

---

# Spectral display of RF analysis of Test Receivers on a PC

---

Application Note 1EE05\_1E

[replaces: 1EPAN05E(02.94)]  
Subject to change

02.97, M. Keller / Dr. K. Blankenburg

Products:

**ESHS, ESVS, ESS, ESVB, ESVD**



**ROHDE & SCHWARZ**

## Introduction

All models of the receiver family ESXS are equipped with a remote-control interface to IEC 625-2 (IEEE 488.2).

Via this bus almost all instrument settings can be effected, measurements triggered and test results read in by the PC.

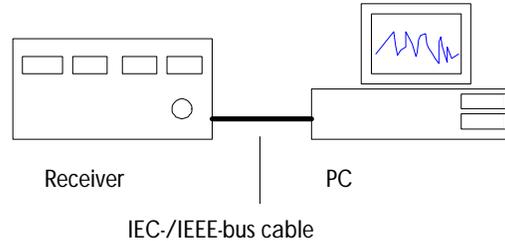


Fig. 1 Test setup

## Problem description

When using screenless models ESHS10, ESVS10, ESVB and ESVD you may wish to examine the spectrum of an ongoing RF analysis on a monitor.

Or you may want to transfer obtained measurement results to a PC for evaluation and for generating test reports.

## Solution to the problem

The SCAN.BAS program written in the widely used language QuickBASIC carries out RF analysis using the setups stored in the receiver, reads out measured values at the same time and displays them on a PC.

If limit values have been defined and selected, they are read from the receiver and displayed, too.

In addition, test results may be filed in the form of a table. This file can be easily processed using a word processing program or spread-sheets.

To be able to vary receiver settings quickly and reliably, setups may be taken from user-defined files and transferred to the receiver prior to RF analysis.

## Hardware and software requirements

The program can be run on IBM-PCs or IBM-compatible computers, eg on controllers of the PSA family, using a VGA graphics card. The computer must be equipped with an IEC/IEEE-bus interface (PS-B4 from R&S or PCIIA or PCAT from National Instruments).

The operating system MS-DOS must be installed on the PC and IEC/IEEE-bus driver GPIB.COM be loaded.

The compiled program SCAN.EXE is started by entering the program name and pressing the enter key.

The source text SCAN.BAS may be modified, newly compiled and started with the aid of QuickBASIC development tools.

Item	Designation
2nd IEC-bus Interface	PS-B4
IEC/IEEE-bus Driver	PS-K2
QuickBASIC	PS-K1

## Functions

### Command-line parameters

*/?* outputs a help menu with possible command-line parameters

*/ad n* *n* indicates the IEC/IEEE-bus address of the receiver. Standard address is 17.

*/cf file* *file* is the name of the file - optionally with path information - from which the settings are read that are programmed in the receiver before RF analysis is started.

Settings must be available in the form of IEC/IEEE-bus commands. They are separated by <CR><LF>. For instance, for setting the attenuator to 10 dB for a scan, command  
**SCAN:RECEIVER:ATTENUATION 10**  
 must be in the file.

/f file file is the name of a file - optionally with path information - used for storing all measurement results from the receiver in the form of a table.

File lines consist of data records made up of the following parts.

<i>Frequency</i>	in Hz
<i>Level</i>	in dB with 0.01-dB resolution
<i>Level detector 2</i>	in dB with 0.01-dB resolution (optional)
<i>Status word</i>	see operating manual
<i>Transducer</i>	in dB with 0.01-dB resolution
<i>Limit byte</i>	only with limit values activated (see operating manual)
<i>Limit value 1</i>	in dB with 0.01-dB resolution, only with limit values activated
<i>Limit value 2</i>	in dB with 0.01-dB resolution, only with 2 limit values activated

These data are parts of the blocks transferred via the IEC/IEEE bus. For detailed description see chapter on "Output of measurement results via IEC bus" in the operating manual.

Example for a file with measurement results:

List with scan results

```

9000 ,-3.21 , 0
10000 ,-6.29 , 0
11000 ,-8.83 , 0
12000 ,-9.17 , 0
13000 ,-16.13 , 0
14000 ,-17.51 , 0
15000 ,-21.09 , 0
16000 ,-21.39 , 0
17000 ,-24.55 , 0
18000 ,-21.33 , 0
19000 ,-16.45 , 0
20000 ,-18.23 , 0
21000 ,-17.87 , 0
22000 ,-16.63 , 0
23000 ,-15.89 , 0
24000 ,-20.67 , 0
...
...

```

## Control of program run

In addition to using command line parameters there are various ways of influencing program run:

Pressing the LOCAL key on the front panel of the receiver or any other key on the PC will terminate an ongoing RF analysis.

The PC goes into wait state and the display on the screen is retained.

The receiver is switched from remote (REMOTE) to manual control (LOCAL).

This allows receiver settings to be varied and to continue RF analysis with changed parameters.

If, in this status, the LOCAL key is pressed again, the PC starts a new RF analysis on the receiver and a new spectral display is generated. Pressing a key on the PC aborts the control program.

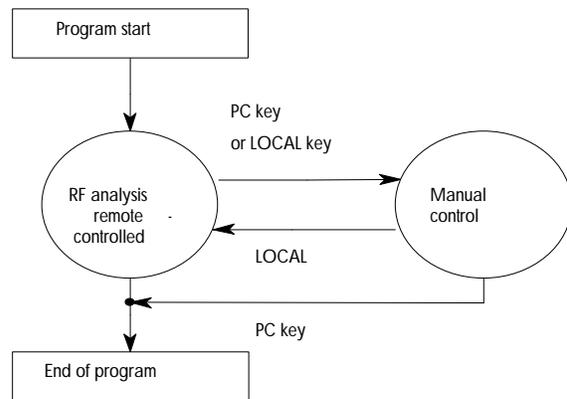


Fig. 2 Control of program run

With the aid of the MS-DOS program GRAPHICS.COM the displayed diagram can be output to a printer. To this end the GRAPHICS program must be loaded into the main memory of the PC before the SCAN program is started. Press the key combination SHIFT+PRINT to initiate a printout of the screen display.

A list of supported printers can be found in the MS-DOS operating instructions.

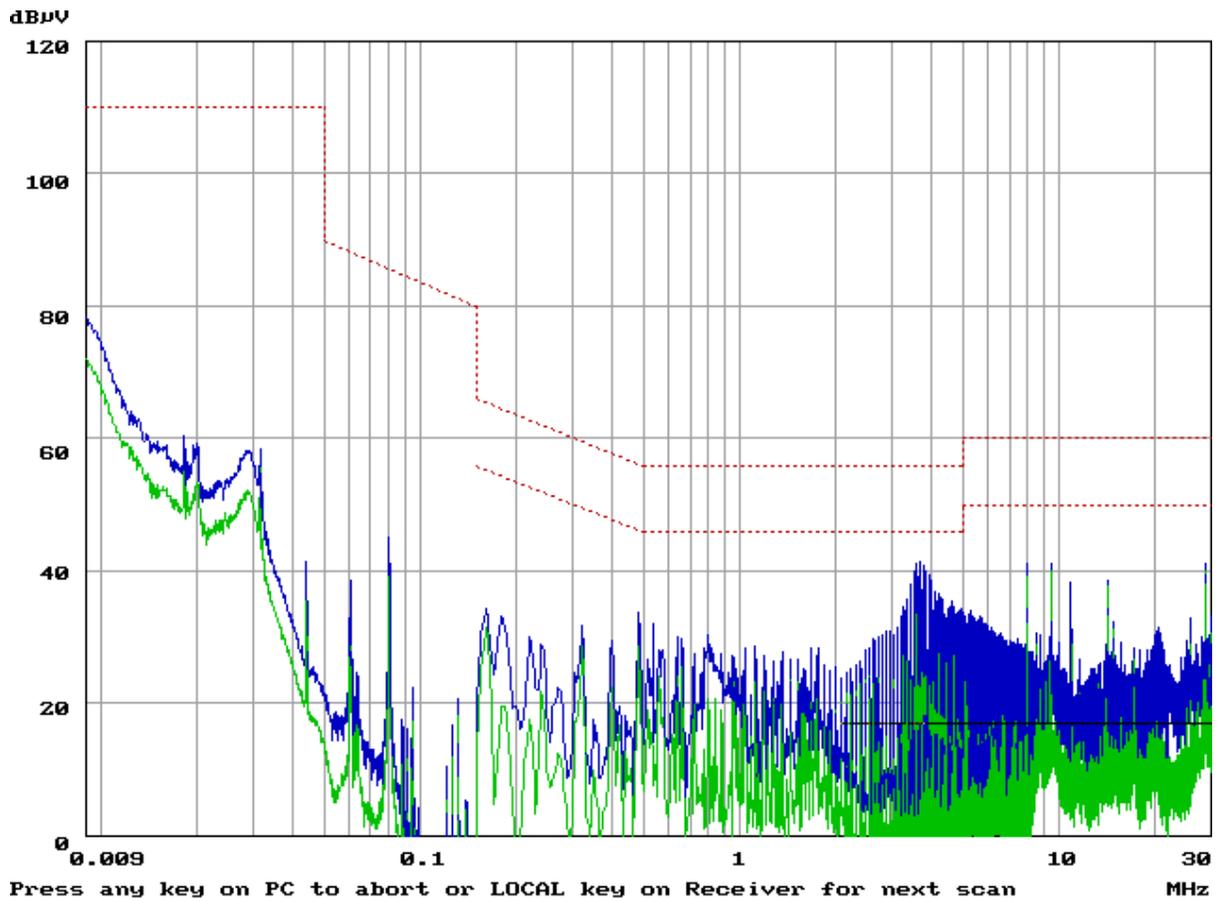


Fig. 3 Screen display on PC after a scan

**Availability of the software**

The programs SCAN.BAS and SCAN.EXE mentioned in this application note are available at the nearest Rohde & Schwarz representative.

**ROHDE & SCHWARZ GmbH & Co. KG**

Mühlhordstraße 15 , D-81671 München  
 POB 801469 , D-81614 München  
 Tel +49-(0)89 4129-0  
 Fax +49-(0)89 4129-3567  
 Internet: <http://www.rsd.de>