



**ROHDE & SCHWARZ**

Radiomonitoring and Radiolocation  
Division

## **Release Notes**

## **Firmware V4.30**

## **R&S<sup>®</sup> EM100**

**4070.4200.02, 4070.4800.02**

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# 1 General Information

This new firmware version V4.30 corresponds to the following software and manual versions:

- EM100 Operating Manual “4070.4275.02/03 - 04”.
- PRView V4.0.3
- EM100Control V5.4.1.11979
- ARBToolbox Plus V1.7.0

## 2 Firmware Update

### 2.1 Update preparations

#### Stop running scans

A running scan will severely delay downloading of upgrade files (see below), so the user should first stop any running scans by using SCPI commands ABORT or \*RST.

#### Format storage card

Use the SCPI command: MMEM:INIT to format the SD-Card to make sure it is empty.

SD card formatting in the R&S® EM100 is also required to prepare for high-performance recording. Note that this step is not required, if you do not intend to use the Internal Recording Option.

### 2.2 Firmware update from SD-card

This method is not convenient for the R&S® EM100, as it requires physical access to the SD card, which requires disassembly of the receiver housing.

- Copy the files from Target\SD\_card to the root of the SD-card:
  - bootloader\_MR\_V4\_30.bin
  - flashfilesystem\_MR\_V4\_30.bin
  - osimage\_MR\_V4\_30.bin
  - updater\_MR\_V4\_30.bin
  - cploadfiles\_MR\_V4\_30.bin
  - splashscreen\_EM100.bmp
- Insert the SD-card in the R&S® EM100.
- Establish a TCP connection to the EM100 and issue the SCPI command SYSTem:FIRMWare:UPDate
- Wait for 5 minutes, then read the new firmware version with SCPI command \*IDN?

**IMPORTANT:**

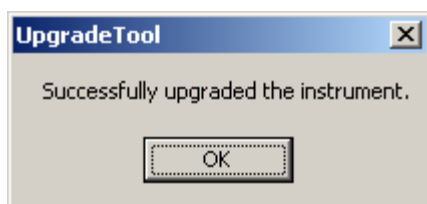
DURING FIRMWARE UPGRADE, DO NOT TURN OFF THE R&S® EM100.

## 2.3 Firmware update by Firmware Upgrade Tool

Firmware after version 1.21 is bundled with the Firmware Upgrade Tool, which allows a firmware upgrade over LAN without physical access to the SD card. This is convenient for EM100.

Before starting the upgrade, make sure that the R&S® EM100 is connected to power and that a SD card is inserted. Check that the R&S® EM100 can be contacted via LAN from the PC.

Start the Upgrade Tool “RS\_PR\_MR\_V4\_30.exe” and follow the instructions on the PC screen. Do not switch off the PC or the receiver until upgrading is complete. The successful message is shown below.



### Please note :

The Firmware Upgrade Tool does not work if firmware 1.21 or below is installed on the R&S® EM100. In this case you will need a special software tool to prepare the firmware upgrade over LAN. Please consult R&S® support or your local R&S® representative to obtain this tool.

## 3 Remote Connections

Establishing and using the remote connection to the EM100 is described in the Operating Manual on the CD.

## 4 New Features/Changes in this Release

See the change history for the complete list of changes.

### 4.1 EM100-DF Software Option

EM100-DF software option is officially released.

Refer to the operating manual for the full list of SCPI commands related to direction finder.

Users can create, edit, upload and download DF antenna correction set data from the instrument using PRView V4.02 and above.

### 4.2 New Demodulation Type

“PM” demodulation type is added.

### 4.3 DF Mode – Internal Recording

In DF mode, internal recording of Audio, Audio SQL and Trace are supported. IQ recording is not supported in DF mode.

Note: Requires DF and IR options

### 4.4 Antenna list changes for ADD107 and ADD207

ADD107 and ADD207 DF antennas are added to the antenna list.

**IMPORTANT:**

**You need to perform a factory reset (syst:preset:factory) in order to see these antenna list changes.**

**NOTE that a factory reset will clear the device’s memory lists, antenna lists, suppress lists, user presets, user kfactor tables and correction sets on the device.**

### 4.5 SCPI Command Changes

- **SYSTem:DECLination?**  
- Query the currently used magnetic declination value.
- **SYSTem:ANTenna:USED?**  
- Query the name of the antenna used

## 5 Known Bugs / Limitations

None

## 6 Change History

### V4.30

- Added: Direction finder software option EM100-DF.
- Added: PM demodulation type.
- Added: Internal recording in DF mode supports only Audio, Audio SQL and Trace.
- Added: ADD107 and ADD207 DF antennas added to the antenna list.
- Added: SCPI command "SYSTEM:DECLination?", "SYSTem:ANTenna:USED?"
- Bugfix: GPSCompass UDP stream incorrectly used negative LAT/LON values when the GPS Longitude Reference is WEST or the GPS Latitude Reference is SOUTH. It has been corrected to use positive LAT/LON values.
- Bugfix: GPS PDOP data in the DF UDP stream was always zero.
- Bugfix: "system:compass:data?" returned heading type which is different from the GPSCompass UDP stream.
- Bugfix: TRAC:UDP? Query with invalid client number was returning an inappropriate error code.

### V4.20

- Changed: Default folder name on the SDCard is now EM100.
- Added: SCPI command to provide SCPI-compatibility with ESMD/EB500:  
[SENSe:]FREQuency[:CW|FIXed]:RANGe:HF[:UPPer] <receive\_frequency>
- Bugfix: PSCAN speed was limited to about 1.72GHz/s. PSCAN speed is in this release is now 1.8GHz/s.
- Bugfix: If the SD card is write-protected, the mmem:init command would cause the SD card to be unmounted.

### V4.11

- Bugfix: Resolved stability issue on newer hardware revisions where the device might hang after extended periods of continuous usage. Downgrading to lower firmware versions is no longer possible after updating to this firmware version.

### V4.01

- Added: Local Date, Local Time and Timezone.
- Added: Time Synchronisation via GPS.
- Added: Time Synchronisation via NTP.
- Added: Voice Inversion Descrambling.
- Added: Audio Notch Filter.
- Added: Magnetic Declination support.
- Changed: Maximum internal recording memory size reduced to 52MB.
- Added: External Reference Lock check.
- Changed: Improved SCPI command response when the system is under heavy load.
- Changed: During IFPan streaming or internal trace recording, 1601 level values will be streamed/written compared to 1599 values in previous versions.

### V3.10

- Changed: Different start-stop frequencies for PSCAN and FSCAN.

- Changed: SCPI:IF-stream Attenuation value. Now the correct attenuation value is filled in the IF stream in case of manual gain. This solves the problem that the attenuation value is set always to 0.
- Changed: SCPI sens:freq start / stop min and max values shall depend in the installed options and selected antenna.

### V3.00

- Added: GPS-Compass option.
- Changed: Maximum internal recording memory size reduced to 56MB.
- Bugfix: When a query from one SCPI client is pending in a transaction (e.g. SENS:DATA? "VOLT:AC"), a query from a second SCPI client is accepted as part of the ongoing transaction and handled.
- Bugfix: SCPI command SENS:DATA? "VOLT:AC" freezes UI.
- Bugfix: DataSize field in the common header for IF (IQ) streaming was not correctly filled.
- Bugfix: Audio Stream hick-up and slow recovery (5s).
- Bugfix: Slow startup of instrument with large memory-lists.

### V2.21

- Bugfix: V2.20 did not support the new flash.

### V2.20

- Added: Periodic measuring mode for IF-PAN traces.
- Bugfix: Equal filling of Itrace/Mtrace when using SCPI.
- Bugfix: Combinations of the short-form and long-form of "FREQuency":OFFSet" was not accepted

### V2.10

- Added: External triggered measurement software option.
- Added: Timestamps added in the data streams and replay trace.
- Added: IP gateway functionality.
- Bugfix: IQ stream zero value at center frequency.
- Changed: MSCAN points are skipped if their antenna is not in the "included" state on the antenna list.

### V2.00

- Added: Internal recording software option
- Additional IF-Bandwidths (SPAN): 5kHz, 2kHz and 1kHz
- Overlapping FFT's engaged with small IF-Bandwidth for quick display update
- Hostnames with serial number implemented.
- Default fixed IP-address : 172.17.75.1
- Added: SCPI:
  - Trace:Record:xxx
  - Trace:Replay:xxx
  - UDP stream for Audio added
  - Timestamps in trace streams IFPan and Pscan added
- Bugfix: Bug "Corrupt internal File System"
- Bugfix: When inserting and removing SD card, the system freezes for several seconds.

### V1.21

- First version.