FSH4Remote

Remote Control for R&S®FSH4/8, R&S®FSC and R&S®ZVH

Application Note

Products:

- R&S®FSH4/8
- R&S®FSC
- R&S®ZVH
- R&S®FSH-K40
- R&S®ZVH-K40
- R&S®ZVH-K1

FSH4Remote is a program for connecting the R&S®FSH4/8, the R&S®FSC or the R&S®ZVH to a computer for providing remote control of the functions. It runs under Microsoft Windows and Linux operating systems.

This application note describes the easy use of FSH4Remote to control the functions of the R&S®FSH/FSC/ZVH and read any measurement data.

ROHDE&SCHWARZ

Application Note

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The following abbreviations are used in this application note for Rohde & Schwarz test equipment:

- The R&S®FSH4/8 Handheld Spectrum Analyzer, the R&S®FSC Spectrum Analyzer and the R&S® ZVH Cable and Antenna Analyzer are referred to as instrument.

1 Introduction

FSH4Remote is a program for connecting the R&S®FSH4/8 Handheld Spectrum Analyzer, the R&S®FSC Spectrum Analyzer or the R&S® ZVH Cable and Antenna Analyzer to a computer for providing remote control of the functions.

The physical connection can be either with a USB cable or via LAN / Internet.

Use FSH4Remote from a computer to remote control the functions of the instruments or to read out any measurement data. Undertake a diverse range of monitoring tasks such as spectrum analysis or power meter measurements.

FSH4Remote is a free-of-charge program that runs under Microsoft Windows or LINUX operating systems and is easy to use.

Note:
For controlling the R&S®**FSH3/6/18** Handheld Spectrum Analyzer use FSHRemote.

2 Software Features

FSH4Remote is simple to install and simulates the user interface of the instruments in a comfortable on the screen of the PC. The following functions are provided:

- connection management between the computer and the instrument
- frequency and measurement range settings
- selection of the measurement type
- level settings
- saving trace data as an image or csv file
- save and recall instrument settings and measurement data

3 Hardware and Software Requirements

3.1 Hardware Requirements

- CPU: Pentium 1 GHz or better
- Hard disk: 20 Mbyte free
- Monitor: SVGA color monitor, resolution 1024x768 or better

3.2 Software Requirements

FSH

- FSH-K40 remote control option must be activated in the FSH (keycode)
- FSH firmware version V1.30 or later

FSC
- FSC firmware version V1.1 or later

ZVH
- ZVH-K40 remote control option and ZVH-K1 spectrum analysis application must be activated in the ZVH (keycode)
- ZVH firmware version V1.11 or later

Windows
- Microsoft operating system (XP, Vista, 7)
- VISA runtime

Linux
- Kernel 2.6.9.* or later
- NI VISA 15 or later (NI VISA has been tested on different distributions; please visit www.ni.com for more information)
- Qt library 5.5.1 or later

4 Installing and Starting FSH4Remote

Windows
To install FSH4Remote, execute the file FSH4Remote_<version number>.exe with a double click. The installation wizard is activated. Please note that the installer requires administrator rights.

Follow the instructions from the wizard. During installation, select the directory where you want the program to be installed.

FSH4Remote requires approximately 20 MB hard disk space. The wizard adds an entry for FSH4Remote in the computer's Start->Programs menu and also checks if the VISA driver is installed.

No other parameters are required for installation.

For deinstallation, Rohde & Schwarz supplies the program uninstall.exe, which removes FSH4Remote completely from the computer.

In addition to the installer a zip file is provided alternatively. Simply unzip the archive to a place of your choice.

Linux
To install FSH4Remote, simply unzip the FSH4Remote_<version number>.tar.gz archive to a place of your choice in your /home/<user name>/ directory.
To start the program, simply navigate with a file manager to this directory and start the FSH4Remote executable.

Start
To start the program, select FSH4Remote from the Program submenu in the Windows Start menu or use the desktop icon.

5 Operating FSH4Remote

After the program starts, the following screen appears:

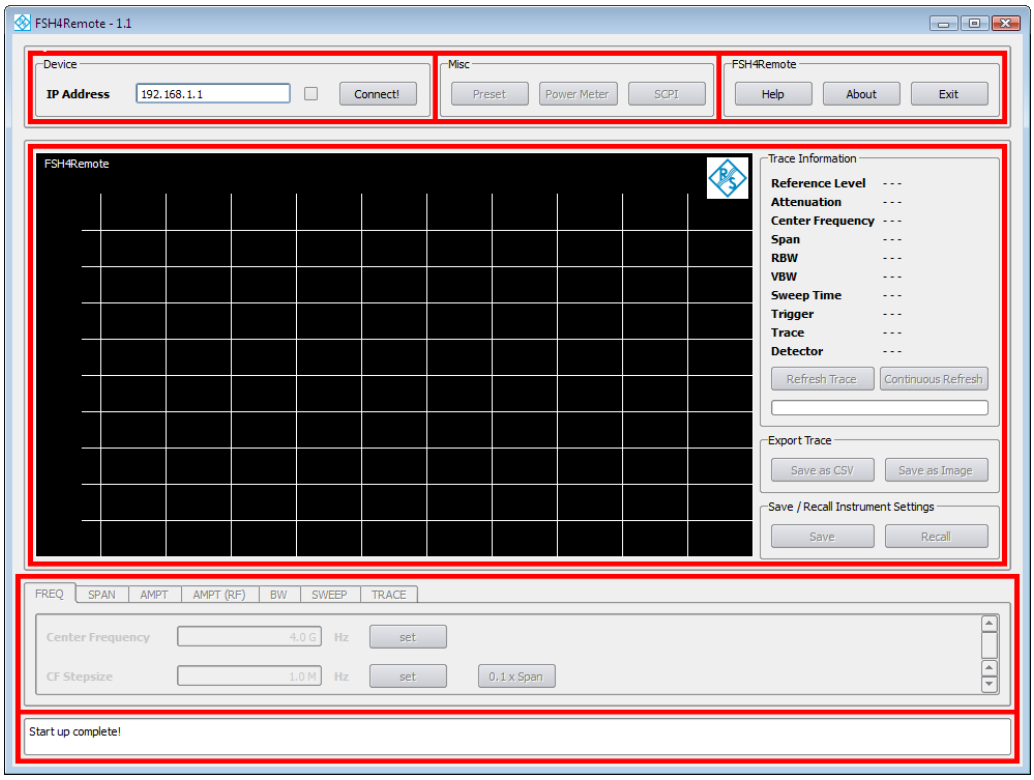


Figure 1: FSH4Remote start screen with individual marked segments

The individual sections (marked in red) are described below.

5.1 Connecting

First, the instrument must be connected to the PC. The IP address of the FSH4 has to be entered under Device.

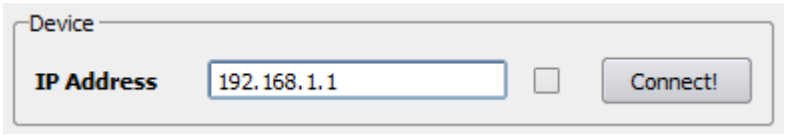


Figure 2: IP address for the FSH4Remote connection

You can enter the IP address of the FSH4 either directly in the instrument under **SETUP/INSTRUMENT SETUP** in the **LAN PORT** area, or you can read it directly when **DHCP** is used (Figure 3).

Note:
If a USB connection is used, then the IP address must be set to **172.16.10.10**.

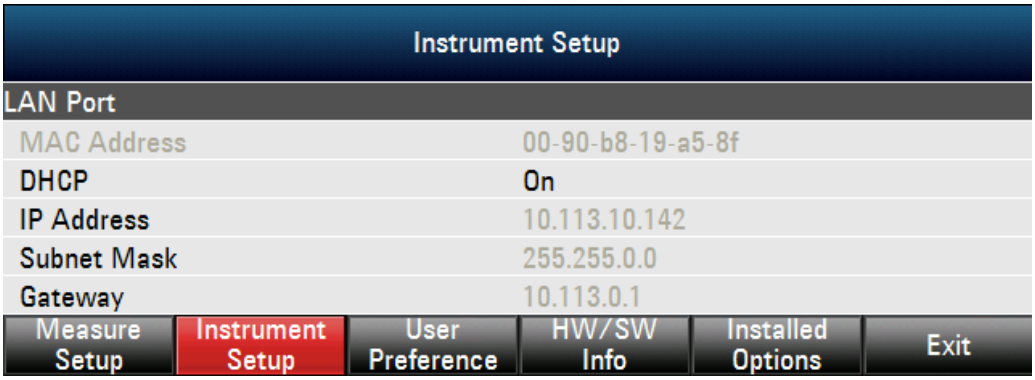


Figure 3: Setting the IP address in the instrument

Then click the **Connect!** button; after a short period of time the instrument connection should be established (Figure 4 and Figure 5).

Figure 4: Connection to the instrument established in FSH4Remote, the address is greyed out, Disconnect button appears.

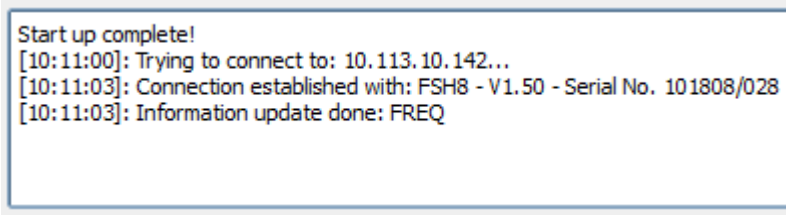


Figure 5: The successful connection can be seen on the FSH4Remote status bar.

After the instrument has been successfully connected, all other functions can be used.

To end the connection, click **Disconnect!**.

Note:
Note that after the FSH4Remote connection has been established, a preset is executed on the instrument. The instrument is switched to the spectrum analyzer mode and the "sample detector" is activated.

5.2 Trace

In the Trace area, the current instrument screen and additional data can be read out and displayed in FSH4Remote. Simply click the **Refresh Trace** button. The instrument executes a single measurement, and the trace plus the current data are displayed on FSH4Remote. When the **Continuous Refresh** button is clicked, the instrument continuously repeats the measurement until **Stop!** is clicked.

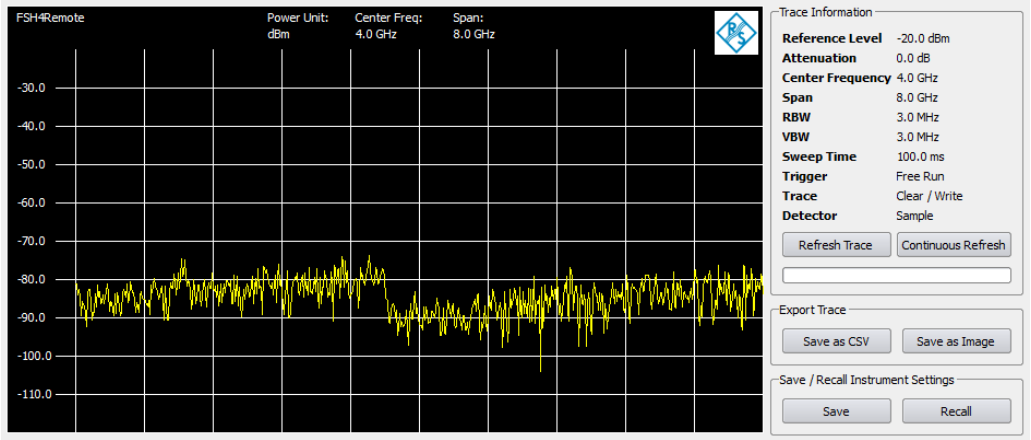


Figure 6: Display of a trace and its associated data in FSH4Remote

Export

The trace data obtained from the instrument can be saved under Export.

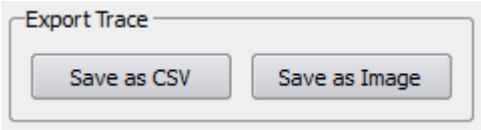


Figure 7: Export functions in FSH4Remote

Under **Save as CSV**, the individual points on the trace are saved to the hard disk as a comma-separated file. In addition to the actual trace points, trace data, such as the current frequency, is saved at the beginning of the file.

This file can be displayed and processed with a free program such as FSH4View, FSCView, or ZVHView. These programs contain enhanced marker and zoom functions.

Under **Save as Image**, the trace can be saved as an image. The following formats are supported:

- png
- jpg
- bmp
- xpm.

Save / Recall Instrument Settings

Instrument settings and measurement results can be saved and recalled at a later date under “Save / Recall Instrument Settings”:

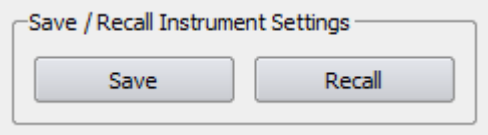


Figure 8: ”Save/Recall”-Function in FSH4Remote

By pressing the button **Save**, the following dialog appears:

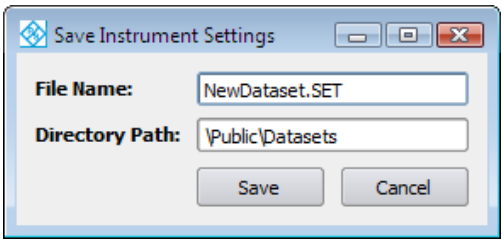


Figure 9: “Save”-Dialog

This dialog allows to specify a file name and a directory. The file extension for this kind of files is *.SET*. By pressing **Save** the data set is saved to the directory and the name that has been given. To quit press **Cancel.**

Previously saved measurement results and settings can be recalled by pressing the button **Recall**. The following dialog allows to configure the operation:

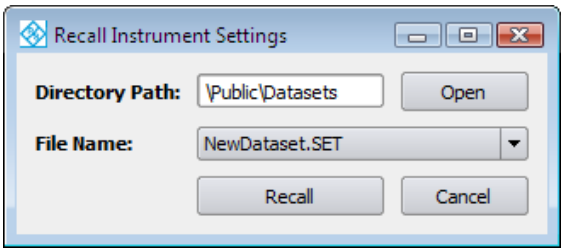


Figure 10: "Recall"-Dialog

The dialog shows a list of all data sets that have been saved to the specified directory. If the directory was changed, the button **Open** allows to refresh the selection. After selecting press **Recall** to load the settings of the selected data set or **Cancel** to quit.

Note:
The default directory path is “\Public\Datasets”. Removable disks like a SD card or a memory stick can be used over the instrument file system. They are set by the specified directory. Use “\Storage Card\...” for a SD card and “\USB\...” for a memory stick.

Cursor
The built-in cursor shows the amplitude of a certain frequency, making it possible to obtain individual measured values directly. Position the mouse on the graph; click and hold the left mouse button while moving the mouse. Release the mouse button when you reach the point of interest; the cursor remains in this position. The frequency and level are shown in the upper right of the graph. At the same time, the current measurement value is automatically copied to the clipboard. The right mouse button releases the cursor.

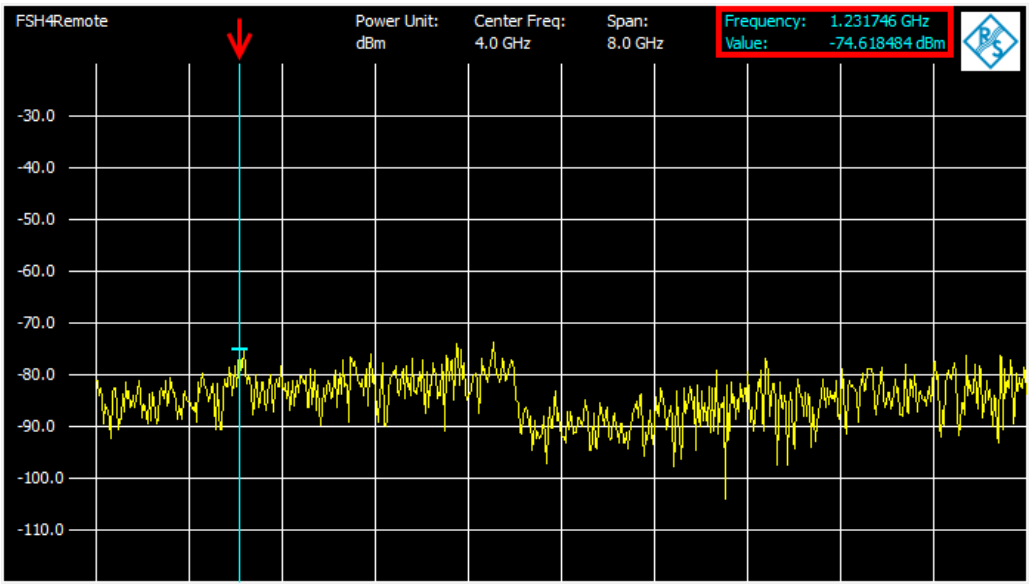


Figure 11: Selecting a value with the FSH4Remote cursor; in the upper right corner frequency and level are displayed

5.3 Set

In the FSH4Remote set area, individual settings can be transferred to the instrument. The instrument's hardkeys are represented as tabs in FSH4Remote. Select a tab to see more parameters. All parameters that can be set in the instrument by pressing a hardkey can also be set in FSH4Remote.

Simply enter a numeric value in the appropriate field and click **Set** to transfer the setting. Note that the numeric value is always based on the base unit (such as Hz). You can also use standard prefixes such as **G** for Giga in the numeric area. Scientific notation is also supported, which means that there are three ways to enter a number.

Example: **1000000000 = 1 G = 1E+9**

Figure 12 shows an example for the span.

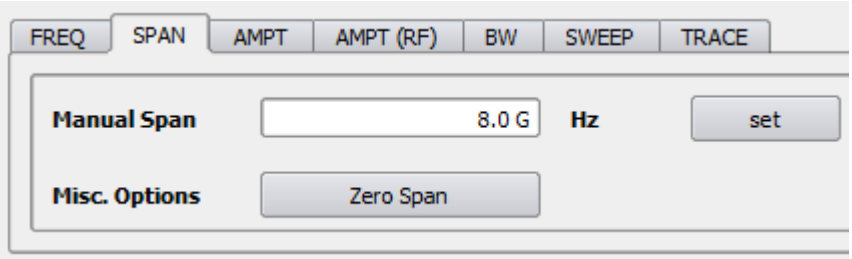


Figure 12: Operating example in FSH4Remote for the set area: here the span settings

Prefixes in FSH4Remote	
Prefix	**FSH4Remote notation**
Peta	P
Tera	T
Giga	G
Mega	M
Kilo	k
Milli	m
Micro	u
Nano	n
Pico	p
Femto	f
Atto	a

Table 1: Prefixes supported in FSH4Remote

In addition to manual setting, some parameters can also be operated in the *auto* mode. The deactivated (greyed out) auto button in FSH4Remote shows the *auto* mode. When a value is set using the **set** button, the *auto* mode is automatically deactivated.
Figure 13 shows an example for the bandwidth (BW).

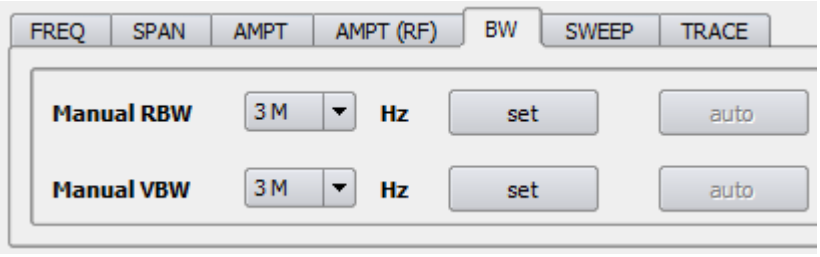


Figure 13: Operating example for auto mode in FSH4Remote

5.4 Misc

Several functions are supported in the Misc(ellaneous) area.

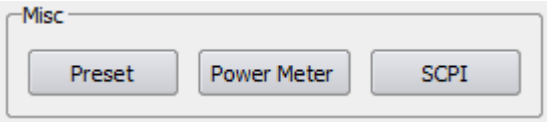


Figure 14: Functions in the FSH4Remote Misc area

Preset

Clicking the **Preset** button changes all instrument settings to the default settings (presets) and then activates the sample detectors.

Power Meter

Optionally available power sensors (FSH-Z1/Z18 power sensors and FSH-Z14/Z44 directional power sensors) can be connected to the instrument. Clicking the **Power Meter** button switches the instrument from spectrum analyzer mode to power meter mode. Figure 15 shows the power meter mode start screen.

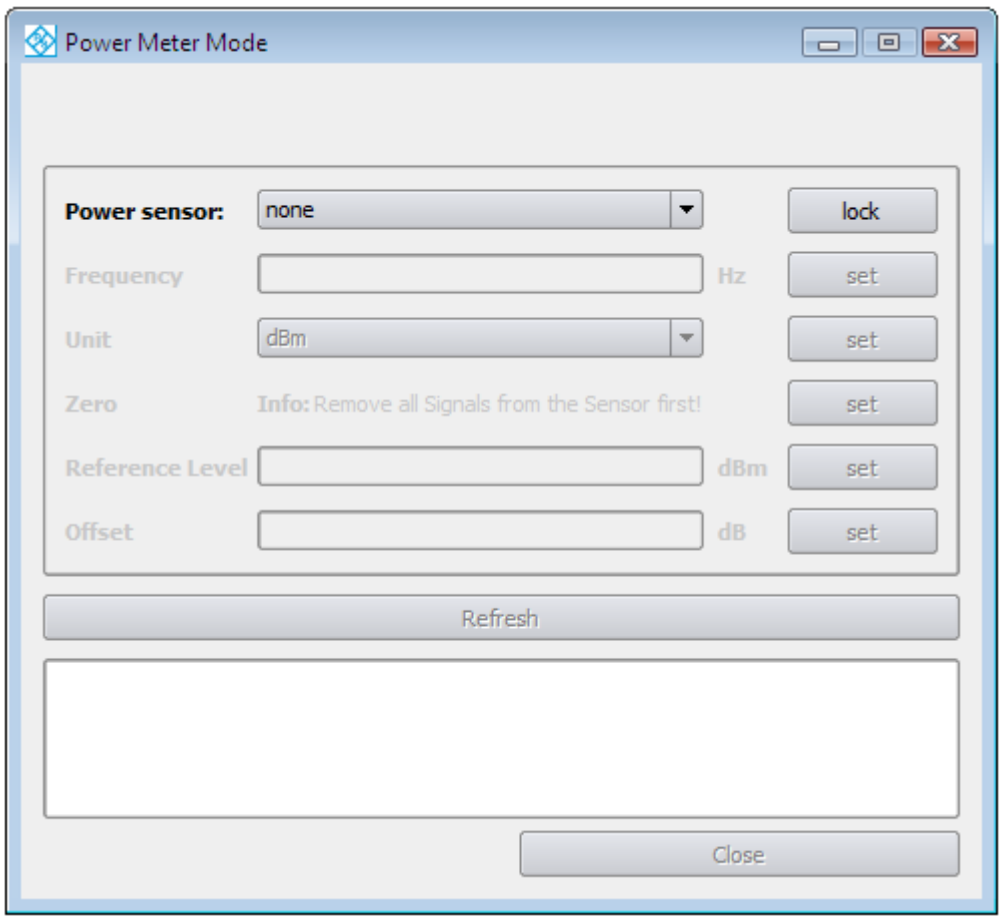


Figure 15: FSH4Remote start screen in power meter mode

First select which sensor is connected (Figure 16) and then click the **lock** button.

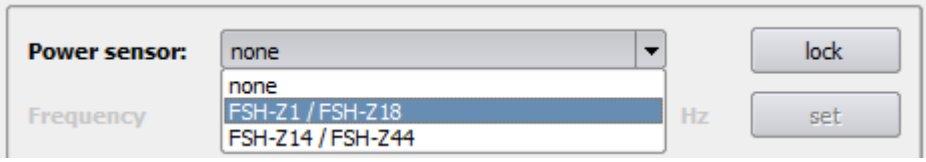


Figure 16: Selecting the power sensor in FSH4Remote

Figure 17 shows the FSH4Remote power meter mode. The measured power is shown at the top. Several settings can be made in the bottom area. FSH4Remote offers all settings which are available also in manual operation.

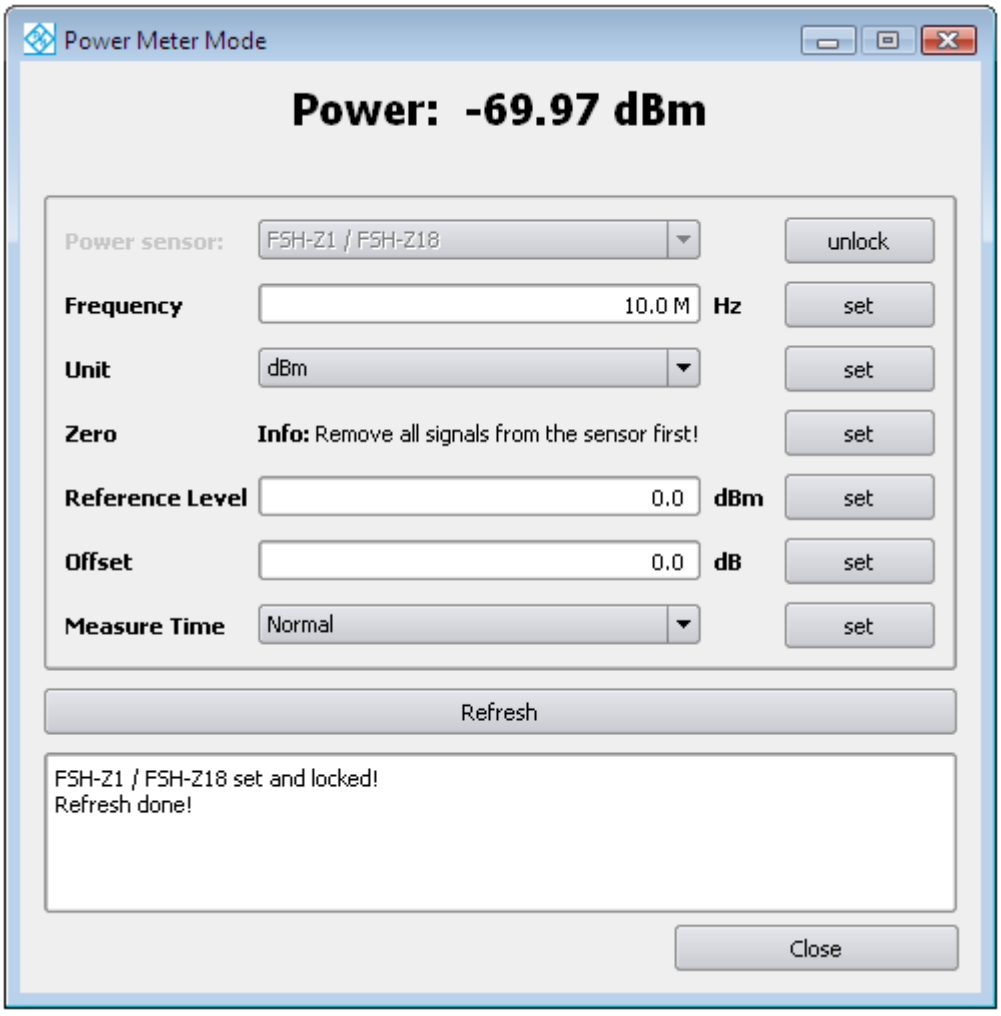


Figure 17: FSH4Remote power meter mode: measurements and settings

Closing the power meter mode window (**Close** button) switches the instrument back to the spectrum analyzer mode.

SCPI

Here you can send individual remote commands to the instrument and receive corresponding responses. Click the **SCPI** button to bring up the SCPI interface (Figure 18). Write the remote command in the write buffer and click the **Write** button. Click the Read button to display any responses from the instrument in the read buffer. Click the **Close** button to close the SCPI window.

Note:
A complete list of SCPI commands for the R&S®FSH4/8 in the Manual FSH-K40 [3], for the R&S®FSC in the Manual FSC [4] and for the R&S®ZVH in the Manual ZVH-K40 [5].

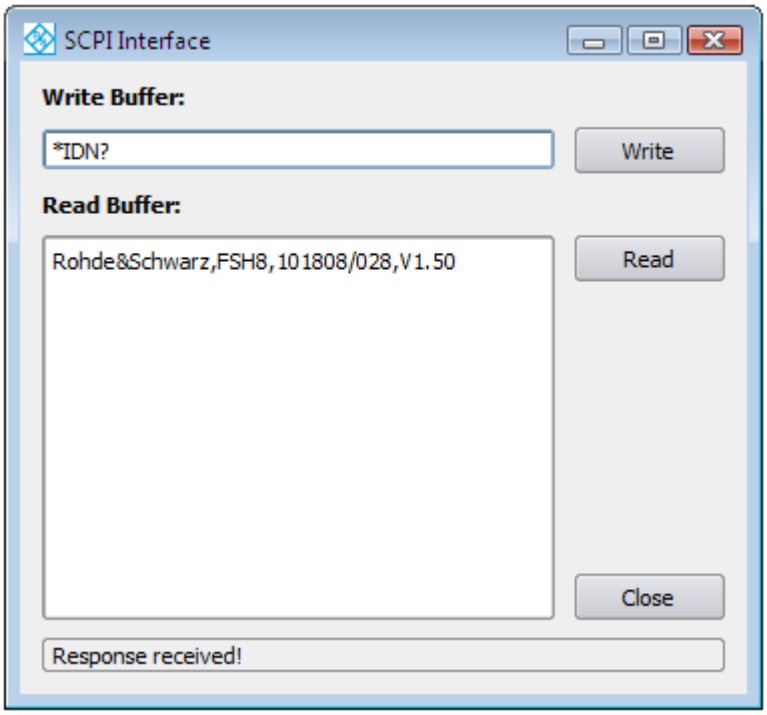
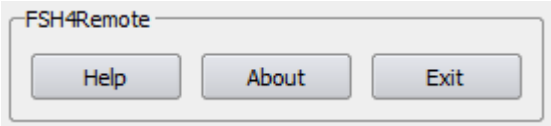


Figure 18: Simple SCPI interface in FSH4Remote

5.5 FSH4Remote

A variety of information is available in the FSH4Remote area.



Help

Clicking the Help button opens a window that contains links to **Rohde & Schwarz** help documentation. There you will find links to the instrument manuals and the remote control instructions (**K-40** option).
Clicking these links opens them in your standard browser.

About

Clicking the About button opens a window containing information about the FSH4Remote software version.
There you will also find links to the latest version of this application note and the ***"Terms of Use".***
Clicking these links also opens them in your standard browser.

Exit

The exit button ends the connection between FSH4Remote and the device, and ends the program.

5.6 Status

All FSH4Remote status information is written to this area. Figure 19 shows an example.

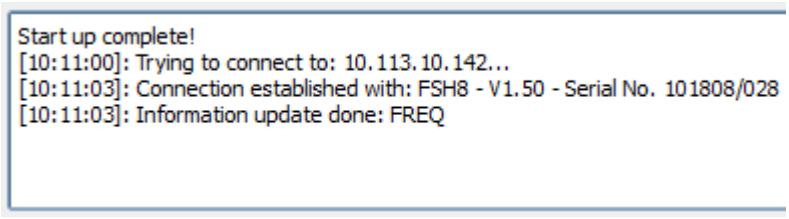


Figure 19: FSH4Remote status bar

6 Appendix

6.1 References

[1] Rohde & Schwarz: **1MA170: FSHRemote**, Application Note, March 2007
[2] Rohde & Schwarz: **Manual FSH4 View,** Manual, August 2008
[3] Rohde & Schwarz: **Manual FSH-K40**, Manual, August 2008
[4] Rohde & Schwarz: **Manual FSC,** Manual, August 2008
[5] Rohde & Schwarz: **Manual ZVH-K40**, Manual, December 2010

6.2 Additional Information

Please send your comments and suggestions regarding this application note to

TM-Applications@rohde-schwarz.com

6.3 Ordering Information

Ordering information		
Spectrum Analyzer		
FSH4/8	**Handheld Spectrum Analyzer**	**1309.6000.xx**
FSH-K40	Remote Control via LAN or USB	1304.5606.02
FSC	**Spectrum Analyzer**	**1314.3006.xx**
ZVH	**Cable and Antenna Analyzer**	**1309.6800.xx**
ZVH-K40	Remote Control via USB or LAN	1309.7013.02
Accessories		
FSH-Z1	Power Sensor (8 GHz)	1155.4505.02
FSH-Z18	Power Sensor (18 GHz)	1165.1909.02
FSH-Z14	Directional Power Sensor (1 GHz)	1120.6001.02
FSH-Z44	Directional Power Sensor (4 GHz)	T000.0003.22

Note: Available options are not listed in detail.
Please contact your local Rohde & Schwarz sales office for further assistance

About Rohde & Schwarz
Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established more than 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Environmental commitment
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- Continuous improvement in environmental sustainability
- ISO 14001-certified environmental management system

Certified Quality System
ISO 9001

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