Newsletter

EMC32

Version 6.10

1 Scope

This document gives an overview of the additional features that are implemented in
since version 5.20 (EMI) and version 6.0 (EMS):

- EMC32-E/E+

- EMC32-S

- EMC32-K1,K2,K3,K4,K6,K7

- IMS OS Software

Subject to change

2 Product Overview

With EMC32 V6.x the software packages EMC32-C, EMC32-A/A+ and EMC32-W+ are not supported anymore. Refer to the cross reference table below to find the appropriate main applications and options which replace your V5.x product.

EMC32 V5.x Product	EMC32 V6.x Product + Options
EMC32-S	EMS32-S EMC32-U6
EMC32-C	EMC32-E EMC32-S EMC32-U6
EMC32-A	EMC32-E EMC32-S EMC32-K1 EMC32-U6
EMC32-A+	EMC32-E EMC32-E Plus Extension EMC32-S EMC32-K1 EMC32-U6
EMC32-W+	EMC32-E EMC32-E Plus Extension EMC32-S EMC32-K2 EMC32-U6
EMC32-E	EMC32-E
EMC32-E Plus	EMC32-E EMC32-E Plus Extension

Any upgrades for **EMC32-S** (susceptibility section) from software versions older than **V6.0** requires an upgrade package **EMC32-U6** which you can order contacting your R&S sales representative.

3 Main Program

3.1 EMC32 File System Structure (already included in V6.0; now also for EMI)

The following changes in the data module which manages the file access of EMC32 have been implemented:

TESTS subfolders:

- EMC32 will not create anymore subfolders in the Tests folder structure which indicate the type of the measurement (EMS/EMI radiated/conducted).

SYSTEM subfolders:

- For the following file type's subfolders are now supported:

  - EUT Information
  - Frequency Lists
  - Graphics
  - Limit Lines
  - Reference Calibrations
  - Report Setups
  - Tables
  - Test Templates

- Limit line and Reference Calibration files are not anymore sorted by fixed subfolders (EMI/EMS radiated/conducted).

Attention:

Take care when you change the location of files since these files may be referenced by other files like test templates or tests. The EMC32 file system cannot be downgraded to version < V6.x since the new subfolder structure for the System folder is not supported there.

EMC32 supports now also to use different locations for the program files folder and for the EMC32 data folders during the installation (refer to the installation guide for further information).

3.2 Main Menu (already included in V6.0; now also for EMI)

The main menu structure has been revised as follows to achieve a more intuitive relation:

- All functions to create a new test, open an existing test or saving a test have been moved to the Test menu.

- New or existing report setups can be opened via the report menu.

- The option dialog has been split into sections which are now accessible via the Extras >> Option submenu.

3.3 Report Functions (already included in V6.0; now also for EMI)

The report module in EMC32 V6.x has been completely revised. The following new functions have been implemented:

- A new file type "Report Setups" is now available in the SYSTEM folder as well in the test folder structure. It stores now the complete structure of a report setup (similar to *.dot files in MS Word).

- A report setup file can be assigned to a test when newly created. In existing tests more than one report setup can be created for handling different report layouts. Report setups can be as well imported from the global system folder to the test folder or vice versa.

- The font type and size of the report components can now be changed in the option menu. This allows for example to reduce the size of result tables.

- More than one graphics block (component) can now be handled in the report.

- Images in the format JPEG or TIF can now be added to a report. Therefore it is easy to also add a photograph of the test setup or of the DUT.
  This feature can be used as well to assign a company logo on the first page of the report.

- Text blocks can now be added to the report.

- New page sections for changing the page orientation of the consecutive pages.

3.4 Extensions

The following software extensions have been implemented:

- Table Editor
  A new main menu entry and button in the table toolbar allows to copy the complete contents of the table into the clipboard (including the row headers) for the transfer into other applications.
  Split EMI tables only support the currently visible part of the complete table in the editor.

4 EMI Section

4.1 Report

The following has been added for enhancing reports from EMI tests:

- Single Measurement Results:
  In scan templates it is possible to de-activate certain additional columns (like e.g. 'Bandwidth' or 'Meas. Time') which will automatically hide those columns in the result tables.

- Layout:
  In a 'Report Setup' it is possible to pre-define which results from a test (e.g. Single Measurement Results') or from an Autotest (e.g. 'Final Measurements') shall appear in the report.

- Autotest Template:
  In a report the 'Autotest' template will optionally also show the basic settings of the referred scan / sweep templates.

4.2 Fixed Problems

The following problems have been removed in the EMI section:

- Single Measurement:
  If no measurement had yet been done, then the feature "Upload Frequency" could fail, - depending on the latest setting of the instrument

- Scans:
  The overloads with ESPI, ESCI and ESU were not indicated correctly.

- Auto test templates for 'MIL-STD 461 C':
  If a NB/BB discrimination was activated, then changes to the settings for the 'Acceptance Analysis' were not stored.

- Auto tests for site attenuation measurements ('NSA'):
  An newly created reference measurement result could not automatically be used for a consecutive test. Now the result will always be copied into the global folder 'Tables'.

5 EMS Section

5.1 New EMC32 Options

- **EMC32-K2 now available:**
  The option EMC32-K2 supporting the EMC measurement functionality "audio break through" and "spurious emissions" according to the corresponding wireless standards is now available.

- **EMC32-K6 now available:**
  The option EMC32-K6 supporting the intermodulation EMS measurement according the MIL standard 461E CS103, CS104, CS105 is now available.

- **EMC32-K7 now available:**
  The option EMC32-K7 providing a Generic Oscilloscope driver for EuT Monitoring purpose, a Generic Power Meter driver and a Generic Generator driver is now available.

5.2 Extensions

- **EMC32-K4: EMS Auto Test:**
  The EMS Auto Test option supports now to use a modulation loop.
  If the modulation loop has the highest priority the leveling engine will first setup a CW test signal and then tests all specified modulations in a sequence.
  If the frequency loop has a higher priority for each defined modulation in the modulation list of the EMS scan editor a single scan will be performed.

- **EMC32-K3: EMS Reverberation Chamber Measurements:**
  The reverberation chamber calibration algorithm supports now the calculation of the chamber Q factor using the calibration data of the unloaded or loaded chamber.

- **Field Uniformity Evaluation:**
  A new evaluation algorithm acc. to the automotive standard RI 2004/104/EC has been implemented. It allows calculating the averaged field strength over several field probe positions. The advantage of this procedure is that now the probe correction factors can be applied by using only a single probe. This is not applicable when using a field monitor system where the averaging is done inside the field monitor system.

- **EMS Scan and EMS Auto Test Editor:**
  Both editors allow now to specify a default report and EUT monitoring template.

- **EMS Leveling Options:**
  When using a frequency table only for the EMS scan EMC32 has added a symbol for every test frequency on the graphics trace. This feature can now be switched on/off by the operator.

- **EMS Leveling Options- Single Measurement:**
  A new option allows to store only one result value per frequency in the single measurement mode. When this option is active all frequencies measured during the single measurement will be stored. Due to this the Save button is disabled.

- **EMS Leveling Options-Single Measurement:**
  A new option allows to hold the immunity level step size during single measurement and thus switch off the automatic adaptation of the step size.

- **File/Test Options**:
  In the previous version the measurement mode was automatically activated when a new test was created. A new option allows switching off this automatism allowing to save the test before the measurement is started.

- **System Monitoring**:
  A new command in the user evaluation allows to calculate for example the difference of the current measurement value to results of a previous measurement. Therefore the result table of the previous measurement must be exported to the SYSTEM\Tables main folder.

5.3 Changes

- **Calculation of the Transducer/Antenna Reverse Power:**
  Since V5.20 optional an attenuation correction table for the directional coupler reverse path can be set. In V6.10 the path calculation has been changed when this path is activated in order to improve the accuracy of the reverse power calculation and to make the calibration easier. Refer to the graphics in the appendix A1 for detailed information.

5.4 iKey Merge Tool

The iKey Merge Tool installed with EMC32-S allows to move EMC32-Kxx and EMC32-U6 options to a main application iKey EMC32-S in order to reduce the number of iKeys which have to be connect to the EMC32 controller. Refer to the installation guide for further information.

6 Device Drivers

6.1 Improvements

The following improvements have been added to the corresponding device driver:

- **Field Probes:**
  For field probes supporting the simultaneous measurement of X,Y and Z axis (HI6005, HI61005, FM7004) a individual frequency correction of all axis can now be applied.

- **UPV Audio Analyzer:**
  The R&S audio analyzer UPV which is the successor of the R&S UPL is now supported.

- **System Control:**
  The system control driver allows now to define two video inserter devices.

- **Switching Units:**
  The switching unit driver supports now the use of the fiber optic transmission systems TESEO OAM01 and OAM02 as switching devices.

- **EMI Receiver ESU:**
  The driver now also includes dependencies concerning the minimum measurement frequency (preamp, input selection).

- **EMI Receiver ESCS30:**
  The driver now also supports the detector CISPR-AV (a hardware option for the instrument).

- **Generic Monitoring Driver:**
  The communication interface of the Generic Monitoring driver has been extended allowing an improved synchronization between EMC32 and an extern EUT Monitoring software. As communication transport channel either the LAN (TCP/IP) or the COM interface can be used.

7 Updating EMC32-S from V6.0 to V6.10

With the release of EMC32 V6.10 the Generic Generator driver as well as the Generic Power Meter driver is included in EMC32-K7 option. Additional the Generic Oscilloscope driver is available with EMC32-K7.

Since EMC32-K7 option is not integrated in the EMC32-U6 iKey (V6.0) the EMC32 iKey Merge Tool will provide the possibility to merge this option together with the EMC32-U6 option into the EMC32-S iKey. Doing this the drivers listed above will be available in V6.10 as used in V6.0.

The picture below shows the iKey Merge Tool when both the EMC32-S iKey and the EMC32-U6 iKey are connected to the PC and the *Load Keys* button was pressed. Move both options to the EMC32-S iKey option list and click on the *Save Changes to iKeys* button to start the transfer process.
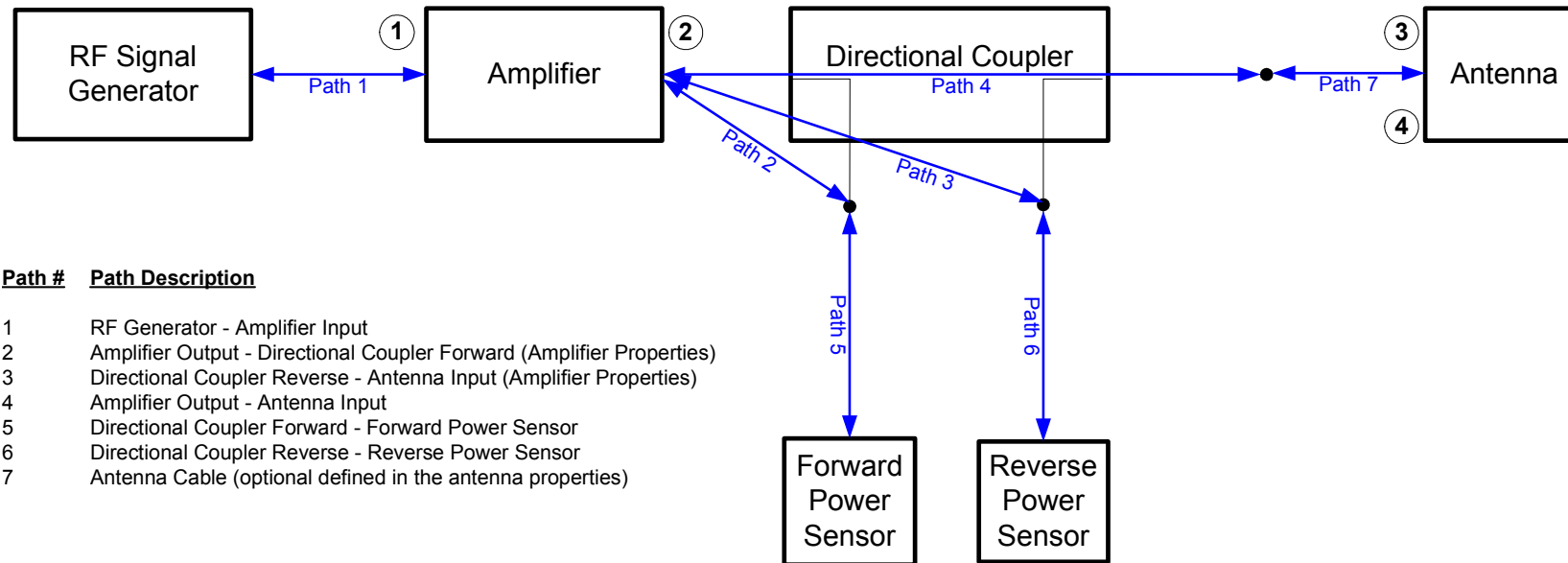
For further information on the *iKey Merge Tool* refer to the description in the EMC32 Installation Guide.
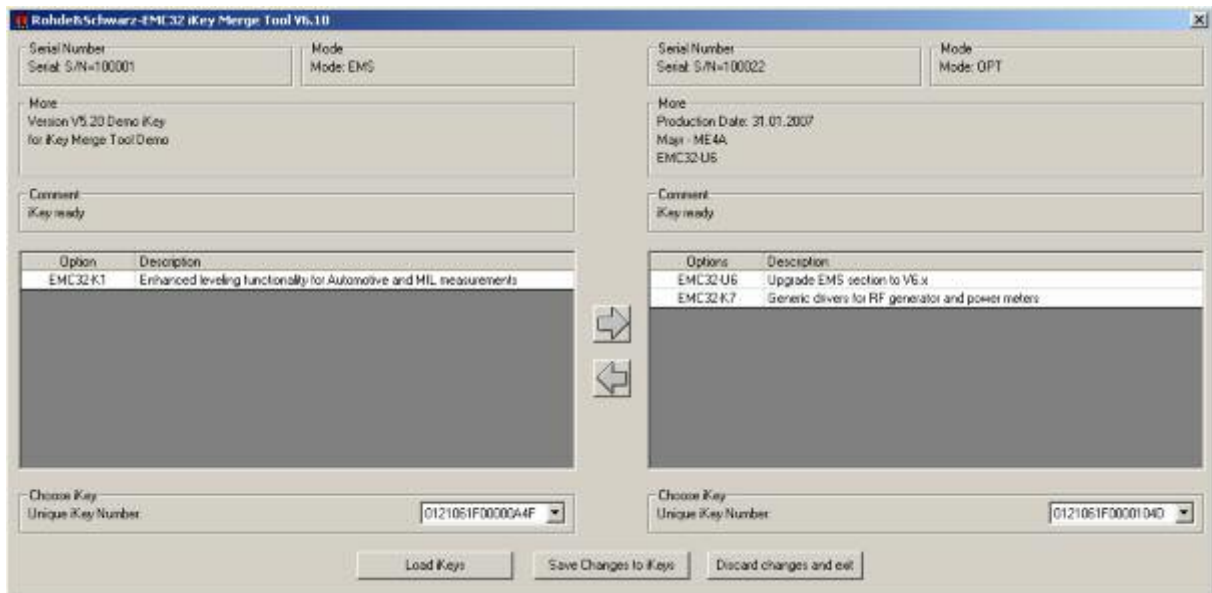
8 Appendix

8.1 A1: EMS Power Calculation

EMC32 Leveling Algorithm Power Calculations
in V5.20

```
┌──────────────┐        ①    ┌──────────┐  ②   ┌─────────────────────┐      ③  ┌──────────┐
│  RF Signal   │ ◄── Path 1 ──► │ Amplifier │     │ Directional Coupler │ ──►◄── │ Antenna  │
│  Generator   │              │          │     │      Path 4         │  Path 7 │          │
└──────────────┘              └──────────┘     └─────────────────────┘      ④  └──────────┘
```
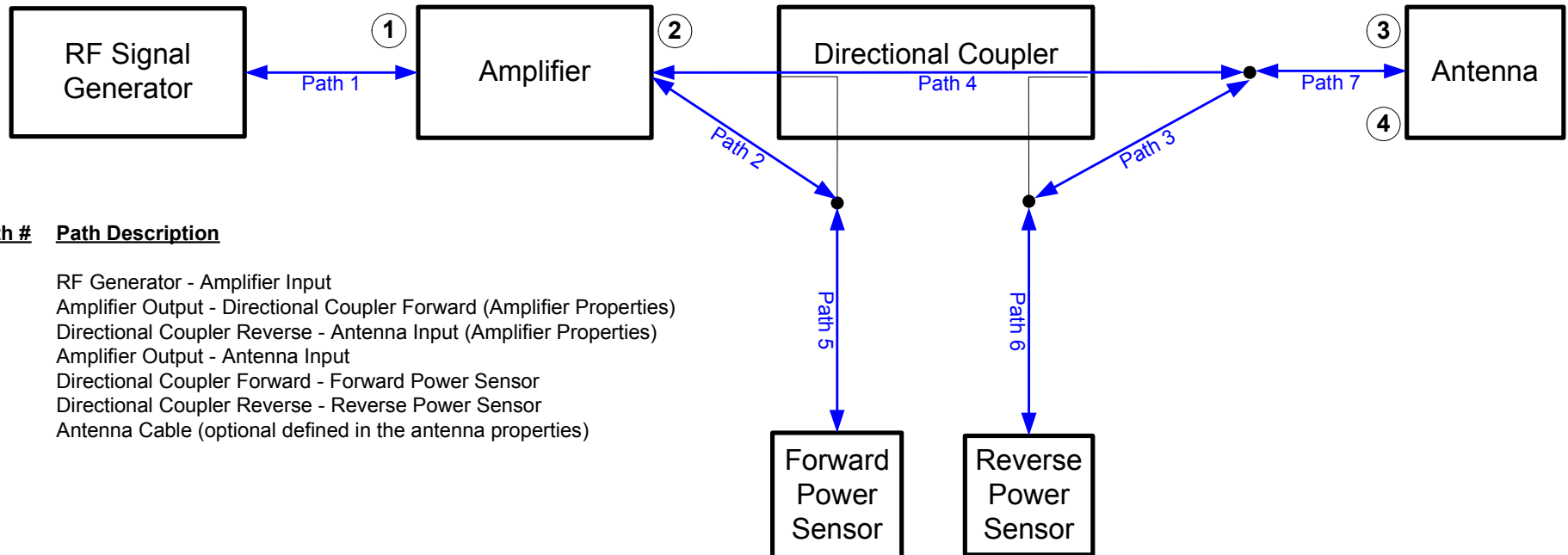
Path #   **Path Description**

1   RF Generator - Amplifier Input
2   Amplifier Output - Directional Coupler Forward (Amplifier Properties)
3   Directional Coupler Reverse - Antenna Input (Amplifier Properties)
4   Amplifier Output - Antenna Input
5   Directional Coupler Forward - Forward Power Sensor
6   Directional Coupler Reverse - Reverse Power Sensor
7   Antenna Cable (optional defined in the antenna properties)

Forward Power Sensor   Reverse Power Sensor

Point #	Power Name	Calculation
1	Amplifier Input	Generator Level - Path 1
2	Amplifier Forward	Forward Power Meter Level + Path 2 + Path 5
	Amplifier Reverse	Reverse Power Sensor Level + Path 6 + Path 2 (if Path 3 is not defined in the amplifier properties)
		Reverse Power Sensor Level + Path 6 + Path 3 (if Path 3 is defined in the amplifier properties)
3	Antenna FWD Power	Amplifier Forward Power - Path 4 - Antenna Cable
4	Antenna REV Power	Reverse Power Sensor Level + Path 6 + Path 3 + Path 4 + Path 7
		(if Path 3 is defined in the amplifier properties dialog)
4'	Antenna REV Power	Reverse Power Sensor Level + Path 6 + Path 2 + Path 4 + Path 7
		(if Path 3 is not defined in the amplifier properties dialog)

EMC32 Leveling Algorithm Power Calculations in V6.10

Path #	Path Description
1	RF Generator - Amplifier Input
2	Amplifier Output - Directional Coupler Forward (Amplifier Properties)
3	Directional Coupler Reverse - Antenna Input (Amplifier Properties)
4	Amplifier Output - Antenna Input
5	Directional Coupler Forward - Forward Power Sensor
6	Directional Coupler Reverse - Reverse Power Sensor
7	Antenna Cable (optional defined in the antenna properties)

Point #	Power Name	Calculation
1	Amplifier Input	Generator Level - Path 1
2	Amplifier Forward	Forward Power Sensor Level + Path 2 + Path 5
	Amplifier Reverse	Reverse Power Sensor Level + Path 2 + Path 6 (if Path 3 is not defined in the amplifier properties)
		Antenna REV Power - Path 7 - Path 4 (if Path 3 is defined in the amplifier properties)
3	Antenna FWD Power	Amplifier Forward Power - Path 4 - Antenna Cable
4	Antenna REV Power	Reverse Power Sensor Level + Path 6 + Path 3 + Path 7
		(if Path 3 is defined in the amplifier properties dialog)
4'	Antenna REV Power	Reverse Power Sensor Level + Path 6 + Path 2 + Path 4 + Path 7
		(if Path 3 is not defined in the amplifier properties dialog)