

R&S®ZVH Handheld Cable and Antenna Analyzer

Release Notes

Firmware Version V1.90

These Release Notes are for following models of R&S®ZVH Handheld Cable and Antenna Analyzer:

R&S®ZVH4, order no. 1309.6800.24
R&S®ZVH8, order no. 1309.6800.28

© 2021 Rohde & Schwarz GmbH & Co. KG
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>

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

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1 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 Functions of Firmware V1.90:

Version	Function
V1.90	Support for saving dataset in csv format (in Spectrum Analyzer mode only)
V1.90	SCPI command to read out memory trace
V1.90	SCPI command to check status of FSH-Z114

New Functions of earlier Firmware versions:

Version	Function
V1.80	Support of waveguide calibration and DTF measurements with waveguides
V1.80	AM/FM demodulation in Spectrogram application
V1.71	Support for R&S® ZN-Z103 Calibration Unit 1 MHz – 6 GHz
V1.70	Support for R&S® ZN-Z103
V1.70	SCPI command to retrieve IQ data
V1.70	FFT based SEM & ACLR (for NB-IoT)
V1.60	Support of HE400 antenna
V1.60	Support of optical power sensor UPM100 from ODM Inc.
V1.60	Display S21 & S11 or S21 & S22 measurements in one screen
V1.60	Support of Declassification procedures according to DoD 5220.22-M (see Instrument Security Procedures for more details)
V1.60	Added switch to force either sweep mode or FFT mode
V1.52	Support of FSH-K14 for long time recording
V1.52	Support of FSH-Z14 with USB adapter FSH-Z144
V1.52	Tone feature for Spectrogram and Spectrum Analyzer
V1.52	New support of power sensor, NRPx
V1.52	ZVH4View, save all traces from spectrogram to CSV format
V1.52	Coupling of Span settings from reflection measurement to DTF measurement
V1.52	Create folders on SD Card from File Manager
V1.51	new measurement application: R&S®ZVH-K29 Pulse Measurements with Power Sensor (using the NRP-Z81, NRP-Z85 or NRP-Z86 power sensors). This feature is supported for instruments starting at serial number 115331 for the R&S ZVH4 and 115239 for the R&S ZVH8. Instruments with lower serial numbers require an R&S®FSH-Z129 adapter cable.
V1.51	The amplitude range can now be entered as a numeric value instead of fixed steps
V1.51	Enabling and disabling coupling of span in DTF and reflection measurements is now supported
V1.51	R&S ZCAN calibration data file added
V1.51	Limit lines in VSWR and Cable Loss measurement are now supported
V1.51	Limit lines can now be selected during Wizard execution
V1.51	The user can now be prompted to change cable settings in wizard operation

V1.51	Spectrum Analyzer: Frequency counter resolution is now selectable between 0.1 Hz (low) and 0.1 mHz (high)
V1.51	R&S HL300 antenna transducer file added
V1.51	Creating folders on the SD card with the File Manager is now supported
V1.50	Channel Power Meter (R&S@ZVH-K19)
V1.50	Cable & Antenna Test: Added limit lines in 1-Port Cable Loss measurement
V1.50	The active calibration data are preserved when loading a dataset stored with another instrument
V1.50	ZVH View: Support of Microsoft Windows 8
V1.50	ZVH View: Spectrogram Playback
V1.50	ZVH View: Added possibility to select the Easy 1 Port calibration as the default calibration when using the Wizard
V1.43	ZVH View: Export to s2p file format
V1.42	Wizard extensions: Edit cable model and length while executing a Wizard sequence Define the number of measurements to perform Skip measurements Finish Wizard execution on demand
V1.42	Added remote control commands for performing a calibration
V1.42	Added the possibility to define limit lines when performing a Cable Loss measurement

1.2 Modified Functions

There are no modifications in Firmware V1.90

Modified Functions of earlier Firmware versions:

since	Function
V1.80	Support of discrete marker mode to set markers to discrete sweep points only
V1.80	Supports ZN-Z103 calibration up to 6 GHz
V1.80	Added SCPI support to acquire compass information
V1.70	Compass: Update World Magnetic Model coefficients to 2015-2020
V1.60	Removed the limitation to 3 points for triangulation
V1.60	MIMO configuration per carrier within LTE Carrier aggregation
V1.52	Decrease minimum Sweep Time from Zero span to 100 us
V1.51	ZVHView: lock and unlock buttons were added to the file control windows
V1.50	Spectrum Analyzer: modified the default display position of trace mathematics results

1.3 Improvements

The following tables list the improvements and indicate since which version these improvements are available:

Improvements in Firmware V1.90:

Version	Function
V1.90	Improved spur performance

Improvements of earlier Firmware versions:

since	Function
V1.80	Added "Waiting for Trigger" indication
V1.80	Enabled support for Rosenberger cables
V1.71	Communication issues with USB Power Sensors
V1.71	Device freeze while processing GPS data at selected locations/altitudes
V1.52	Increase maximum Reference Level from 30dB to 50dB
V1.51	Trace averaging did not work properly in Antenna & Cable Test - DTF operation with high accuracy calibration
V1.51	ZVH locked up if the wizard configuration contained a power meter dataset
V1.51	The Pincode protection did not work properly
V1.50	Spectrum Analyzer: Status of the preamplifier is displayed in the hardware settings summary
V1.50	Date and time indication available when playing back data recorded with the Spectrogram measurement application (R&S®ZVH-K14)
V1.50	Improved visualization of the highest peak per segment in Spectrum Emission Mask and 3GPP BTS Spurious Emission measurement
V1.50	ZVH View: Internal DC Bias measurement results in a dataset got lost when modifying settings in ZVH View and storing the dataset again. This has been fixed.
V1.50	ZVH View: Pass/fail information contained in ACLR datasets is now displayed
V1.50	ZVH View: Removed possible error message when opening the marker editor
V1.50	ZVH View: Display pass/fail information contained in ACLR datasets
V1.44	Network Analyzer: Re-enabled zero span measurements
V1.44	Fixed possibly corrupted instruction pictures after skipping a measurement in the Wizard
V1.43	Fixed possible instrument freeze (once a day during continuous operation)
V1.42	Removed possible error message when loading a dataset which stores a higher count of sweep points as defined in the current measurement
V1.42	ZVH View Report Generator: 4 traces are displayed in the report if a dataset containing a measurement with 4 traces is selected
V1.42	ZVH View Report Generator: Limit lines are displayed and checked if a dataset containing a DTF or VSWR measurement is selected
V1.42	ZVH View Report Generator: Removed possible display line offset if a dataset containing a Cable Loss measurement is selected
V1.42	ZVH View: The ZVH is now reliably recognized via USB if switched on with the USB cable already connected to the PC
V1.42	ZVH View: After loading a dataset and changing the marker search ranges these modifications will be preserved if the file gets saved as a dataset
V1.41	Network Analyzer: Increased the displayed resolution of marker results
V1.41	ZVH View: "File – Save As" did not work with Windows 7. This has been fixed.

1.4 Known Issues

The following table lists the known issues in V1.90:

Version	Function
Since V1.52	If NRP-Z5x Power Sensor is not functional a NRP-Z5x Firmware update to version V4.26 is required.

1.5 Modifications to the Documentation

You can download the latest manual from the R&S®ZVH4/ZVH8 FSH product web page at <http://www.rohde-schwarz.com/manual/fsh>.

2 Firmware Update

New firmware versions usually contain new features, improvements of existing functionality, bug fixes etc. When a new firmware version is available, it is recommended to replace the old firmware with the new one.

R&S®InstrumentView

Firmware release V1.90 corresponds to R&S®InstrumentView V2.3.1, which is available on the Rohde & Schwarz web page as a separate update package.

Although older versions of R&S®InstrumentView might be able to communicate with firmware release V1.90, an update of R&S®InstrumentView is highly recommended, as older R&S®InstrumentView versions might not support all functions included in the new firmware release.

FSH4View (a predecessor of InstrumentView) might still be able to communicate with firmware release V1.90, but might not support all functions included in the new firmware release.

Updating the firmware

The latest firmware version is available for download on the internet:

<http://www.rohde-schwarz.com/firmware/zvh>

The installation can be done via SD-Card or via USB-Stick



Before you update the firmware, you should make a backup of the data that you have stored on the R&S®ZVH Handheld Cable and Antenna Analyzer ZVH4/ZVH8 (datasets, screenshots, transducer factors etc.). You can make a backup with the tools available in the R&S®InstrumentView software package. The firmware update itself does not delete or modify that data, but it is recommended to perform a factory reset after the firmware update to update predefined limit lines, channel tables etc. The factory reset, however, does delete user data.

2.1 Preparing the Installation via SD-Card

In order to update the device after downloading the ZVH_V1_90.EXE installation file, an SD memory card is required, e.g. R&S HA-Z231 (1 GB), order # 1309.6217.00, or R&S HA-Z232 (2 GB), order # 1309.6223.00. Please make sure that your PC is equipped with an SD card reader.

Preparing the installation files

Insert an SD card into the SD card reader and wait until Windows® has identified the SD card as a new volume (e.g. D:)

Copy ZVH_V1_90.EXE into the root directory of the SD card, e.g. D:\

Execute ZVH_V1_90.EXE. The self-extracting .ZIP file will be unpacked.

The SD card should now contain the following files:

bootloader_ZVH_V1_90.bin
osimage_ZVH_V1_90.bin
updater_ZVH_V1_90.bin
splashscreen_ZV.bmp
ZVH_V1_90.EXE

Note:

Please make sure that only one file of each type is present on the SD card. The update mechanism will reject the card if it detects two versions of the same file type (e.g. bootloader_ZVH_V1_80.bin and bootloader_ZVH_V1_90.bin) in the root directory and abort the update later on.

Prepare the instrument

Switch the instrument OFF.

Connect the R&S ZVH to AC mains via its power adapter.

Note:

The instrument firmware will refuse to perform the update if the instrument runs on battery.

Insert the SD card into the SD card slot at the right side of the instrument.

Continue with "Performing the Firmware Update on the Instrument" in Section 6.2.3.

2.2 Preparing the installation via USB (instruments with serial numbers above 105000)

In order to update the device after downloading the ZVH_V1_90.EXE installation file, a USB stick is required.

Preparing the installation files

Insert a USB stick into the USB slot and wait until windows has identified the USB stick as a new volume (e.g. D:)

Copy ZVH_V1_90.EXE into the root directory of the USB stick, e.g. D:\

Execute ZVH_V1_90.EXE. The self-extracting .ZIP file will be unpacked.

The SD card should now contain the following files:

bootloader_ZVH_V1_90.bin
osimage_ZVH_V1_90.bin
updater_ZVH_V1_90.bin
splashscreen_ZV.bmp

ZVH_V1_90.EXE

Note:

Please make sure that only one file of each type is present on the SD card. The update mechanism will reject the card if it detects two versions of the same file type (e.g. bootloader_SA_V1_80.bin and bootloader_SA_V1_90.bin) in the root directory and abort the update later on.

Prepare the instrument

Switch the instrument OFF.

Insert the USB stick into the USB slot of the instrument.

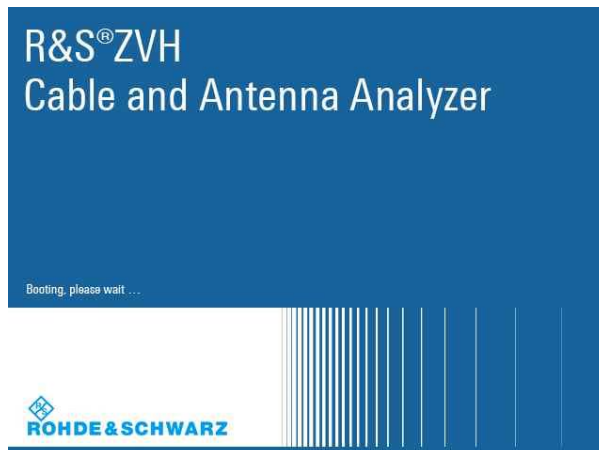
2.3 Performing the Firmware Update on the Instrument

The firmware update process is performed by the following steps:

1. Press the keys PRESET and 8 on the numeric keypad simultaneously.



2. Switch the instrument on and keep PRESET and 8 pressed for at least 5 seconds after the startup screen has appeared on the screen.



3. Release the keys PRESET and 8.

The ZVH will continue its boot process and after a couple of seconds the following information will appear on the screen:

Instrument Firmware Update

```
Searching for firmware update (updater_*.bin)
...Found \USB\updater_ZVH_V1_90.bin
...OK
Checking updater_ZVH_V1_90.bin: ... OK
```

Update instrument to software version V1.90
Press [ENTER] to update the firmware.
Press [CANCEL] to abort firmware updating.

Note:

If the AC mains connection is missing at the start of the firmware update process, the following message will appear at the bottom of the screen in step 3:

Instrument not powered by the power adapter. Please connect power adapter.
Press [ENTER] to retry.
Press [CANCEL] to abort firmware updating.

In this case check the power supply connection.
Continue the update process with step 4.

4. Press ENTER to start the firmware update process.

The instrument will perform the firmware update. This will take about 5 minutes. The progress of the update will be displayed in a sequence of messages on the screen.

Warning:

Do not switch the instrument off during the update process in order to avoid data corruption of the internal flash memory!

5. As soon as the firmware update is completed, the R&S ZVH will display the following message at the bottom of the screen:

Firmware updating is successfully completed.
Please switch off the instrument.

Switch the instrument off and on again. The ZVH will boot with the new firmware version.

6. After the boot process is completed, press SETUP – INSTRUMENT SETUP. Select "RESET TO FACTORY SETTINGS" by moving the cursor down the list with the cursor keys or the rotary knob. Confirm the selection with ENTER, and re-confirm with YES when prompted.
Please be patient: the subsequent reset and reboot process will take about a minute to complete.

Note:

Restoring the factory settings is necessary to update the pre-installed channel tables, cable models and transducer factors. If this step is omitted, bug fixes and updates to these pre-installed files will not be installed.

2.4 Performing the Self Alignment on the Instrument



This section is relevant for R&S ZVH4 and R&S ZVH8 shipped with firmware version 1.11 or below

In Cable & Antenna Test and Network Analyzer operating mode the instrument models R&S ZVH4 and R&S ZVH8 support a default set of calibration data, the so-called factory calibration. This dataset is used whenever the instrument displays "fcal" in the title bar.

Instruments which were shipped with firmware versions 1.11 or below need an update of this dataset, as V1.90 uses improved algorithms which need more data in order to obtain optimum results.

The self alignment procedure requires a calibration standard R&S FSH-Z28 (order # 1300.7810.03), which is suitable for R&S ZVH4 and R&S ZVH8 instruments, or at least a calibration standard R&S FSH-Z29 (order # 1300.7510.03) for R&S ZVH4 instruments. In addition a RF cable with two N connectors is required in order to provide a through connection between measurement port 1 and port 2.

The self alignment is performed by the following steps:

1. Switch the instrument on

2. Select Network operation by pressing MODE – Cable & Antenna Test.
3. Make sure that the instrument runs for at least 30 minutes at room temperature.
4. Press the keys SETUP – INSTRUMENT SETUP. Place the cursor on the menu entry "Self Alignment" by scrolling the menu bar down with the rotary knob and press ENTER.

The instrument will prompt you to confirm that the factory calibration data will be overwritten.

5. Press softkey YES.

The self alignment procedure will start and prompt you to connect the calibration standards and the through connection to port 1 and 2 in the sequence.

6. Follow the instructions until the instrument reports "Self Alignment Done!".
7. Press softkey EXIT to return to the measurement screen.

3 Firmware Options

You can equip the R&S®ZVH4/ZVH8 ZVH with optional functionality or firmware options like the Vector Network Analysis Application or the Channel Power Meter Application. These firmware options expand the functionality of the R&S®ZVH Handheld Cable and Antenna Analyzer ZVH with new measurement functions settings etc.



This section can be skipped if the option keys were already entered once. Option keys are not affected by a firmware update.

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

Press the SETUP key.

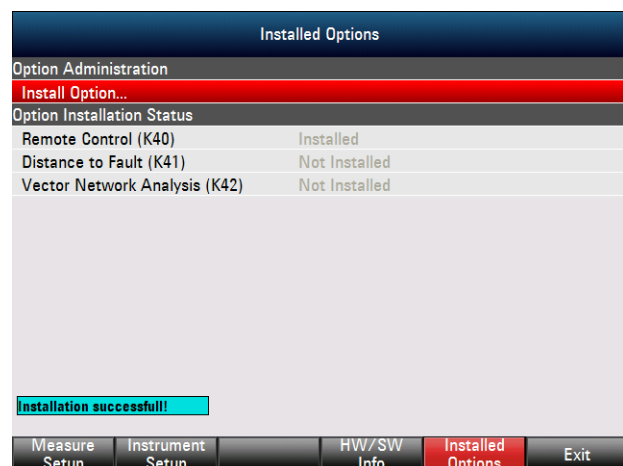
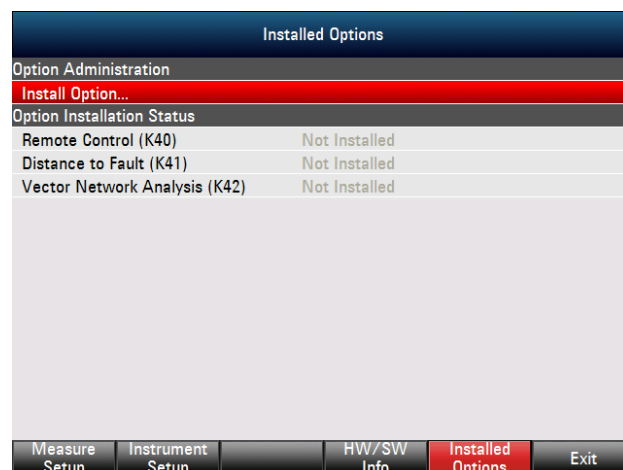
Press the softkey INSTALLED OPTIONS.

Use the rotary knob or the cursor keys to select the INSTALL OPTION... menu item and confirm the entry with the ENTER key.

Enter the key code (32 digit number) for the option with the numeric keys and confirm with the ENTER key.

If the correct key code is entered, the R&S FSH displays "Installation successful", and the option is marked as "Installed" in the option list (example: Remote Control (K40)).

If an invalid key code is entered, the R&S FSH displays "Invalid key code!". The correct key code can then be entered.



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