ROHDE&SCHWARZ

Broadcasting
Division

Handheld TV Analyzer

R&S FSH3-TV

2111.7005.63

Contents

Firmware Version 14.05 ..... **5**
New features 5
Repaired defects 5
Known defects 5
Firmware Version 13.45 ..... **6**
Repaired defects 6
Known defects 6
Firmware Version 13.35 ..... **7**
Repaired defects 7
Known defects 7
Firmware Version 13.25 ..... **8**
New features 8
Repaired defects 8
Known defects 8
Firmware Version 13.15 ..... **9**
New features 9
Repaired defects 9
Firmware Version 13.05 ..... **10**
New features 10
Repaired defects 11
Known defects 11
Firmware Version 12.16 ..... **12**
New features 12
Repaired defects 12
Firmware Version 12.15 ..... **13**
New features 13
Repaired defects 13
Firmware Version 12.05 ..... **14**
New features 14
Repaired defects 15
Firmware Version 10.25 ..... **16**
New features 16
Repaired defects 16
Firmware Version 10.15 ..... **17**
New features 17
Repaired defects 18
Firmware Version 9.25 ..... **20**
New features 20
Repaired defects 20
Firmware Version 9.005 ..... **21**
New features 21
Repaired defects 22

Firmware Version 8.0 ..... **23**
New features 23
Repaired defects 24
Firmware Version 7.20 ..... **25**
New features 25
Repaired defects 25
Firmware Version 7.11 ..... **26**
New features 26
Repaired defects 27
Firmware Version 7.0 ..... **28**
New features 28
Repaired defects 29
Firmware Version 6.2 ..... **30**
New features 30
Repaired defects 30
Firmware Version 6.0 ..... **31**
New features 31
Repaired defects 32
Firmware Version 5.0 ..... **33**
New features 33
Repaired defects 34
Firmware Version 4.3 ..... **35**
Repaired defects 35
Firmware Version 4.2 ..... **36**
New features 36
Firmware Version 4.1 ..... **37**
New features 37
Repaired defects 37
Firmware Version 4.0 ..... **38**
New features 38
Repaired defects 39
Firmware Version 3.02 ..... **40**
Firmware Version 3.01 ..... **41**
New features 41
Repaired defects 41
Firmware Version 3.0 ..... **42**
New features 42
Repaired defects 42
Firmware Version 2.0 ..... **43**
New features 43
Repaired defects 43
Firmware Version 1.1 ..... **44**
New features 44

Repaired defects....44
Installation of New Firmware....45

Firmware Version 14.05

The use of FW version 14.05 is only for FSH3-TV (model 63).
To use firmware version 14.05 with FSH View, at least version 14.0 of FSH View is required.
Do not downgrade to an earlier firmware version after version 14.05 has been installed.

New features

R&S FSH3 firmware

Measurement menu (key MEAS)

- In Isotropic Antenna, transducers of type dBµA/m can be selected.

Bandwidth menu (key BW)

- Added RBW 30 Hz.

Setup menu (key Setup)

- TV Calibration routines were extended to allow for more accurate calibrations.

R&S FSH View software

- Added support for Windows Vista and Windows 7, 32 bits and 64 bits version.
- Added support for Office 2010.
- Added RBW 30 Hz.

Repaired defects

R&S FSH3 firmware

- Remote control command WAIT did not wait for the measurement to be finished when trace mode is average, this has been repaired.
- Remote control command LIMDEF only accepted 24 instead of 25 points, this has been repaired.
- Shoulder attenuation was calculated wrong, this has been repaired.

R&S FSH View software

- Frequency entry for HE300 transducer files was MHz instead of Hz, this has been repaired.
- Frequency entry in transducer editor always changed the frequency value to 1.0219 MHz, this has been repaired.
- RSS files cannot be opened with FSH View version V13.1, this has been repaired.

Known defects

-

Firmware Version 13.45

The use of FW version 13.45 is only for FSH3-TV (model 63).
To use firmware version 13.45 with FSH View, at least version 13.1 of FSH View is required.
Do not downgrade to an earlier firmware version after version 13.45 has been installed.

Repaired defects

R&S FSH firmware

- The Tracking generator Calkit and offset length corrections were not correct. This has been repaired.

Known defects

-

Firmware Version 13.35

The use of FW version 13.35 is only for FSH3-TV (model 63).
To use firmware version 13.35 with FSH View, at least version 13.1 of FSH View is required.
Do not downgrade to an earlier firmware version after version 13.35 has been installed.

Repaired defects

R&S FSH firmware

- Spurious signals have been removed.

Known defects

-

Firmware Version 13.25

The use of FW version 13.25 is only for FSH3-TV (model 63).
To use firmware version 13.25 with FSH View, at least version 13.1 of FSH View is required.
Do not downgrade to an earlier firmware version after version 13.25 has been installed.

New features

R&S FSH firmware

General

- The Marker Peak Search has been enhanced to find smaller relative peaks while 1dB/div scale is selected.
- In case the battery is nearly empty, the instrument indicates this via a blinking battery symbol.
- The Erase All Data function (= pressing the PRESET key for more than 5 seconds) now signals when ready via a message on screen.
- Function Hardware Setup Dynamic Range has been extended by the setting "High Dynamic Range", which increases the RF attenuation from 0 to 10 dB at a reference level above -5 dBm ("Low Noise": above -10 dBm, "Low Distortion": above -20 dBm).
- The Remote Control (FSH-K1 option) command set has been extended with commands to control the Limit Line Beep (LIMBEEP) and the Limit Line Message (LIMMSG).

Repaired defects

R&S FSH firmware

- During remote control the frequency settings on the display were hidden by the Remote Control indicator. Screen positions have been re-arranged to keep the frequency settings visible.
- Occasionally, when starting the Power Sensor Measurement, an error message occurred, although the measurement itself performed fine. This has been repaired.
- With active function Marker Demod the audio signal had drop-outs if the marker position was changed in zero span. This has been repaired.
- Spurious signals have been removed.
- The level display with transducers in unit dBµA/m has been corrected.

Known defects

-

Firmware Version 13.15

The use of FW version 13.15 is only for FSH3-TV (model 63).
To use firmware version 13.15 with FSH View, at least version 13.0 of FSH View is required.
Do not downgrade to an earlier firmware version after version 13.15 has been installed.

New features

R&S FSH3-TV firmware

- Supports new analog TV hardware
- Improved Video Output Level accuracy

Repaired defects

- None

Firmware Version 13.05

The use of FW version 13.05 is only for FSH3-TV (model 63).
To use firmware version 13.05 with FSH View, at least version 13.0 of FSH View is required.
Do not downgrade to an earlier firmware version after version 13.05 has been installed.

New features

R&S FSH firmware

Measurement menu (key MEAS)

- Added Vector Voltmeter measurement
- Tracking Generator
  - Manual RBW available for Vector Calibration
  - Added Calibration Kit correction

Range menu (key RANGE)

- Ranges 0.2 and 0.5 dB/div are added
- Ranges 0..3, 0..30 and 0..300 mRho are added
- Ranges 0..0.3, 0..0.03 and 0..0.003 Rho are added

Marker Mode menu

- Added ‘n dB down’ function
- The Marker display resolution is increased to 0.01 dB.

Amplitude settings

- Keep amplitude settings when switching to other measurements.

Indications and messages

- Warning message is displayed when External Reference is selected and no external reference signal is connected.
- Auto Power Down indication is added when operating on battery.

R&S FSH View software

- The FSH View software has been expanded for all new features in firmware version 13.00.
- Numerical marker positioning is added.
- Frequency count marker is displayed in sweep window.
- Calibration vector or scalar indication is added.
- Black/White print option in preview window is stored.
- Added bridge in status screen.

Repaired defects

R&S FSH firmware

- Occasionally stored datasets are hidden after the instrument has been switched off. This has been repaired.
- The Tracking Generator measurement occasionally left phase screen.
- Marker Time is corrected if a trigger delay is programmed.
- RF Input 75 Ohm correction in DTV is repaired.
- CSO carrier offset remote control command is repaired.
- All CN bandwidths are displayed in the status screen.
- Upon preset, the ATV standard are not reset.
- Remote control CN command FREQ and VISIONFREQ are repaired.
- Settling time of FSH-Z3 bridge is repaired.

R&S FSH View software

- Some RSS files could not be read, this is repaired.

Known defects

-

Firmware Version 12.16

The use of FW version 12.16 is only for FSH3-TV (model 63).
To use firmware version 12.16 with FSH View, at least version 12.0 of FSH View is required.
Do not downgrade to an earlier firmware version after version 12.16 has been installed.

New features

R&S FSH firmware

-

Repaired defects

R&S FSH firmware

- The FSH-Z3 (6GHz bridge) is correctly initialized.
- Spurious signal at 575.893 MHz has been removed.

Firmware Version 12.15

The use of FW version 12.15 is only for FSH3-TV (model 63).
To use firmware version 12.15 with FSH View, at least version 12.0 of FSH View is required.
Do not downgrade to an earlier firmware version after version 12.15 has been installed.

New features

R&S FSH firmware

Measurement menu (key MEAS)

- DTV Receiver
  - Added Remote Control support for querying MER and EVM status. See remote control manual for a detailed specification.
  - Added Remote Control support for querying BER and PER/SER counter. See remote control manual for a detailed specification
  - Enhanced Level Adjust function in case of nearby disturbing signals.
  - Coupled the clamping of MER and EVM measurement values.

Repaired defects

R&S FSH firmware

- Occasionally saved calibration data (Tracking Generator) was invalid after recall. This has been repaired.
- Spurious signal at 2418.75 MHz removed.
- When recalling a Channel Power dataset with transducer enabled the unit of the power measurement was wrong.

Firmware Version 12.05

The use of FW version 12.05 is only for FSH3-TV (model 63).
To use firmware version 12.05 with FSH View, at least version 12.0 of FSH View is required.
Do not downgrade to an earlier firmware version after version 12.05 has been installed.

New features

R&S FSH firmware

Measurement menu (key MEAS)

- Carrier / Noise
  - Added support for user standards
  - Added support for Ratio Channel BW
  - Added support for Noise Floor correction
  - Added support for Zero Span measurement
  - Added support for relative frequency settings in case of Noise measurement
  - Added coupling from CN Reference Channel to CSO/CTB Reference Channel
  - Enhanced Reference measurement value stability and/or step response
  - Added support for manual selection of Peak Power/Channel Power in case of Reference measurement

- DTV Receiver
  - Added Remote Control support for querying the Constellation status. See remote control manual for a detailed specification.
  - Enhanced Level Adjust function in case of nearby disturbing signals.

- Shoulder Attenuation
  - Enhanced Reference measurement value stability and/or step response
  - Added support for Frequency Stepsize functionality

- ATV Receiver
  - Enhanced Level Adjust function in case of nearby disturbing signals.
  - Added Trigger position indicator in ATV-Scope
  - Increased range of all Test Lines
  - Enhanced Reference measurement value stability and/or step response for LumBar, SNR & Vision Carrier measurements
  - Enhanced measurement accuracy by improved inherent noise compensation

- Cable TV (CSO/CTB)
  - Added support for user standards
  - Added support for variable CSO frequency offset
  - Added support for manual Carrier Offset

- Added support for relative frequency settings in case of CSO/CTB measurement
- Added support to disable Noise Correction

Firmware options

- Added indicator (red dot) when Reference Offset is unequal to zero in case of ATV-List, Carrier Measurements, DTV-List & DTV-Constellation measurements
- Consistent frequency range for all ATV- & DTV-Measurements.
- Added support for combined ATV Standards B & G/H including automatic switch
- Default frequency stepsize values according Standard in case of C/N, ATV & DTV measurements
- Added „shortcuts“ in ATV, CN & CSO measurement menus to provide a quick switch between measurements
- Default span is set to AUTO for all TV-Analyzer reference measurements
- Added coupling between Frequency and Channel. When one of both is changed, the other setting will follow.
- Added Remote Control to support switching to Preset settings. See remote control manual for a detailed specification.

Repaired defects

R&S FSH firmware

- Changed TV-Analyzer Reference Measurement settings according User Manual
- In Shoulder Attenuation measurement is was not possible to exit the Channel Table Screen via the EXIT button, this is solved.
- Visible run-in effects for Nicam-BER measurement have been eliminated.
- Remote Control RANGE command was enabled for measurement where it should have been disabled (ATV-List, ATV-Scope, DTV-List & DTV-Scope). This has been solved.
- Time abbreviation in ATV-Scope X-Position was S where it should have been s. This has been solved.
- The marker in ATV-Scope was not always drawn when positioned on the left gridline. This has been solved.
- The marker was displayed on top of the Measurement window when viewing a Dataset in case of HUM measurement. This has been solved.

Firmware Version 10.25

The use of FW version 10.25 is only for FSH3-TV (model 63).
To use firmware version 10.25 with FSH View, at least version 10.1 of FSH View is required.
Do not downgrade to an earlier firmware version after version 10.25 has been installed.

New features

R&S FSH firmware

Firmware options

- Added Remote Control command to get Preselector Calibration result. See remote control manual for a detailed specification.
- Added Remote Control command to get TV Calibration result. See remote control manual for a detailed specification.
- Enhanced ATV-Level-Adjust with fine-tuning steps

Repaired defects

R&S FSH firmware

- Solved memory reset when connecting power adaptor.
  Items that were affected by memory reset:
  - Time reset to factory default
  - Battery indicator reset to empty
  - Tracking generator calibration data lost
  - Last active measurement lost
- Remote Control command to get the modulation depth in Vision Modulation measurement didn't work. This is solved.
- Level Adjust in Carrier Measurements while Preselector connected and set to Filter Path didn't work. This is solved.
- The automatic Power Sensor detection didn't work in some cases. This is solved.
- Dataset memory sometimes not released when deleting datasets. This is solved.
- TV-Calibration didn't work with Bridge Accessory connected. This is solved.
- Tracking Generator datasets were unusable in some cases. This is solved.
- Program default settings (Detector, RBW, VBW & SWT) when leaving ATV-Measurements (Vision Modulation, Carrier Measurements & HUM)..

Firmware Version 10.15

The use of FW version 10.15 is only for FSH3-TV (model 63).
To use firmware version 10.15 with FSH View, at least version 10.1 of FSH View is required.
Do not downgrade to an earlier firmware version after version 10.15 has been installed.

New features

R&S FSH firmware

Measurement menu (key MEAS)

- Channel Power
  - Added availability of Markers
  - Re-enabled Transducers
  - When Transducers are selected the Power Unit is coupled to the Trace Unit.

- Tracking Generator
  - Phase calibration is dynamically corrected in Vector Calibration mode.
  - TG Attenuation resolution improved, 1dB steps now possible.

- Receiver
  - Added AM/FM demodulation

- Analog TV Receiver Carrier Measurements
  - New measurement (Vision & Audio carrier measurements)

- Analog TV Receiver Measurement List / Video Scope
  - Added audio source selection
  - Added specific Group Delay corrections
  - Added trace average for Video Scope
  - Improved level-adjust for ATV-Video Scope.

Trace menu (key TRACE)

- Analyzer
  - Added Mathematical trace function

Range menu (key RANGE)

- Ranges VSWR 1-10 and 1-20 are added.

Setup menu (key SETUP)

- Extended Accessory selection with Preselector
- Extended Hardware Setup with TV Calibration

Firmware options

- Added remote control support for DTV-Shoulder Attenuation, ATV-Vision Modulation, ATV-Carrier Measurements, ATV-HUM Measurement, Cable-CSO, Cable CTB and Preselector. See remote control manual for a detailed specification.
- Remote control command WAIT enhanced. This command now also works with Level Adjust routines and Calibration routines. See remote control manual for a detailed specification.
- Added separate Preselector Attenuation value on display for all measurements.
- Improved copy settings between measurements (do not always switch back to default values when switching between measurements).

R&S FSH View software

The FSH View software has been expanded for new features in firmware version 10.15, including support for the Mathematical function, ATV-Carrier Measurements & Averaging in ATV-Receiver Video Scope.

Repaired defects

R&S FSH firmware

- Sometimes instrument shutdown was not complete. As a result the battery charger did not seem to work correctly. Shutdown behavior is improved.
- Minimized instrument power consumption when instrument is switched off.
- Sometimes Calibration was lost with TG or DTF. This is solved.
- In Measurement Receiver the Quasi Peak detector setting was overruled by coupled settings, as a result the Quasi Peak could no be selected, this is solved.
- ATV measurement results Luminance Bar and S/N sometimes displayed wrong results after restarting the measurement. This is solved.
- After save in ATV-List the measurement stopped running. A temporary workaround was to change measurement settings (e.g. reference level) for a short moment. This is solved.
- The marker sometimes displayed wrong results, when the frequency count marker is enabled and when the FM-demodulation on the marker has been enabled before. It has been fixed and thus will be so. A temporary work-around was to switch the instrument off (not standby, so with no net-adapter connected) and on again.
- Measurement results were incorrect with Preselector connected and unit dBmV, dBµV or V was selected. This is solved.

- Preselector calibration failed when BNC I/O mode was set to External Reference. This is solved.

Firmware Version 9.25

To use firmware version 9.25 with FSH View, at least version 9.2 of FSH View is required.
Do not downgrade to an earlier firmware version after version 9.25 has been installed.

The new R&S FSH3-TV firmware is based on R&S FSH firmware version 9.005. Release history of all previous versions of R&S FSH firmware is included in this document.

New features

R&S FSH-TV firmware

- Support for Preselector has been added.
- Level adjust for ATV-Scope measurement
- Zero span enabled for CSO/CTB measurements
- Improved level adjust routines for CSO/CTB, Occupied Bandwidth, HUM, Isotropic Antenna, Channel Power and Carrier Noise measurements.
- Power measurement accuracy for DTV-List/Scope measurement improved.
- **Preset-key:** It is now possible to delete al internal data by pressing the preset key for at least five seconds.

R&S FSH View software

- Support for new firmware features of version 9.25
- Added units V, W, V/m & W/m^2 for limit lines

Repaired defects

R&S FSH3-TV firmware

- Dynamic range settings kept when switching between measurements
- Bug fixed that caused wrong marker positions and wrong marker value resolutions in ATV-Scope measurement.
- When range RHO or mRHO was selected in Measurement DTF the threshold values were not always correct. This is fixed.

R&S FSH View software

- Improved (cleaned up) CSV files
- Improved sweep/status windows
- Repaired ATV-Scope dataset view

Firmware Version 9.005

To use firmware version 9.005 with FSH View, at least version 9.0 of FSH View is required.
Do not downgrade to an earlier firmware version after version 9.005 has been installed.

The first R&S FSH-TV firmware is based on R&S FSH firmware version 8.0. Release history of all previous versions of R&S FSH firmware is included in this document.

New features

R&S FSH-TV firmware

- When saving or uploading datasets, cable models, limit lines, transducer factors, channel tables and user-defined standards (for OCBW, CHP and TDMA), the full storage space of 2MB can flexibly be shared between the different items.
- Support for the Z3 Bridge has been added.
- Support for Video Triggering has been extended.
- Support for BNC I/O (CCVS & TS-ASI) has been added.
- Support for DTV & ATV standards has been added.

Measurement menu (MEAS key)

Digital TV Receiver (new measurements):
- Measurement List
- Constellation Diagram
- Shoulder Attenuation

Analog TV Receiver (new measurements):
- Measurement List
- Video Scope
- Vision Modulation
- Hum Measurement

Cable TV Analyzer (new measurements):
- CTB
- CSO

Isotropic Antenna (new measurement):
- Isotropic antenna

Tracking generator
- A zoom function for the smith chart has been added.

Power sensor
- Tetra standard for the Z44 has been added.

Channel power
- Power display MAX HOLD has been added.

Range menu (RANGE key)

- Range 0.1 dB/DIV has been added.

- Reflection coefficient ranges have been added.

Marker menu (MARKER key)

- Marker frequency is presented in channel numbers and band names in case the frequency input is set to channels.

R&S FSH View software

- Support for new firmware features of version 9.0.
- Drag and drop for Power Sensor, Receiver (fixed frequency/channel) and Smith Charts measurements has been added.
- Support for up to 10 comm. ports.
- Options to show or hide measurement results and Pass/Fail have been added.
- Column headings for measurement data in CSV file (and for drag and drop to other applications) have been added.
- Transducer files for FSH-Z38 matching pad have been added.

Repaired defects

R&S FSH-TV firmware

- When the rotary knob was used to change the span in case a small spans was already active, the center frequency was unnecessary changed. This has been fixed.
- The result of the frequency counter marker was not always displayed in the correct precision. This has been fixed.
- In the receiver mode, some signals where indicated though they where not physically present. This has been fixed
- If audio demodulation on the marker was enabled and the instrument was switched off and on again, the audio demodulation did not work properly. This has been fixed.

R&S FSH View software

- Problems with selecting limit lines from the Sweep Settings dialog and previewing limit lines from the Limit Line Editor have been fixed
- It was possible to copy zero-span and non-zero-span TG traces into same Sweep window. This has been fixed.

Firmware Version 8.0

To use the firmware version 8.0 with FSH View, at least version 8.0 of the R&S FSH View software is required.
Do not downgrade to an earlier firmware version after version 8.0 has been installed.

New features

R&S FSH firmware

- A pool of 100 stores is used for uploading Cable models, Limit lines, Transducer factors, Band tables, OCBW standards, CHP standards and TDMA standards

Setup screen (SETUP key)

- The status of additional options is displayed in the setup screen

Measurement menu (key MEAS)

- Added the Carrier/Noise measurement

Tracking generator
- Limit lines with range VSWR can be uploaded
- Phase calibration is dynamically corrected in Vector Calibration mode on models 26
- TG Level is controlled with an attenuator setting instead of the absolute level

Distance to Fault
- Limit lines with range VSWR can be uploaded
- Minimum user span is decreased to 10 MHz

Power sensor
- Power sensor Z14 supported
- Peak Envelope Power and Reflected Power measurements supported for Z14 and Z44

Channel Power, Occupied Bandwidth and TDMA Power
- Customized user standards can be uploaded

Trace menu (key TRACE)

- Trace averaging over N traces is possible now. The user can specify N in the range of 2...999

Marker menu (key MARKER)

- Search range for marker for marker commands like PEAK, NEXT PEAK, MINIMUM can be specified by the user

Span menu (key SPAN)

- Minimum span is decreased to 100 Hz

R&S FSH View software

- Support for new features of firmware version 8.0.
- Multiple instances of FSH View can be started
- Marker values for all traces in a sweep window are displayed
- Marker control functions (peak, next peak and minimum) added
- Limit search range for marker peak added
- Drag and drop of sweeps between 2 instances of FSH View
- Automatic file conversion between different file formats of FSH View

Repaired defects

R&S FSH firmware

- In Tracking Generator spikes where visible in the frequency range of 3 to 6 GHz that where related to the sweep time. This has been fixed

R&S FSH View software

- Crashing when control dialogs where resized has been fixed
- Crashing when trying to zoom in on Power Sensor or Receiver mode has been fixed
- The incorrect handling of all-invalid traces in CSV files has been fixed
- Incorrect formatting of trace blocks when 4 sweeps are displayed in 1 window has been fixed
- Incorrect marker movement by cursor keys when 2 or more Channel scans are displayed in 1 window has been fixed
- Selection of range Linear was not possible in Receiver mode. This is fixed.
- Error handling of CSV files is corrected
- Frequency offset is taken into account for the start and stop frequency

Firmware Version 7.20

To use the firmware version 7.20 with FSH View, at least version 7.0 of the R&S FSH View software is required.
Do not downgrade to an earlier firmware version after version 7.20 has been installed.

New features

R&S FSH firmware

None

R&S FSH View software

None

Repaired defects

R&S FSH firmware

- In firmware version 7.11 the measurement with the Smith Chart display showed wrong phase values. The bug is fixed with firmware version 7.20. Earlier firmware versions measure correctly.

R&S FSH View software

None

Firmware Version 7.11

To use the firmware version 7.11 with R&S FSH View, at least version 7.0 of the R&S FSH View software is required.
Do not downgrade to an earlier firmware version after version 7.11 has been installed.

New features

R&S FSH firmware

Sweep time (SWEEP key)

- Using video bandwidths ≤ 1 kHz, the minimum sweep time settings can be approx. twice as fast (using MANUAL SWPTIME).

Saving data sets (SAVE key)

- When saving a data set, you can edit the default data set name by using the UP/DOWN keys as cursor keys:

Receiver mode (MEAS key)

- By toggling between the different modes (FIXED FREQ ↔ FREQ SCAN and ANALYZER ↔ RECEIVER), you can maintain the scan start and scan stop frequencies.
- With the RBW setting AUTO CISPR dependent on the current frequency, the R&S FSH automatically uses the CISPR resolution bandwidth (RBW 200 Hz for freq. < 9 kHz, RBW 9 kHz for freq. of 9 kHz to 30 MHz, RBW 120 KHz for freq. of 30 MHz to 1 GHz, RBW 1 MHz for freq. > 1 GHz).

Distance-to-fault measurement (MEAS key)

- As an alternative to the settings CENTER and SPAN, you can input the start and stop frequencies with distance-to-fault measurement. The start and stop frequencies are also shown on the display.

R&S FSH View software

- If a CISPR RBW is selected in receiver mode, the bandwidth display in the status box is marked with 'CISPR'.
- The instrument model number is shown in the status box together with the serial number.

Repaired defects

R&S FSH firmware

- If an active limit line was partially shifted out of the display range (e.g. by changing the reference level or display range), parts of the limit line were folded back into the display. This has been fixed.
- With a frequency or channel scan in receiver mode, the marker showed the pixel frequency instead of the measured frequency in firmware version 7.0. This has been fixed.

R&S FSH View software

- RBW values were displayed erroneously in the sweep window if CISPR RBW was selected in receiver mode.
- Resizing the control dialogs (Data Set, Cable Model, Transducer, Limit Lines, Channel Table) is now limited to a minimum size. In previous versions, downsizing the control windows could force R&S FSH View to terminate.
- Incorrect marker movement by cursor keys when a window contained two or more channel scans has been fixed.
- When using CTRL-TAB (Next) with a maximized sweep window, the sweep window could be blanked out. This has been fixed.

Firmware Version 7.0

Firmware version 7.0 also supports the new models 1145.5850.06 and 1145.5850.26 of the R&S FSH. To use the firmware version 7.0 with FSH View, at least version 7.0 of the R&S FSH View software is required.
Do not downgrade to an earlier firmware version after version 7.0 has been installed.

New features

R&S FSH firmware

Frequency menu (key FREQ)

- As an alternative to frequency input, channel numbers can be input using channel configurations defined via FSH View (more complex channel configurations) or via the front panel (one simple channel configuration). Channel input is switched on in the menu CF STEPSIZE.

Trace menu (key TRACE)

- When the detector is in coupled mode, the AUTO PEAK detector is used when the CLEAR/WRITE trace mode is active.

Amplitude menu (Key AMPT)

Tracking generator

- The softkey REF OFFSET has been renamed to REF POSITION.
- Added the softkey TRACE OFFSET to compensate for a fixed attenuation or gain.

Measurement menu (key MEAS)

- Added the option Receiver Mode (option R&S FSH-K3).

Tracking generator

- The user interface for operating the tracking generator has been changed. When the option FSH-K2 is installed, the vector transmission or reflection measurement is selected in a separate menu (softkey MEAS MODE in the tracking generator menu). Also, the cable loss measurement function is switched on in the menu MEAS MODE.
- Changed user interface for cable loss, now in TG button bar.

Setup menu (key SETUP)

- The preset setting can now be customized. A stored data set can be defined as the preset setting by using FSH View. The use of the custom preset setting is switched on in the GENERAL menu item PRESET SETTINGS: DEFAULT or CUSTOM.
- Added 9600 baud in SERIAL BAUDRATE menu.
- Added selection of dynamic range HARDWARE SETUP menu.

The remote control commands have been expanded for new features in firmware version 7.0; see remote control manual.

R&S FSH View software

- Support for new features of firmware version 7.0.
- Support for R&S FSH6 models 1145.5850.06 and 1145.5850.26.
- Support of serial interface baud rate 9600
- Added auto-save function with “multiple transfers”.

Repaired defects

R&S FSH firmware

None

R&S FSH View software

The vector traces were incorrectly loaded from .rss files. The software crashed when loading files with a tracking generator memory trace included. This has been solved in FSH View V7.0.

Firmware Version 6.2

Operating the R&S FSH3 with firmware version 6.2, version 6.0 of the R&S FSH View software is required.

New features

None

Repaired defects

SAVE/RECALL

- When scrolling the data set preview window the firmware crashed. This has been fixed now.

STATUS screen

- The status of the external reference has not been updated correctly in the status screen.

Limit Lines

- In Tracking Generator mode limit lines have not been shown on screen. Only pass or fail information has been output. This is fixed now.

UNITS

- With the unit V/m the numbered values for the marker output always showed the unit V/m. Dependent on the measured value the unit changes to mV/m or µV/m.

Noise Floor

- The noise display with specific spans and sweep times has been increased. This has been resolved.

Reflection measurement with option FSH-K2

- In firmware 6.0 the reflection measurement the dynamic range in vector mode (option FSH-K2) has been decreased compared to firmware version 5.0. Firmware 6.2 fixes the problem.

Distance to Fault measurement

- The auto sweep time in DTF mode is increased to avoid ghost reflections.
- The value of the measured reflection in DTF mode has been dependent on the set center frequency. With firmware version 6.0 it is independent of the center frequency.

Firmware Version 6.0

To use the new features of firmware version 6.0, version 6.0 of the R&S FSH View software is required.

Do not downgrade to an earlier firmware version after version 6.0 has been installed.

New features

R&S FSH3 firmware

Amplitude menu (key AMPT)

- With option R&S FSH-K2 installed a Smith Chart display is added for reflection measurements (menu AMPT: RANGE).

BW menu (key BW)

- Resolution bandwidths 100 Hz and 300 Hz are added with model 1145.5850.03

Trace menu (key TRACE)

- The coupling between trace mode and detector can be switched on or off in the menu TRACE: DETECTOR.

Frequency menu (key BW)

- For the frequency offset also negative values are allowed.

Measurement menu (key MEAS)

Channel Power / Occupied Bandwidth / TDMA Power

- The selection of the transmission standard is retained when changing to a different mode.
- The standard USER can be renamed to a user specific name.
- With Channel Power measurements a minimum channel bandwidth of 834 Hz corresponding to a span of 1 kHz is allowed (only model 03 and 23).
- With Channel Power and Occupied Bandwidth measurements the span can be increased up to ten times the channel bandwidth (softkey MANUAL SPAN and AUTO SPAN in span menu added).

Distance to Fault Measurement

- Selection of the frequency range used for DTF measurement is possible now. In span menu the softkeys MANUAL SPAN and AUTO SPAN are made available for setup.

Tracking Generator

- One Port Cable Loss measurement function has been added with vector reflection measurement. (requires FSH-K2, not yet supported in FSH View). It is switched on in the AMPT menu (softkey TG MODE).

Marker menu (key MARKER)

When changing back and forth the measurement mode the former marker settings will be restored.

Setup menu (key SETUP)

Hardware Setup softkey

- Added preamplifier control also for model 03 for serial numbers beginning with 101362 (softkey HARDWARE SETTINGS).

R&S FSH View software

- Support for new features of firmware version 6.0;
  Detector coupling, Smith Chart.
- The One Port Cable Loss Measurement is not supported yet in FSH View V6.0.
- Added Display line
- Added control to pre-view Limit Lines
- Added control exchange Limit Lines in rss files.

Repaired defects

R&S FSH3 firmware

When leaving the Distance to Fault measurement (in firmware version 5.0) via the measurement menu the phase was still measured (although not used). This doubled the sweep update. This problem is solved in firmware version 6.0.

In the Power Sensor Measurement the prefixes k an M were missing. This is solved in V6.0.

The menu item ZOOM OFF was not green is when ZOOM OFF was selected. In firmware version 6.0 the ZOOM OFF menu item becomes green.

R&S FSH View software

None

Firmware Version 5.0

To use the new features of firmware version 5.0, version 5.0 of the R&S FSH View software is required.

Do not downgrade to an earlier firmware version after version 5.0 has been installed.

New features

R&S FSH3 firmware

Amplitude menu (key AMPT)

- With option R&S FSH-K2 installed, the VSWR ranges 1 to 1.5 and 1 to 1.1 are added for reflection measurements (menu AMPT: RANGE).

Sweep time menu (key SWT)

- The minimum sweep time is now 20 ms (instead of 100 ms).

Bandwidth menu (key BW)

- Added RBW 200 kHz (only available via numerical keypad).

Measurement menu (key MEAS)

Tracking generator

- With scalar transmission or reflection measurements, the calibration data is now saved with a data set.

Distance-to-fault

- A cable model at a single frequency can be defined by direct entry via the front panel of the R&S FSH3.
- Multimarkers are also available with distance-to-fault measurements.
- Distance-to-fault measurements are performed using amplitude and phase information. With earlier firmware versions, only amplitude information was used.
- Calibration data is now saved in the R&S FSH3 memory to avoid a new calibration when the instrument settings are changed.

Power sensor

- Support for the Directional Power Sensor R&S FSH-Z44 has been added.

Marker menu (key MARKER)

- In addition to PEAK, NEXT PEAK, CENTER = MKR FREQ and REF LVL = MKR LVL in the SET MARKER menu, MINIMUM has been added.

Remote control

- The following commands have been added:
  - GET CTRACE, GET CTRACEBIN
    (read-out of the complex trace data with vector transmission or reflection measurements)
  - CMD MARKERMIN
    (set marker to trace minimum)
  - SET AUTORBW, SET AUTOVBW, SETAUTOSWPTIME
    (set RBW, VBW or SWEEP TIME to auto-coupling)
- The Directional Power Sensor R&S FSH-Z44 is supported.
- Status Byte (read-out of instrument status which may cause measurements to be questionable (e g. uncoupled settings))

Transducers

- The unit V/m has been added.

Data sets

- The active limit lines, transducer factors and/or cable models are now stored along with data sets instead of only their names.

R&S FSH View software

- Support for new features of firmware version 5.0.
- Support of serial interface COM 5 for controlling the R&S FSH3.
- Multimarkers have been added for analyzing measurements.
- The Word macro FSH Report now allows sweep window files (.rss files) to be imported.

Repaired defects

R&S FSH3 firmware

Measurement menu (key MEAS)

- With distance-to-fault measurements and transmission or reflection measurements, the R&S FSH3 erroneously indicated a valid calibration. This has been fixed.

Marker menu (key MARKER)

- With SET MARKER: PEAK, the marker was not positioned to the peak of the trace in the case of low signal peaks. This has been fixed.

Remote control

- Solved long response time when many incorrect commands are sent.
- WAIT: Using the WAIT command to synchronize on end of sweep did not work correctly for short sweep times. This has been fixed.

Firmware Version 4.3

Do not downgrade to an earlier firmware version after version 4.3 has been installed.

Repaired defects

R&S FSH3 firmware

- Improved AM demodulation.

Firmware Version 4.2

Do not downgrade to an earlier firmware version after version 4.2 has been installed.

New features

R&S FSH3 firmware

Setup menu Display type B/W or Color has been added to the setup menu.

Firmware Version 4.1

Firmware version 4.1 supports the permanent storage of data sets, cable models, limit lines and transducer factors independently of the battery charge status.
In addition, it provides text messages instead of numbers when operated in the Power Sensor mode.

To use the new features of firmware version 4.0 or 4.1, version 4.0 of the R&S FSH View software is required.

Do not downgrade to an earlier firmware version after version 4.1 has been installed.

New features

R&S FSH3 firmware

Marker menu

In the Multi Marker mode, the function 'All Markers ON' is added for both the Marker and Delta Marker menu.

Repaired defects

R&S FSH3 firmware

- Added a green bar in the Date Format menu for indication of the current setting.
- Minimum frequency setting for Power Sensor changed to 10 MHz instead of 10 Hz.
- When the instrument was switched on after it had been switched off with the AM demodulator active, the IF filter was not programmed correctly. This resulted in a noisy display.
  This has been fixed.

Firmware Version 4.0

Firmware version 4.0 supports model 1145.5850.23 of the R&S FSH3 and the 18 GHz Power Sensor R&S FSH-Z18. To use the new features of firmware version 4.0, version 4.0 of the R&S FSH View software is required.

New features

R&S FSH3 firmware

Firmware options

Added Remote Control (R&S FSH-K1) via the optical RS-232 interface.

Bandwidth menu (key BW)

Added 100 and 300 Hz resolution bandwidth (model 1145.5850.23 only).

Trace menu (key TRACE)

With trace mode Min Hold, the Min Peak detector is selected as the default detector.
With trace mode Max Hold, the Max Peak detector is selected as the default detector.

Measurement menu (key MEAS)

Tracking generator

- The tracking generator output level is switchable between 0 dBm and –20 dBm (model 1145.5850.23 only).

Power sensor

- Support for R&S FSH-Z18 up to 18 GHz.

Added **Occupied Bandwidth** measurement.

Distance to fault

- In addition to return loss, VSWR is available for display of cable faults (key AMPT, softkey UNIT).
- Insertion loss of the R&S FSH-Z2 is taken into account when displaying spectrum in Distance to Fault mode.

Marker menu

The number of markers has been increased to six (Multi Marker mode).

Setup menu

The setup menu has been rearranged to support new functions.

Added Hardware Setup softkey

- Added preamplifier control (model 1145.5850.23 only).
- BNC input connector can be switched between external trigger input and external reference input (applies to instruments from serial number 100466 (model 1145.5850.03) and serial number 100938 (model 1145.5859.13)).

Moved the Power Down function to General softkey menu.

Messages

When switching off the instrument when the battery charge is low, the R&S FSH3 issues a warning to save the data sets or to load the battery.

R&S FSH View software

- Support for new R&S FSH3 firmware version 4.0 features.
- The supplied Word Macro ‘FSH Report’ can also read data sets stored on the PC hard disk.
- Added input of relative velocity for cable parameters.

Repaired defects

R&S FSH3 firmware

- Solved slow startup after off/on while vector calibrated in TG measurement.

R&S FSH View software

- Solved bug in reading back data sets including transducer factors exported in csv format.
- Solved bug with readout of measurements using the power sensor.

Firmware Version 3.02

Firmware version 3.02 supports a new hardware release of the digital board of the R&S FSH3. No new functions or repairs are implemented in this firmware version.

Firmware Version 3.01

To use the new features of firmware version 3.01, version 3.0 of the R&S FSH View software is required.

New features

R&S FSH3 firmware

- None

R&S FSH View software

- None

Repaired defects

R&S FSH3 firmware

Tracking generator

- The auto sweep time in the tracking generator mode has been modified for accurate results.

Recall function

- When the status display is viewed in the recall mode, the rotary knob browses through the stored data sets and the cursor keys scroll through the setting table of the status screen.

- The counter frequency is now shown when the test results of stored data sets are viewed. This value was missing in the previous versions.

R&S FSH View software

- None

Firmware Version 3.0

To use the new features of firmware version 3.0, version 3.0 of the R&S FSH View software is required.

New features

R&S FSH3 firmware

Frequency menu

- Frequency offset (up to 100 GHz) added.

Measurement menu (MEAS)

Tracking generator

- Vector transmission and reflection measurement added (Option R&S FSH-K2, for instruments with tracking generator and serial numbers greater than 100523).

Power sensor

- Resolution of power level read-out increased to 0.01 dB.

Distance to fault

- Resolution of distance to fault (DTF) measurement increased from 301 points to 1024 points.
- Zoom function added to marker menu (softkey ZOOM FACTOR).
- Feet added as unit to the distance to fault display (menu SETUP: LOCAL SETTINGS: UNIT OF LENGTH).

Channel power

- dBmV and dBµV added as units to the PWR UNIT menu (in addition to dBm).

Amplitude menu

- 1 dB/DIV added for level resolution (menu AMPT: RANGE).

R&S FSH View software

- Support of new features in firmware version 3.0.

Repaired defects

R&S FSH3 firmware

- None

R&S FSH View software

- Error when reading cable model files with MS Windows French region settings corrected.

Firmware Version 2.0

To use the new features of firmware version 2.0 version, version 2.0 of the R&S FSH View software is required.

Do not downgrade to version 1.1 or 1.0 after version 2.01 has been installed, because the factory adjustment parameters of the display will be lost.

New features

R&S FSH3 firmware

Trace menu

- MIN PEAK detector added.
- MIN HOLD and VIEW added in trace mode.

Measurement menu (MEAS)

- Display line added.
- Limit lines added.
- Transducer factors added.

Status screen (STATUS)

- RF attenuator setting information added.
- Scroll bar added.

R&S FSH View software

- Limit line editor and control added.
- Transducer factor editor and control added.
- Capability to open and store data sets from the R&S FSH3 (*.rsd) files in graphics or text format added.
- Microsoft Word macro for generating test reports added.

Repaired defects

R&S FSH3 firmware

- Spurious signal that occurred when applying an input signal at 402 MHz removed.

R&S FSH View software

- None

Firmware Version 1.1

New features

- None

Repaired defects

- Measurement time for the Power Sensor R&S FSH-Z1 corrected (in firmware version 1.0, the settling time for the measurement result was too long).
- Frequency input for the power sensor increased to 8 GHz.
- Internal memory content with low battery repaired (in firmware version 1.0, a low battery can cause unpredictable memory content, thus preventing correct loading of the battery).

Installation of New Firmware

The new firmware for the R&S FSH is packed in the executable file “FSH3 TV Vxx.xx.exe”.

- Store this file in a separate directory on your PC or laptop.
- Connect the R&S FSH to an available USB/COM port on your PC or laptop using the optical interface cable.
- Operate the R&S FSH from the AC mains power supply. Operation from battery does not allow the firmware to be updated.
- Switch on the R&S FSH.
- Store all data sets, cable models, transducer factors and limit lines in the R&S FSH on your PC or laptop using the R&S FSH View software. Otherwise, this information will be lost after the firmware is updated.

  Installed firmware options are not affected by a firmware update.
- Run “FSH3 TV Vxx.xx.exe”.
- The program will start and guide you through the installation process.
- After the firmware update is finished, download the data sets, cable models, transducer factors and limit lines from your PC or laptop to the R&S FSH.

Note: *If the firmware installation does not work properly, set the baud rate for the serial port transmission to a lower rate and try again. The maximum baud rate is dependent on the driver capability of the COM port of the PC that is used.*

The battery charge level indication shows a flat battery after a firmware update. The correct charge level indication will be available after the battery is fully charged for the first time after the firmware update.