

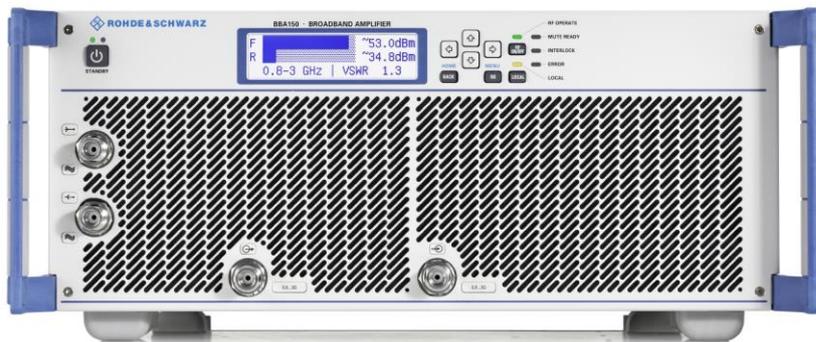
Remote Monitoring and Control of Broadband Amplifiers via Web Browser

Application Note

Products:

- R&S®BBA150
- R&S®BBL200

This document answers frequently asked questions regarding Rohde & Schwarz Broadband Amplifiers. It describes remote operation and monitoring of the R&S® Broadband Amplifier series through a standard web browser.



Note:

Please find the most up-to-date document on our homepage <http://www.rohde-schwarz.com/appnote/7TA1>.

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1 Introduction

The aim of this application note is to provide information regarding Rohde & Schwarz Broadband Amplifiers with integrated, browser based graphical user interface. This paper shall help users, application engineers and software developers to easily get an understanding of the possibilities for remote control of the broadband amplifiers.

It does not describe any programming languages or how to develop software in any programming language.

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2 Using the Web interface

The Local Area Network (LAN) interface of instruments opens a whole new field of applications in the area of remote monitoring and control. In contrast to the common IEEE-488 bus (GPIB), where the cable length was rather limited, the network interface virtually makes distance between instrument and operator boundless.

The Web Interface is an alternative way to operate or monitor the R&S broadband amplifiers.

With the integrated, browser-based graphical user interface (WebGUI) of the R&S®BBA150 and BBL200 broadband amplifiers, you can easily configure the most common settings and perform measurements in the provided measurement modes.

There is no installation required. The WebGUI can be used with all devices and operating systems, including tablets and smart phones that are connected to the same network.

Required equipment:

- R&S® Broadband Amplifier(s)
- At least one LAN cable
- A device with a supported web browser installed:
 - Mozilla Firefox 33 or later
 - Google Chrome 36 or later
 - Microsoft Internet Explorer 10 or later
 - Safari 5.1 or later
- Please make sure, that Java script is enabled

2.1 Network Setup

A very simple network configuration is shown in figure 1.

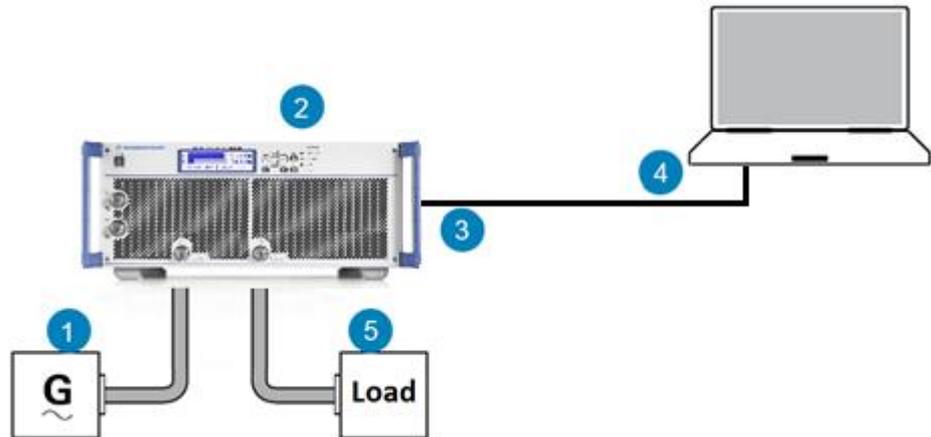


Figure 1: Simple network configuration including Signal Generator and Load

1 = Signal source

2 = R&S® Broadband Amplifier

3 = RJ-45 Ethernet connector (at the rear of the amplifier) [Connector LAN - X104]

4 = PC with a supported web browser installed

5 = Load

An alternative network configuration using a LAN Switch and/or a Router can be seen in the following picture.

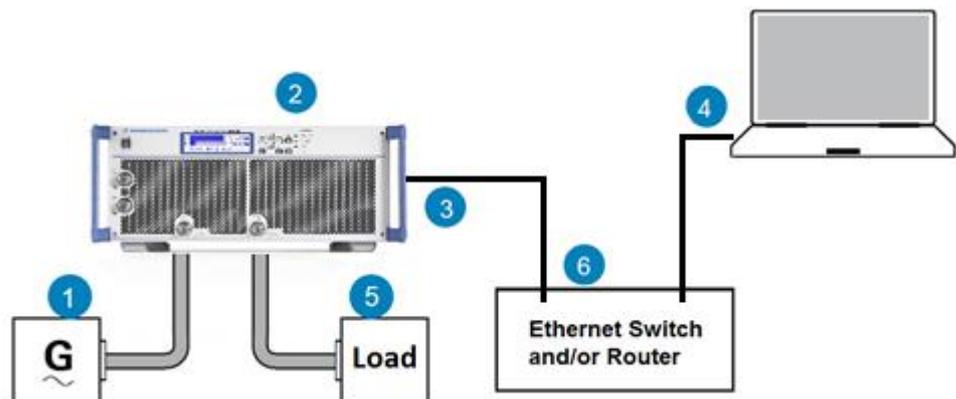


Figure 2: Network configuration with a LAN switch and/or Router

1 = Signal source

2 = R&S® Broadband Amplifier

3 = RJ-45 Ethernet connector (at the rear of the amplifier) [Connector LAN - X104]

4 = PC with a supported web browser installed

5 = Load

6 = Ethernet switch and/or router

Depending on the network capabilities, the TCP/IP address information for the Broadband Amplifier can be obtained in different ways:

- If the network supports dynamic TCP/IP configuration using the Dynamic Host Configuration Protocol (DHCP), the address information can be assigned automatically. This feature can be selected in the menu of the front panel "DHCP Client [...]". The default setting is "DHCP Client OFF". Setting "DHCP Client ON" deactivates the IP address and subnet mask settings. The current setting is changed using the OK button.
- If the network does not support DHCP, the broadband amplifier is set to an alternate TCP/IP configuration. Therefore, the IP address is set to a default value and can be changed manually.

Anyway the current IP address can be obtained from the front panel menu. Press the "OK" button to enter that menu.



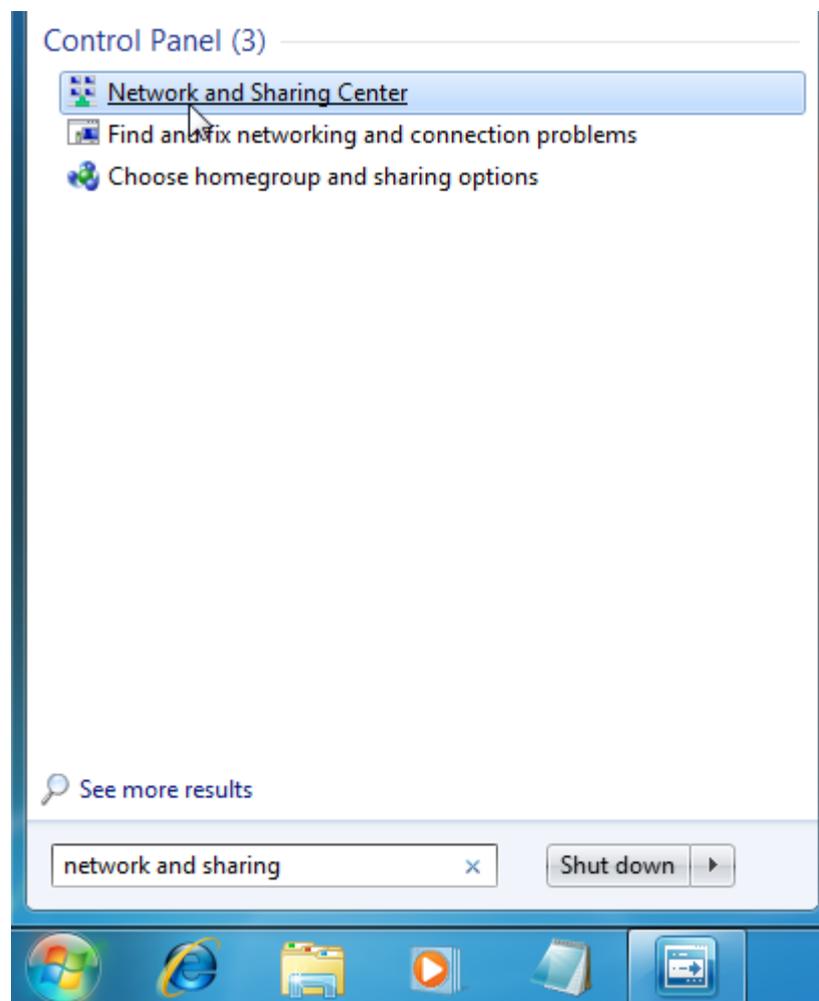
Figure 3: Front panel of the R&S®Broadband Amplifier Series

2.2 Direct Connection of Client Computer with Microsoft Windows to a R&S® Broadband Amplifier using a static IP address

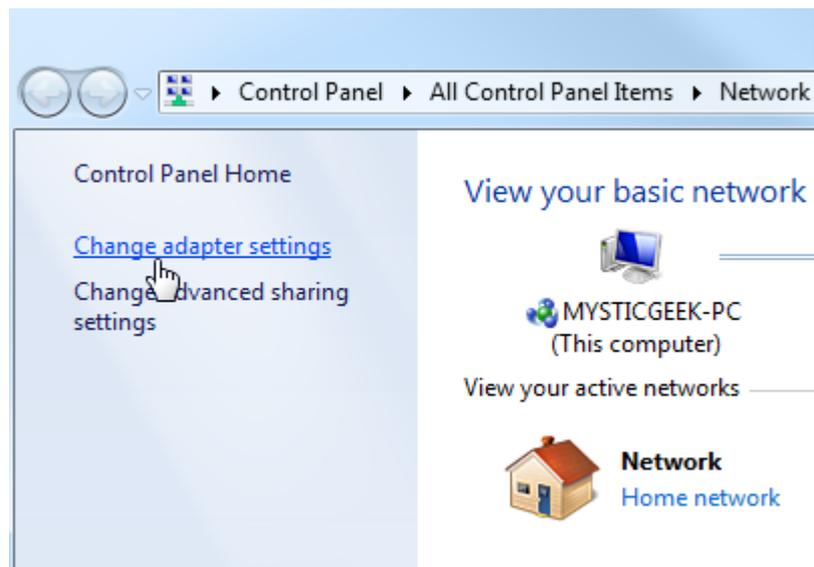
This example is written for Windows 7, Windows 8.x or Windows 10 users.

In order to control the amplifier over Ethernet, the IP address configuration of the amplifier and the client computer have to fit to each other.

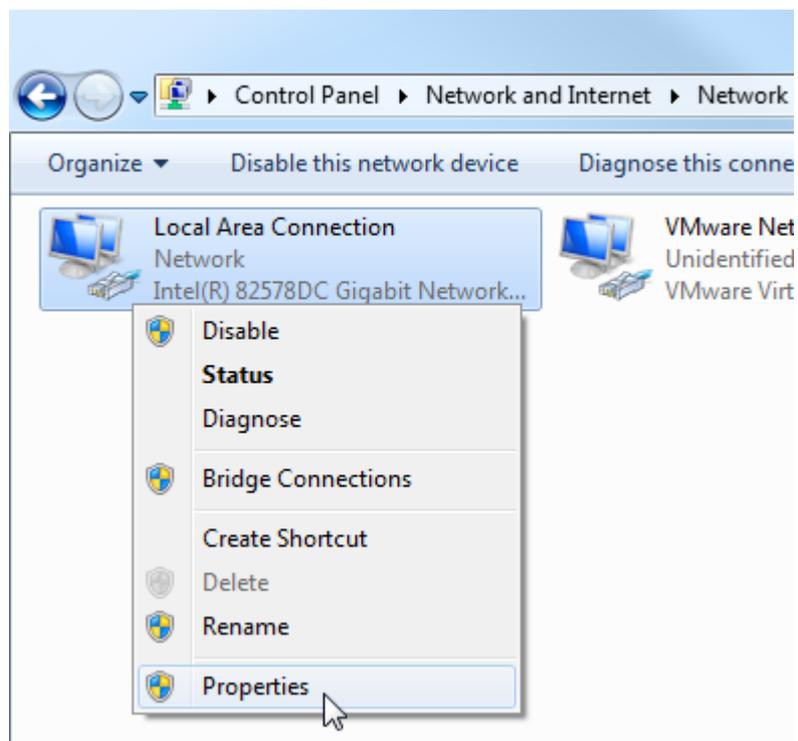
In case of a DHCP Server, you can skip this chapter. In case of static IP Configuration, the IP address of the Personal Computer has to be set manually. To change the computer's IP address in Windows, type network and sharing into the Search box in the Start Menu. Select Network and Sharing Center when it comes up.



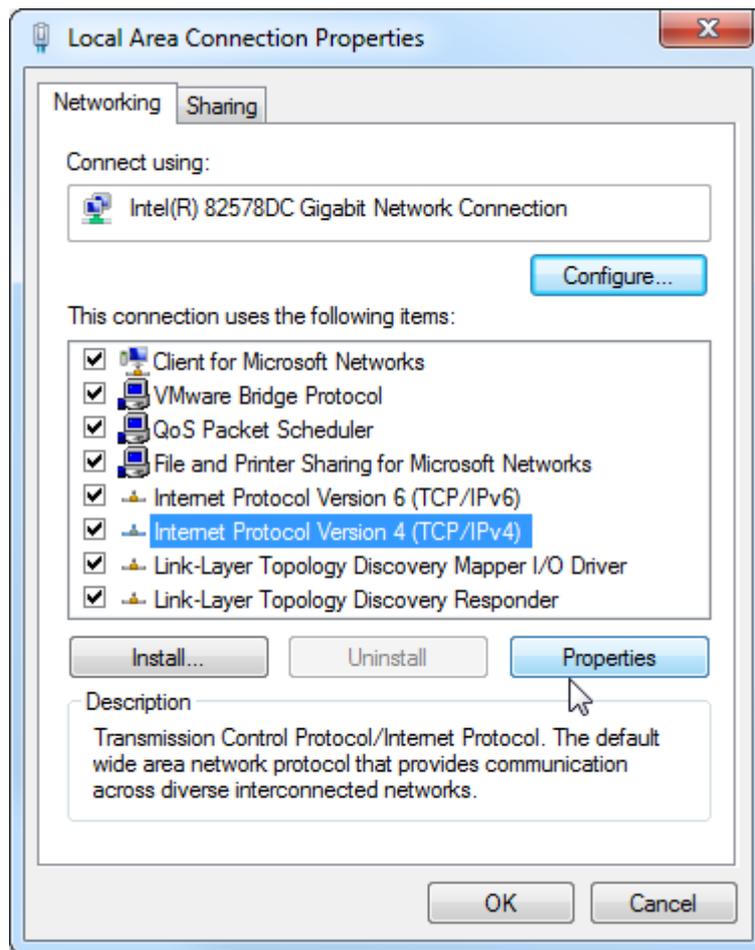
Then when the Network and Sharing Center opens, click on Change adapter settings. This will be the same on Windows 7, 8 and 10.



Right-click on your local adapter and select Properties.

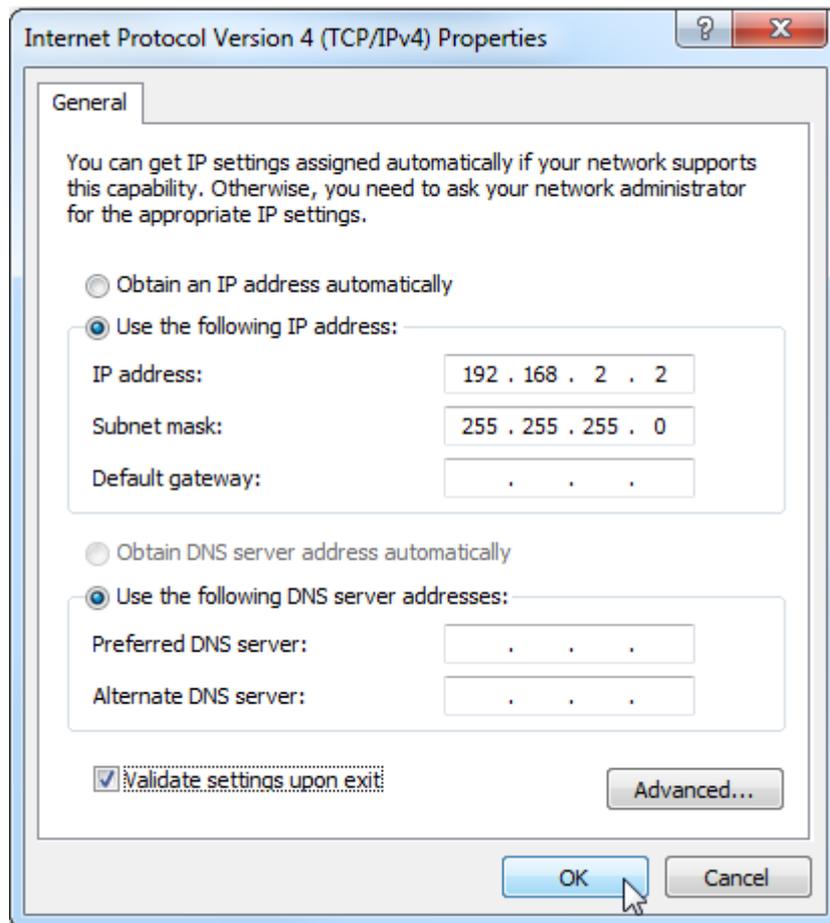


In the Local Area Connection Properties window highlight Internet Protocol Version 4 (TCP/IPv4) then click the Properties button.



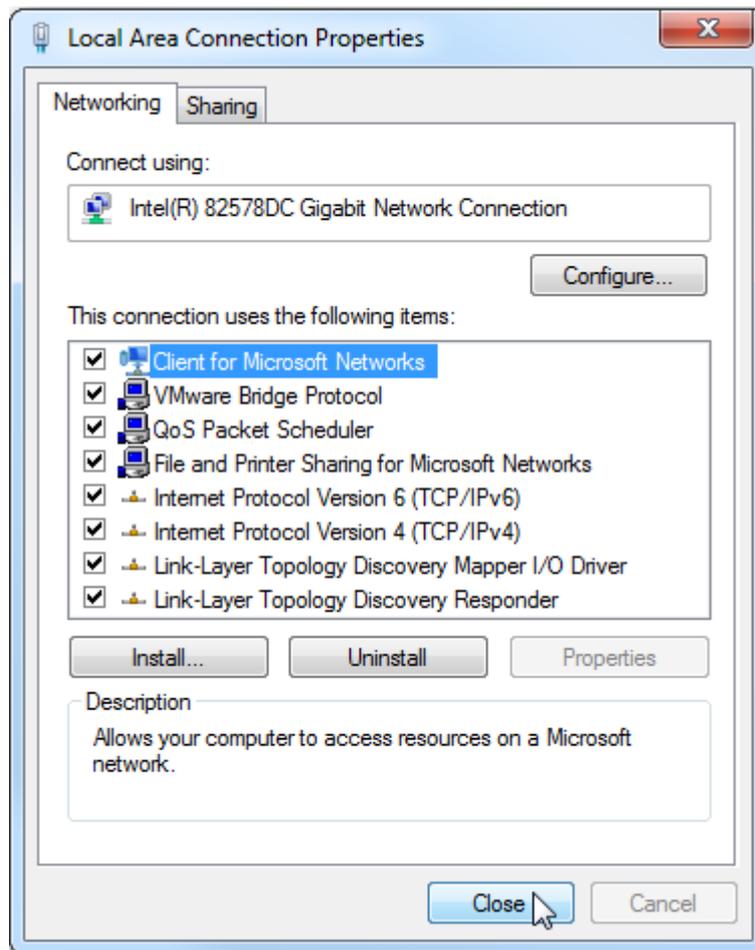
Now select the radio button Use the following IP address and enter in the correct IP, Subnet mask, and Default gateway that corresponds with your network setup. Then enter your Preferred and Alternate DNS server addresses. Here we're on a private network and using a simple Class C network configuration.

Check Validate settings upon exit so Windows can find any problems with the addresses you entered. When you're finished click OK.

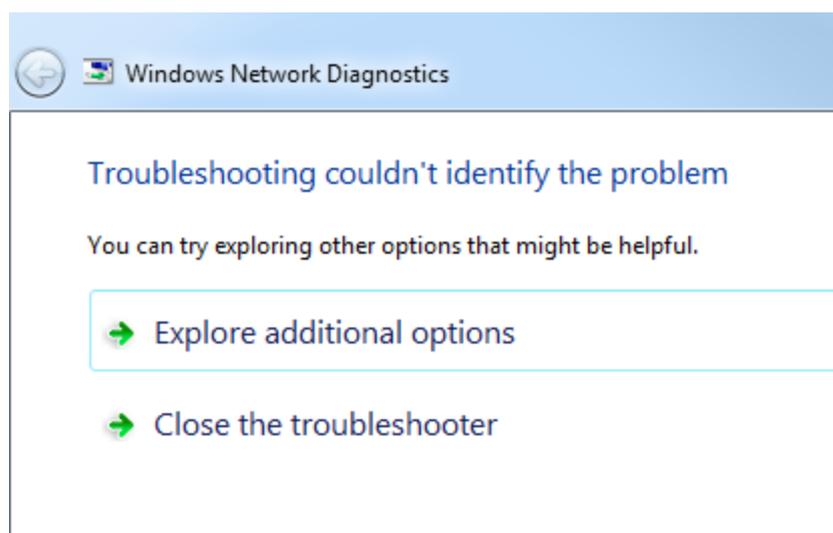


Now close out of the Local Area Connections Properties window.

Note: The Broadband Amplifier's IP address is 192.168.2.229. Your IP address must be different like 192.168.2.x. Where x is between 1 and 255, but must not be 229.



Windows will run network diagnostics and verify the connection is good. Here we had no problems with it, but if you did, you could run the network troubleshooting wizard, too.



Now you can open the command prompt by typing *cmd* in the windows search bar. A command prompt comes up. Type in *ipconfig* to see the network adapter settings have been successfully changed.

```
Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::89e7:766c:f8
    IPv4 Address. . . . . : 192.168.2.2
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :
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2.3 Starting a remote session

Open a web browser and type in the IP address of the amplifier:

 <http://192.168.2.229/>

The Operating Panel comes up:

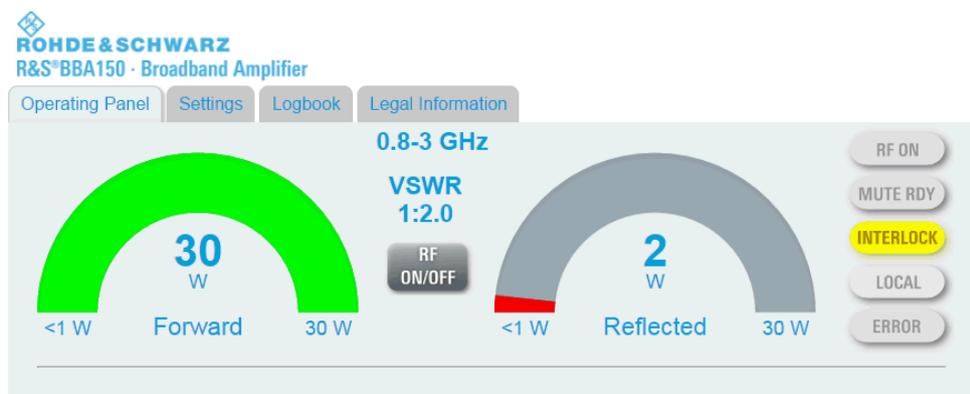


Figure 4: The Operating Panel of an R&S®Broadband Amplifier

3 Hints and advanced usage of the Web Interface: access to Amplifier Systems with more than one Amplifier

3.1 Tab Management

If you want to control many Broadband Amplifiers in parallel over the Web Interface you could feel lost in a sea of tabs. There are numerous ways to manage them in a more convenient way. The aim is to get an overview of all operating amplifiers.

The following chapter gives you an overview of different methods to arrange browser tabs automatically.

3.2 Using Windows only

Windows itself has a build in feature to sort windows automatically.



Figure 5: Example of sorted windows (left: unsorted; middle: horizontally sorted; right: vertically sorted) [1]

To use that feature open every operating panel of the broadband amplifiers in a single browser window. Do not open them in different tabs of a single window.

Click with the right mouse button on the windows task bar. Select "Show windows Stacked" (left figure) or "Show windows side-by-side" (right figure)

The advantage of that method is, that you do not need to install third party software and does not depend on the browser you are using.

4 Resources

- [1] Microsoft. windows.microsoft.com. windows.microsoft.com. [Online] Microsoft. [citation: 4. Februar 2016.] <http://windows.microsoft.com/de-de/windows/manage-multiple-windows#1TC=windows-7>.

5 Related Documents

- Product Brochure R&S®BBA150:
http://cdn.rohde-schwarz.com/pws/dl_downloads/dl_common_library/dl_brochures_and_datasheets/pdf_1/service_support_30/BBA150_bro_en_3606-7247-12_v0700.pdf
- Product Brochure R&S®BBL200:
http://cdn.rohde-schwarz.com/pws/dl_downloads/dl_common_library/dl_brochures_and_datasheets/pdf_1/BBL200_bro_en_3606-9456-12_v0300_72dpi.pdf

Rohde & Schwarz

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The electronics group is among the world market leaders in its established business fields. The company is headquartered in Munich, Germany. It also has regional headquarters in Singapore and Columbia, Maryland, USA, to manage its operations in these regions.

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Sustainable product design

- Environmental compatibility and eco-footprint
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