DPD measurements, part number 1345.2424.02 • VSE-KP18F: Frequency response measurements, part number 1345.2430.02 • VSE-KP18M: Memory polynomial DPD, part number 1345.2447.02 • VSE-KP70: Vector signal analysis, part number 1345.2453.02 • VSE-KP70M: Multi-modulation analysis, part number 1345.2476.02 • VSE-KP70P: BER PRBS measurements, part number 1345.2482.02 • VSE-KP72: WCDMA FDD measurements, uplink/downlink, part number 1345.2518.02 • VSE-KP96: OFDM signal analysis, part number 1345.2499.02 • VSE-KP100: LTE FDD measurements, uplink/downlink, part number 1345.2524.02 • VSE-KP102: LTE-A and MIMO downlink measurements, part number 1345.2530.02 • VSE-KP104: LTE TDD measurements, uplink/downlink, part number 1345.2547.02 • VSE-KP106: LTE NB-IoT measurements, uplink/downlink, part number 1345.2553.02 • VSE-KP144: 5G NR measurements, uplink/downlink, Rel. 15, part number 1345.2560.02 • VSE-KP146: 5G NR MIMO measurements, downlink, part number 1345.2576.02 • VSE-KP148: 5G NR measurements, uplink/downlink, Rel. 16, part number 1345.2582.02 • VSE-KP171: 5G NR measurements, uplink/downlink, Rel. 17, part number 1345.2599.02 • VSE-KP175: O-RAN measurements, part number 1345.2601.02 • VSE-KP201: OneWeb measurements, part number 1345.2618.02
V2.31	Support for the following new options in combination with R&S CMP200: <ul style="list-style-type: none"> • CMP-KM150: Signal Analysis Base Software, part number 1212.3972.02

- CMP-KM152: Signal Analysis Digital, part number 1212.3989.02
- CMP-KM580: OneWeb reverse link measurements, part number 1212.4085.02

V2.31	Support for the following new options in combination with R&S CMP180: <ul style="list-style-type: none"> • CMP-KM150: Signal Analysis Base Software, part number 1212.3972.02 • CMP-KM152: Signal Analysis Digital, part number 1212.3989.02
V2.31	R&S VSE-K60P: Transient Phase Noise Measurements
V2.31	R&S VSE-K8: Handling of encrypted waveform files added

New function of firmware V2.30:

Version	Function
V2.30	Support for external frontends with R&S RTP. <ul style="list-style-type: none"> • R&S FE44S 44 GHz Up/Down Converter, part number 1338.7001.02 • R&S FE50DTR 50 GHz Up/Down Converter, part number 1347.4099.02 <p>Requires R&S RTP-K553 "External Frontend Control" and RTP Firmware Version 5.30 or higher.</p>
V2.30	Support for R&S PVT360A, R&S CMP180 and R&S CMP200 radio communication analyzers: <ul style="list-style-type: none"> R&S PVT360A, part number 1201.0002K36 R&S CMP180, part number 1201.0002K18 R&S CMP200, part number 1201.0002K20
V2.30	Support for R&S FSV3050 and R&S FSVA3050: <ul style="list-style-type: none"> R&S FSV3050, part number 1330.5000K50 R&S FSVA3050, part number 1330.5000K51
V2.30	R&S VSE-K18: new features: FFT parameters for all frequency domain displays are now configurable.
V2.30	R&S VSE-K8: Bluetooth® basic rate / enhanced data rate / low energy measurements.
V2.30	R&S VSE-K70: LSB first bit ordering is now supported as demodulation parameter.
V2.30	Supports R&S VSE-K201 option: <ul style="list-style-type: none"> OneWeb Reverse Link Measurement.
V2.30	Added support for R&S FSWP Low Distortion / Low Noise toggle.
V2.30	R&S VSE-K91BE: Added support of R&S FSWP-B320 R&S VSE-K91AX/BE: Supports Channel Decoding (max. One user per Resource Unit RU). R&S VSE-K91/N/AC/AX/BE: Tracking/Estimation dialog, new I/Q Mismatch Compensation Per Subcarrier.

V2.30	<p>R&S VSE-K144/-K146/-K148/-K171/-K175: Signal demodulation and analysis in line with TS38.211 V17.3.0. Time Alignment, Transmit On/Off Power, ACLR, SEM measurements in line with TS38.141-1/2 V17.6.0, TS38.521-1 V17.5.0 and TS38.521-2 V16.12.0.</p> <p>Evaluate maximum crest factor over multiple frames. Visualize boosted / de-boosted allocations in constellation diagram. Provide allocation specific color coding in constellation diagram. PN sequence can optionally be generated for only DL symbols. Evaluate Bit/s in bitstream.</p> <p>K146: Constellation diagram after MIMO decoding. K148: N_ID¹ for the sequence generation of PDSCH/PUSCH DMRS. K171: Automatic determination of capture time in FR2-2. K171: UL FR1: EVM calculation for reported transient period. K175: Test model 3.2.5.1.1 in UL.</p>
V2.30	<p>Support for R&S RTO6 bandwidth upgrade options:</p> <p>R&S RTO6-B91: 1802.0199.02 R&S RTO6-B92: 1802.0201.02 R&S RTO6-B93: 1802.0218.02 R&S RTO6-B94: 1802.0224.02 R&S RTO6-B96: 1802.0230.02</p> <p>R&S RTO6-B201: 1801.7277.02 R&S RTO6-B202: 1801.7283.02 R&S RTO6-B203: 1801.7290.02 R&S RTO6-B204: 1801.7302.02 R&S RTO6-B206: 1801.7319.02 R&S RTO6-B212: 1801.7325.02 R&S RTO6-B213: 1801.7331.02 R&S RTO6-B214: 1801.7348.02 R&S RTO6-B216: 1801.7354.02 R&S RTO6-B223: 1801.7360.02 R&S RTO6-B224: 1801.7377.02 R&S RTO6-B226: 1801.7383.02 R&S RTO6-B234: 1801.7390.02 R&S RTO6-B226: 1801.7402.02 R&S RTO6-B246: 1801.7419.02</p>

New function of firmware V2.20SP1:

Version	Function
V2.20SP1	R&S VSE-K91 now supports IQ Mode of R&S RTO6 devices
V2.20SP1	R&S VSE-K18: Memory Polynomial DPD (K18M) now available in offline mode (no instruments connected)

New function of firmware V2.20:

Version	Function
V2.20	<p>Support for external frontends with R&S FSW.</p> <ul style="list-style-type: none"> • R&S FE44S 44 GHz Up/Down Converter, part number 1338.7001.02 • R&S FE50DTR 50 GHz Up/Down Converter, part number 1347.4099.02 <p>Requires R&S FSW-K553 "External Frontend Control" and FSW Firmware Version 5.10 or higher.</p>
V2.20	<p>Support for "Local VSE Enabler" options on the following device models:</p> <ul style="list-style-type: none"> • R&S FSV3003, order number 1330.5000.xx • R&S FSVA3000, order number 1330.5000.xx • R&S FSW, order number 1331.5003.xx
V2.20	<p>Support for new R&S ZNL Vector Network Analyzer models:</p> <p>R&S ZNL14, order number 1323.0012K14</p> <p>R&S ZNL20, order number 1323.0012K20</p>
V2.20	<p>Support for a custom scaling factor when loading *.wav files to convert the Volt values stored in the file to dBm. This new setting is part of the "Recall I/Q Recording" dialog.</p>
V2.20	<p>Added new toggle button "Force Update" in the "Recall I/Q Recording" dialog to let R&S VSE reload the IQ file just before every playback or refresh operation. This feature allows for external modifications of the IQ file in the background while VSE is using it.</p>
V2.20	<p>R&S VSE-K96:</p> <ul style="list-style-type: none"> • Support of external frontends. • Optional doubling of sample rate, phase compensation. • Transform Decoding: User can select how to react on PILOT/DONTCARE cells. • New version of R&S VSE-K96 Wizard: Higher QAM orders, user-defined constellations, store received symbols as pilot values, select cells by using step sizes
V2.20	<p>R&S VSE-K18: New features "Power Servoing" and "Detailed MSE".</p> <p>R&S VSE-K18M: New Hammerstein model and possibility to apply memory polynomial model to any given waveform.</p>
V2.20	<p>R&S VSE-K60C: Chirp analysis using manually defined chirp time stamps and start/stop frequencies.</p>
V2.20	<p>R&S VSE-K70: New mappings "DVB_RCS2" for $\pi/2$-BPSK, QPSK, 8PSK and 16QAM.</p> <p>Support for DVB-S2X super frame measurement added in DVB-S2(X) configuration tool.</p>
V2.20	<p>R&S VSE-K91BE: Supports MIMO.</p> <p>R&S VSE-K91BE: Signal Field result supports U-SIG overflow within the EHT-SIG section.</p> <p>R&S VSE-K91AX/BE: User can configure Wiener Relative Delay Spread.</p> <p>R&S VSE-K91N/AC: Supports channel smoothing using Wiener 'Interpolation'.</p>
V2.20	<p>R&S VSE-K100/-K104: New 1024QAM test models (E-TMs 2b and 3.1b)</p>

V2.20	R&S VSE-K106: Support Save & Load User defined sets Support NB-IoT Downlink test model (N-TM) Support Bitstream result display with BER results Added NPDSCH Settings
V2.20	R&S VSE-K175: In line with O-RAN.WG4.CONF.0-v05.00. Throughput measurements Test cases 3.2.3.3.2-11 and 3.2.5.3.2-11. Test cases 3.2.5.1.1-8 and 3.2.3.1.1-18 for <20MHz. Test cases 3.2.5.1.1-8 and 3.2.3.1.1-18 with 15kHz SCS Test cases 3.2.6.1.1 - 5
V2.20	R&S VSE-K144/-K146/-K148: Signal demodulation and analysis in line with TS38.211 V17.1.0. Time Alignment, Transmit On/Off Power, ACLR, SEM measurements in line with TS38.141-1/2 V17.5.0, TS38.521-1 V17.4.0 and TS38.521-2 V16.11.0. PUCCH format 3 and 4. BWP specific filtering. Multi numerology in Uplink. Time alignment error measurement supports intra-band contiguous carrier aggregation. Optional transport block size calculation including allocation gaps
V2.20	R&S VSE-K171: 5G NR R17 Extension for Uplink / Downlink. Extending NR operation to 71GHz (Deploy frequency range FR2-2; Channel bandwidth up to 2 GHz; 480 kHz and 960 kHz for BWP, SS/PBCH blocks, PRACH; enhanced PUCCH formats 0/1/2/4). 1024 QAM modulation. 35 MHz and 45 MHz channel bandwidth. 3GPP test models 2b and 3.1b according to TS38.141-1 V17.5.0.

New function of firmware V2.10SP1:

Version	Function
V2.10 SP1	VSE uses level information stored in .wv files.

New function of firmware V2.10:

Version	Function
V2.10	Support for R&S power meters. See VSE datasheet for details.
V2.10	Support for R&S FPL1-B11 option. Requires R&S FPL firmware version 1.80 or newer
V2.10	Support for new R&S spectrum analyzer models: R&S FPL 1014 1304.0004K14 R&S FPL 1026 1304.0004K26 R&S ZNL4 1323.0012K04
V2.10	R&S VSE-K7: Support of Settling Time Measurements.

V2.10	R&S VSE-K91BE: Support of IEEE 802.11be measurements.
V2.10	R&S VSE-K149: Support of user-defined groups of packets, Evaluation Offset, MAC FCS, SRMarker, Pulse Rise-Time Measurement, STS Gap and finer burst/sync configuration.
V2.10	R&S VSE-K18: Support of auto level and power sensors. Automatic correction of input/output levels. Support of offline direct DPD (no generator connected).
V2.10	R&S VSE-K106: Support NB-IoT Non-anchor carriers. CONFigure[:LTE]:TYPE <ANCHor NANChor>
V2.10	R&S VSE-K175: In line with O-RAN.WG4.CONF.0-v04.00 5G: Test Cases: FDD 3.2.3.1.1-17, TDD 3.2.5.1.1-8 (BW 20 MHz to 80 MHz) LTE: FDD Test Case 3.2.3.7.1 - 3.2.3.7.6 (DL & UL)
V2.10	R&S VSE-K144/-K146/-K148: Signal demodulation and analysis in line with TS38.211 V16.7.0. Multi processing of multi carrier analysis for increased analysis speed New SCPI query returns all result summary entries at once Optionally allow PDSCH in unused CORESET CCEs
V2.10	R&S VSE-K70: Configuration tool for DVB-RCS2 measurements available (linear modulation reference waveforms).
V2.10	R&S VSE-K6: Support for segmented capture with a connected R&S FSW instrument.

New function of firmware V2.00:

Version	Function
V2.00	Supports R&S VSESIM-VSS
V2.00	Supports R&S VSE-K149 option: HRP UWB measurements according to IEEE 802.15.4 and 802.15.4z
V2.00	Supports R&S VSE-K175 option: O-RAN Measurements. In line with O-RAN.WG4.CONF.0-v02.00.
V2.00	Supports R&S VSE-K148 option: 5G NR R16 Extension for Uplink / Downlink.
V2.00	Supports VSE-K18, VSE-K18D, VSE-K18F, VSE-K18M options : Amplifier (and other non-linear devices) characterization measurements including digital predistortion
V2.00	R&S VSE-K144/-K146/-K148: <ul style="list-style-type: none"> ● Signal demodulation and analysis in line with TS38.211 V16.4.0. ● Time Alignment, Transmit On/Off Power, ACLR, SEM measurements in line with TS38.141-1/2 V16.6.0 and TS38.521-1/2 V16.6.0. ● Test models in line with TS38.141-1/2 V16.6.0 ● Generator to VSE settings transfer (requires generator 5G application version 20.12 or later) ● RS Magnitude display ● Frequency Error vs. Subframe display

- Result summary display for UL in-band emission
- Extension of Beamforming Summary for Average RS Weights and rel. Power results
- 5G ACLR supports power unit dBm/MHz
- Analysis of multiple CSI antenna ports
- Power mode "Average active symbols"
- Auto detection of Cell IDs in the range of 0 to 10 for downlink
- Auto Demod Once functionality
- CORESET reference data verification according to NR-TM PN23
- Additional settings to ease the configuration of multicarrier setups
- Custom definition of symbol time position
- Extension of Bitstream for total number of bits and bit errors of PDSCH/PUSCH
- Intraslot frequency hopping for PUCCH format 2
- Bitstream format "Symbols" or "Bits" selectable

V2.00 R&S VSE-K544: Added refresh button to parse files while the dialog is open.

V2.00 R&S VSE-K70: New predefined digital standard: DMR (Digital Mobile Radio).

V2.00 Support for external frontends with FSV3000 and FSVA3000.

- R&S FE44S "External Frontend 24 GHz to 44 GHz", order number 1338.7001.02
- R&S FE50DTR "External Frontend up to 50 GHz", order number 1347.4099.02

Requires FSV3-K553 "External Frontend Control" and FSV3000 Firmware Version 1.50 or higher.

1.2 Modified functions

The following table lists the modified functions and indicates the version in which the modification was carried out:

Modifications of firmware V2.30:

Version	Function
V2.30	R&S VSE-K18M: memory polynomial coefficients, scaling changed.
V2.30	R&S VSE-K70: Predefined digital standards for Bluetooth now set the bit ordering to LSB first.
V2.30	R&S VSE-K171: For FR2-2, the default value of the number of slots per frame to analyze is adapted to 80 according to 38.141-2 V17.9.0
V2.30	R&S VSE-K144: In UL TP the value range of the decoding parameter I_MCS is extended.

Modifications of firmware V2.20:

Version	Function
V2.20	The "Register VSE" menu item is no longer opening up a new e-mail window, but instead redirecting to the R&S GLORIS support portal.
V2.20	R&S VSE-K91AX/BE: All RUs in an OFDMA signal are highlighted green within the PPDU Config dialog and produce results.
V2.20	R&S VSE-K144: Transform precoding configurable also via physical settings dialog

Modifications of firmware V2.10:

Version	Function
V2.10	Saving screenshots via SCPI has been optimized. If the chosen file format (HCOPY:DEVICE:LANGUAGE) differs from the file type ending, the file is saved in the format of the file type.
V2.10	R&S VSE-K175: 5G: For TDD UL Test Cases, the special slot is not analyzed
V2.10	R&S VSE-K146: The number of input sources can be increased to 32 in Multi SISO mode
V2.10	R&S VSE-K144: FR2 renamed to FR2-1 according to 3GPP
V2.10	R&S VSE-K144: Payload bits are also output when CRC fails

V2.10	R&S VSE-K144: Wording of DMRS-Downlink-R16 changed to DMRS-Downlink according to 38.211
V2.10	R&S VSE-K149: Payload octets start with the LSB instead of the MSB as required in IEEE 802.15.4.

Modifications of firmware V2.00:

Version	Function
V2.00	Loading an .iqw file via SCPI now allows to specify a center frequency.
V2.00	R&S VSE-K144: A multicarrier channel spacing less than the nominal channel spacing can be configured.
V2.00	R&S VSE-K144: The frequency error limit check result is now also indicated for Min and Max in the result summary
V2.00	R&S VSE-K144: Frequency error limit check can be optionally switched off
V2.00	R&S VSE-K70: Preview windows have been removed to provide more compact dialogs.
V2.00	R&S VSE-K70: In order to better visualize the symbol transitions for result type 'Vector I/Q', the sample points are now connected in density trace mode.
V2.00	R&S VSE-K7: Option renamed to AM/FM/PM Modulation Analysis.
V2.00	R&S VSE-K7: Higher resolution of modulation frequency provided in Result Summary table.

1.3 Improvements

The following tables list the improvements and indicate since which version the issue could be observed:

Improvements of firmware V2.31:

since	Function
V2.31	R&S VSE-K146: In certain MIMO scenarios with two FSWs, the YIG filter was activated by mistake. The issue is fixed.
V2.31	Configuration of Floating Servers didn't work while VSE was run in Demo Mode. This issue is solved.
V2.20	Using a device's External Frontend connection and switching to IQ file mode leaves the "ExtFe" message in the Global Info Bar visible. This issue is solved.

Improvements of firmware V2.30:

since	Function
V2.20	R&S VSE-K144: The EVM vs. Symbol X Carrier results could not be exported in binary format. This issue is solved.
V2.20	R&S VSE-K144: For NR-TM 3.3 and 3.2, the n_RNTI=0.2 PDSCH allocation needs to be excluded from the EVM calculation. This issue is solved.
V2.10	VSE's GUI was not scaling properly with high DPI and high-resolution monitors anymore. This issue is solved.
V2.20	If VSE was connected to an R&S FSV3000 or FSVA3000 device with option B1000 installed, VSE was not always respecting the bandwidths correctly. This issue is solved.
V2.00	Using the VSE Enabler option on R&S FSW, R&S FSV3000 or R&S FSVA3000 device, caused the VSE-K144 to no longer recognize the 5G NR application. This issue is solved.
V1.50	Using SCPI or GUI to load the same I/Q file twice doesn't reload the I/Q file's metadata. This issue is solved.

Improvements of firmware V2.20SP1:

since	Function
V2.20SP1	When connected to either R&S FSW, R&S FSV3000 or R&S FSVA3000 devices, VSE was unable to properly configure External Frontends for some firmware versions. This issue is solved.

Improvements of firmware V2.20:

since	Function
V2.20	R&S VSE didn't disable certain settings in the Trigger dialog in case the connected device doesn't support them. This issue is solved.
V2.20	R&S VSE-K175: In multi carrier scenarios, the remote command TRAC4:DATA? TRACE4 did not return the bit error rate. This issue is solved.
V2.20	R&S VSE-K6: Segmented Capture reliability has been improved when connected to an R&S FSW.
V2.10	R&S VSE: The Y axis in the IQ Analyzer's "Phase vs Time" diagrams couldn't be changed to degrees (°). Instead, it stayed at radians. This issue is solved.
V2.10	When connected to a device which supports external mixers, the R&S VSE was limiting the available IQ bandwidth to 512 MHz, regardless of the device's maximum bandwidth. This issue is solved.
V2.10	R&S VSE models 1310.0002K05 and 1310.0002K06 were not recognized under all circumstances and prevented the user from starting VSE. This issue is solved.
V2.10	Renaming of measurement groups and channels worked reliably only via SCPI. It didn't work properly via the GUI. This issue is solved.
V2.00	R&S VSE Enterprise Edition: Clicking the "Delete All Instruments" button in the Instruments window didn't correctly delete all instruments in case a save set from R&S VSE Basic Edition had previously been loaded. This issue is solved.
V2.00	R&S VSE failed to create a Device Footprint silently without an error message. The corresponding Footprint file was not created. This issue is solved.

Improvements of firmware V2.10SP2:

since	Function
V2.10	VSE licenses without dongle did not enable the corresponding options when installed on R&S RTO and RTP devices. This issue is solved.

Improvements of firmware V2.10SP1:

since	Function
V2.10	VSE-K544 was not enabled when using VSE-SIMCAD license key. This issue is solved.
V2.00	Loading a .wv file as IQ source caused the center frequency to be displayed as 1 kHz instead of 0 Hz. This issue is solved.

Improvements of firmware V2.10:

since	Function
V2.10	Pressing enter in file dialogs did not save or open the file. This issue is solved
V2.10	The new 15 dB gain step of option FSW-B24 for FSW43 and above was not available in all cases. This issue is solved.
V2.10	R&S VSE-K144: In multi carrier scenarios, the display of the frequency of the RF up-conversion was not updated with respect to the global multi carrier frequency. The issue is fixed.
V2.10	R&S VSE-K144: In multi carrier scenarios, the global multi carrier frequency could not be increased above 40 GHz under special conditions. The issue is fixed.

Improvements of firmware V2.00SP2:

since	Function
V2.00	Manual trigger mode wasn't allowed for R&S RTO6 devices. This issue is solved.
V2.00	Differential I+Q mode was unavailable for R&S RTO6. This issue is solved.
V2.00	R&S VSE-K149: Analog baseband modes were unavailable when connected to an R&S RTO6 device. This issue is resolved.

Improvements of firmware V2.00SP1:

since	Function
V2.00	RTx-K0 didn't allow VSE to start directly on the RTX device. This issue has been resolved.
V2.00	VSE-K0 didn't include VSE-K91AX. This issue has been resolved.

Improvements of firmware V2.00:

since	Function
V1.90	R&S VSE-K6A: When using segmented capture with a connected Rohde & Schwarz oscilloscope, the maximum possible number of events could not be configured. This issue has been resolved.
V1.80	R&S VSE-K144: The sequence generation of the PTRS for UL TP was adapted according to TS38.211 with respect to m and m'.
V1.80	R&S VSE-K144: For test model 3.2 and 3.3, the user ID (RNTI) changed for different PDSCH allocations. The issue is solved.

V1.80

R&S VSE-K144: For dynamic spectrum sharing, the LTE CRS were not excluded when calculating the OSTP. The issue is solved.

1.4 Known issues

The following tables list the known issues and indicate since which version the issue could be observed:

Known issues of software:

since	Function
V2.31	When using R&S VSE with R&S RTP devices, the sampling rate can be set to 40GSa/s for all channel configurations regardless of the device supporting this only on specific channel combinations.
V2.10	VSE-K18: Zeroing, Meas->Ref, and Unit settings currently not available in power sensor mode.
V2.00	VSE-K6: When using segmented capture with an oscilloscope device, the appropriate limit on the maximum no. of segments will not be reported until after a sweep has been performed.
V1.90	Activation and immediate deactivation of the RTx Expert Mode will lead to a misleading information dialog which states that some parameters have been changed on the RTx. The parameters were not changed and the message can be ignored.
V1.70	R&S VSE-K6: Cumulative statistics for pulse-pulse values are always calculated with the default reference pulse setting. Non-default settings are only applied to the current capture statistics.
V1.70	R&S VSE-K146: For phase-coherent MIMO measurement with multiple NRQs and NRQ firmware earlier than 02.20.19111801: High power values for the most recently captured I/Q capture buffer and power spectrum measurements
V1.70	R&S VSE-K146: For phase-coherent MIMO measurements with multiple NRQs and NRQ firmware earlier than 02.20.19120202: Analysis results of first I/Q capture may return "sync failed".
V1.70	R&S VSE-K146: For phase-coherent MIMO measurements with multiple NRQs: Measuring with external trigger may not work for subcarrier spacings larger than 30kHz.
V1.50	LTE MIMO in combination with option K544 (User Defined Frequency Response Correction) results in an incomplete measurement. The capture does not finish.
V1.05	I/Q Vector display may slow down the R&S VSE when choosing a long record length.
V1.10	Saving and recalling Matlab files (*.mat) only supports ASCII compatible file names unless activated in Windows OS. In order to allow Unicode characters in file names, make sure to enable support for 8.3 file names on the drive(s) the file is being read from or exported to. For more information please refer to this MSDN: https://support.microsoft.com/de-de/help/121007/how-to-disable-8.3-file-name-creation-on-ntfs-partitions
V2.10	Installing VSE 2.10 after a more recent VSE version, like 2.20, causes the VSE Licenses to fail loading due to a R&S License Server version mismatch. Reinstalling a more recent R&S License Server version solves the issue.

The following table lists known issues with supported instruments and additional software:

Function	Instrument/ Software	FW/SW Version
R&S VSE-K100/104: Using the current R&S FSV or R&S FSW firmware, the Frame Start Offset calculation has an uncertainty of +/- 100 ns.	R&S FSV R&S FSW	all
K72: Using the current R&S FSV or R&S FSW firmware, the Trigger to Frame calculation has an uncertainty of +/- 100 ns.	R&S FSV R&S FSW	all
1. The Auto Level routine does not finish when connected with an R&S RTO. 2. The Reference Level setting does not work reliably.	R&S RTO	FW 2.6x.x FW 2.7x.x, FW 3.4.x.x
The R&S VSE software may stop working in random situations if Visa packages of different vendors are installed in parallel on the PC. Removing the ambiguity solves this issue.	Any VISA	
Using R&S VISA (V5.5.4.0) may cause the R&S VSE to stop measuring I/Q data. The issue was observed using the Waveform Mode of the RTO (default in R&S VSE-K6) or with high traffic on the LAN connection.	R&S VISA	5.5.4.0
K7: There is a carrier offset of up to 120 Hz in RF spectrum when using the Waveform mode for an ABW < 1,6 kHz. Please use the IQ mode for small bandwidths.	R&S RTO R&S RTP	all

2 Modifications to the documentation

The current documentation is up-to-date.

3 Software Installation

3.1 Validity information

The R&S VSE can only be installed on the 64-Bit version of Windows 7 or Windows 10. Windows 10 64 Bit is recommended. R&S VSE versions 2.40 and beyond won't support Windows 7 anymore.

3.2 Update information

The software installation file for the R&S VSE is one file including the main version number e.g. VSESetup_V1.30.exe. It will be referred to as VSESetup.exe later in the text. The file can be found on the Rohde & Schwarz web page.

3.3 Installing the Software on your PC

Performing the installation on your PC:

The R&S VSE needs some additional software components to run properly.

The following components are needed:

- Microsoft .NET Framework Version 4.0
- VISA (Virtual Instrument Software Architecture)

Install Microsoft .NET Framework

The R&S VSE installer will try to install the .Net 4.0 from the internet.

Install VISA

It is necessary to install VISA (Virtual Instrument Software Architecture) to access instruments connected to the PC via IEEE or LAN bus.

Please use the R&S VISA provided with the VSE installer or visit www.rohde-schwarz.com/rsvisa to get the latest version

Installing VSE

Please save the VSE Installer on your hard disc in order to install the Software

3.4 Installing Software Options

3.4.1 Software options included in base software

The K7 application software package is included in the base software. Therefore, it does not have a separate item in the installer to be selected.

3.4.2 Other Firmware Options within the VSESetup.exe File

General VSE Options

The R&S VSE-K70 and other application software packages have their own installation item and are therefore added to the selection list during the software update. Ensure that the checkboxes are checked if installation is requested.

ETL-K470 CDR License

The Convergent Digital Radio (CDR) feature available in the R&S VSE requires an Ethernet connection to an R&S ETL. The R&S ETL must have a valid R&S ETL-K470 CDR license and a firmware version 3.51 or later.

To use the R&S ETL CDR, you have to install the following R&S VSE packages:

- R&S VSE Vector Signal Explorer software
- R&S VSE K96 OFDM signal analysis
- Activate R&S ETL-CDR K470

When you activate the R&S ETL-K470, R&S VSE runs in an exclusive CDR mode. CDR mode is designed to analyze CDR signals within the VSE. Therefore, it has the following restrictions:

- You can only use the I/Q analyzer and the OFDM analysis for CDR signals. Using other (optional) applications is not possible, even if you have a valid license for them (for example on an R&S FSPC dongle).
- You can only connect to an R&S ETL. Connecting to other instruments otherwise supported by the R&S VSE is not possible.
- You can only connect to one R&S ETL at a time.

3.4.3 Enabling Options by Entering Option Key Codes



This section can be skipped if the option key was entered once.

To activate application software packages, you must enter a license key for validation.

If a XML-file with an option key was sent to you see the install description below.

The license key is in the device certificate or delivered as a part of the software package. The process is performed in the following steps:

1. Go to the "Help" menu
2. Press the "License" menu item.
3. Press the "Install Option" Button
A dialog box is displayed.
4. Enter the option key number.
5. Press "ENTER".
After a successful validation the message "Option Key valid" is displayed. If the validation failed, the option software is not installed.
6. Restart the software.

Installation of options via XML-file

1. Go to the "Help" menu.
2. Press the "License" menu item.
3. Press the button "Install Option by XML" button.
A file browser is displayed.
4. Select the path to the XML file (e.g. network drive or USB stick).
5. Press "Select".
After a successful validation the message "Option Key valid" is displayed. If the validation failed, the option software is not installed.
6. Restart the software.

4 Customer support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz product, contact our customer support center. A team of highly qualified engineers provides support and works with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz products.

Contact information

Contact our customer support center at www.rohde-schwarz.com/support or follow this QR code:



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