# Apple iPad Remote Control for Broadcasting T&M Instruments Application Note

### Products:

- | R&S<sup>®</sup>DVMS1 / DVMS4
- | R&S<sup>®</sup>DVSG
- | R&S<sup>®</sup>ETL
- | R&S<sup>®</sup>SFU / SFE / SFE100 / SFC
- | R&S<sup>®</sup>VTC / VTE / VTS

When installed on an Apple iPad\*, a remote desktop app provides a convenient way to remotely control measuring instruments over a WLAN connection.

This is especially helpful when using measuring instruments that do not have their own display such as the R&S<sup>®</sup>VTS or R&S<sup>®</sup>SFC.

The remote desktop app also gives users a detached way to control the instrument if, for example, the actual measuring instrument is installed in a place that is difficult to access.

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Apple iPad Remote Control for Broadcasting T&M Instruments

## **Table of Contents**

1	Introduction 3
2	Setup 4
2.1	Configuring the measuring instrument4
2.1.1	Windows XP4
2.1.1.1	Installing the USB WLAN adapter4
2.1.1.2	Checking the "Wireless Zero Configuration" service status5
2.1.1.3	Auto-starting the "ad hoc" WLAN network6
2.1.2	Windows 78
2.1.2.1	Checking the driver for the virtual WiFi bus8
2.1.2.2	Checking the "WLAN AutoConfig" service status9
2.1.2.3	Installing the USB WLAN adapter10
2.1.2.4	Auto-starting the "ad hoc" WLAN network10
2.2	Configuring the Apple iPad11
2.2.1	Installing the Remote Desktop – RDP app11
2.2.2	Connecting to the measuring instrument via WLAN11
2.2.2.1	Temporarily disable the "Cellular Data" setting11
2.2.2.2	Selecting the WLAN connection to the measuring instrument12
2.2.3	Configuring the Remote Desktop – RDP app12
3	Operation 14
3.1	Connecting to the measuring instrument via WLAN14
3.2	Remote desktop access to the measuring instrument14
4	References 15
5	Additional Information 15

## 1 Introduction

Remote desktop access is a convenient way to remotely control Rohde & Schwarz measuring instruments over a network. When using WLAN, this function can also be used with an Apple iPad running a remote desktop app.

One particularly appealing possibility is to set up a measuring instrument with a USB WLAN adapter. In addition to standard "infrastructure" mode for use with a dedicated access point, these adapters also support "ad hoc" mode, making it possible to connect to an iPad, without needing any additional external devices. The connection only has to be configured once. The settings are then saved so that the connection is started directly after switching on the instrument. This simplifies access to instruments without dedicated displays and offers a simple, detached solution for operating measuring instruments installed in places that are difficult to reach.



Fig. 1: Apple iPad with remote desktop app for controlling the R&S®VTS equipped with USB WLAN adapter.

This application note explains the setup and operation of the instruments with the example of the Remote Desktop – RDP app from MochaSoft [1] and the WL0049A USB WLAN adapter from LogiLink<sup>1</sup>.

The order number for R&S Sales is PD 0002.8673.00.

## 2 Setup

Because all settings are saved, the following configuration steps only have to be performed once on each measuring instrument and Apple iPad.

### 2.1 Configuring the measuring instrument

The different configuration steps depend on the operating system.

	Windows 7	Windows XP
R&S <sup>®</sup> DVMS1 / DVMS4		$\checkmark$
R&S <sup>®</sup> DVSG		Ø
R&S <sup>®</sup> ETL		$\overline{\mathbf{V}}$
R&S <sup>®</sup> SFU / SFE / SFE100 / SFC		$\overline{\mathbf{V}}$
R&S <sup>®</sup> VTC / VTE / VTS	V	

Table 1: Operating systems of the various measuring instruments.

### 2.1.1 Windows XP

### 2.1.1.1 Installing the USB WLAN adapter

The LogiLink "WL0049A" driver is provided as part of this application note. Step-bystep installation:

- 1. Unpack the Setup.exe file, copy it to the measuring instrument and run the file there
- 2. Accept the licensing terms
- 3. Select the "Install driver only" option
- 4. Quit the installer program after the installation has completed successfully
- 5. Plug in the USB WLAN adapter

If the driver is not found automatically after plugging in the USB WLAN adapter, you can manually enter the correct path "C:\windows\system\DRVSTORE\...\".



Fig. 2: Manually entering the driver path.

#### 2.1.1.2 Checking the "Wireless Zero Configuration" service status

Under "Control Panel/Administrative Tools/Computer Management", select the "Services and Applications/Services" view to ensure the "Wireless Zero Configuration" service status is "Started" and that its startup type is "Automatic".



Fig. 3: Checking the "Wireless Zero Configuration" service status.

### 2.1.1.3 Auto-starting the "ad hoc" WLAN network

To configure the "Wireless Network Connection" settings found under "Control Panel/Network Connections", right-click and open the "Properties" window.

There you will see the "General" tab where you must first select the item "Internet Protocol (TCP/IP)". Then click on "Properties" to define the static IP address as shown in Fig. 4.

Internet Protocol (TCP/IP) Proper	rties ?	×		
General		_		
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.				
<ul> <li>Obtain an IP address automatically</li> </ul>	)			
Ose the following IP address:				
IP address:	192.168.1.1			
Subnet mask:	255 . 255 . 255 . 0			
Default gateway:	· · ·			
Obtain DNS server address automatically				
Use the following DNS server addresses	resses:			
Preferred DNS server:				
Alternate DNS server:	· · ·			

Fig. 4: Configuring the static IP address.

The other settings are configured on the "Wireless Networks" tab.

🕹 Wireless Network Connection Properties 👘 🛛 🔀			
General Wireless Networks Advanced			
✓ Use Windows to configure my wireless network settings			
Available networks:			
To connect to, disconnect from, or find out more information about wireless networks in range, click the button below.			
View Wireless Networks			
Preferred networks: Automatically connect to available networks in the order listed below:			
Move up			
Move down			
Add       Remove       Properties         Learn about setting up wireless network configuration.       Advanced			
Close Cancel			

Fig. 5: Configuring the "Wireless Networks" settings.

- Make sure the top box is checked ("Use Windows to configure my wireless network settings")
- Click "Advanced" to select "Computer-to-computer (ad hoc) networks only" mode and then close the window
- 3. Click "Add" to configure the "Wireless network properties" on the "Association" tab as shown in Fig. 6 and then close the window
  - Enter the desired network name in (e.g. "SFC-100234") in the "SSID" field. Later, this network will appear in the list of options on the Apple iPad
  - b. Check "Connect even this network is not broadcasting"
  - c. Uncheck "The key is provided for me automatically"
  - Select the appropriate encryption method for the connection, e.g.
     "Open/WEP" and enter a password consisting of exactly 13 characters in the "Network key" field

Wireless network proper	rties 🛛 💽 🔀			
Association Authentication	Connection			
Network name (SSID):	SFC-100123			
✓ Connect even if this n Wireless network key	etwork is not broadcasting			
This network requires a ke	ey for the following:			
Network Authentication:	Open 💌			
Data encryption:	WEP 💌			
Network key:	•••••			
Confirm network key:				
Key index (advanced):				
The key is provided for me automatically				
This is a computer-to-computer (ad hoc) network; wireless access points are not used				
	OK Cancel			

Fig. 6: "Wireless network properties" configuration.

Close all of the windows you have opened to complete the configuration.

### 2.1.2 Windows 7

### 2.1.2.1 Checking the driver for the virtual WiFi bus

To provide automatic availability of an "ad hoc" WLAN connection after starting up the measuring instrument, the files "netwifibus.inf" and "vwifibus.sys" must be located in the "C:\Windows\inf" directory.

				- • •
Search R	esults in inf 🕨	▼ +	us*	×
Organize 🔻 Save sear	ch			•
Name	Date modified	Туре	Size	Folder
🚳 wifibus.sys 🗿 netwifibus.inf	7/14/2009 1:52 AM 7/13/2009 10:53 PM	System file Setup Information	20 KB 4 KB	inf (C:\Windows) inf (C:\Windows)
Search again in:				
詞 Libraries 🛛 📭 Compu	ter F Custom 🔏	🎒 Internet 🛛 🝺 File Co	ontents	
•	III			F
2 items				

Fig. 7: Checking whether driver for virtual WiFi bus is installed.

The two files are provided as part of this application note. If these files are not yet installed on the measuring instrument, you can simply copy them manually into the "C:\Windows\inf" folder.

### 2.1.2.2 Checking the "WLAN AutoConfig" service status

Under "Control Panel/Administrative Tools/Computer Management", select the "Services and Applications/Services" view to ensure the "WLAN AutoConfig" service status is "Started" and that its startup type is "Automatic".

🌆 Computer Management				×
File Action View Help				
				_
▶ 🔊 Performance	Name	Status	Startup Type	*
<ul> <li>Device Manager</li> <li>Storage</li> <li>Disk Management</li> </ul>	🤹 Windows Update 🏩 WinHTTP Web Proxy A 🏩 Wired AutoConfig		Disabled Manual Manual	
Services and Applications     Winternet Information Serv	WLAN AutoConfig	Started	Automatic Manual	
Services = aff WMI Control ▷ 🖙 Message Queuing	Workstation	Started	Automatic Disabled	•
Indexing Service	Extended Standard		4	

Fig. 8: Checking the "WLAN AutoConfig" service status.

### 2.1.2.3 Installing the USB WLAN adapter

See section 2.1.1.1.

### 2.1.2.4 Auto-starting the "ad hoc" WLAN network

The required "start wlan adhoc network.bat" configuration file is provided as part of this application note. After you have saved the file on the measuring instrument in the "Start menu/All Programs/Startup" directory, you can configure it by right-clicking and selecting "Edit".



Fig. 9: Configuring the "ad hoc" WLAN network.

- Enter the desired network name (e.g. "SFC-100234") in the "myssid" field. This
  network can then be selected later from the list of available networks on the
  Apple iPad
- "mypassword" is used to secure the connection

To activate the connection, run the configuration file or restart the measuring instrument.

### 2.2 Configuring the Apple iPad

### 2.2.1 Installing the Remote Desktop – RDP app



Fig. 10: The app can be installed directly from the Apple App Store [1].

### 2.2.2 Connecting to the measuring instrument via WLAN

### 2.2.2.1 Temporarily disable the "Cellular Data" setting



Fig. 11: Disabling the "Cellular Data" setting causes the Apple iPad to use only WLAN for data traffic.

Configuring the Apple iPad

### 2.2.2.2 Selecting the WLAN connection to the measuring instrument



Fig. 12: Selecting the WLAN connection to the measuring instrument.

If the measuring instrument is running Windows XP (see 2.1), a static IP address must also be assigned (once) in the connection settings of the Apple iPad as shown in Fig. 13.

Settings	Wi-Fi Networks	SFC-100123	
Airplane Mode OFF			
SFC-100123		Forget this Network	
Notifications	Auto-Join		
Location Services Off	IP Address		
Brightness & Wallpaper	DHCP	BootP	Static
Picture Frame			
General	IP Address		192.168.1.2
🛆 iCloud	Subnet Mask		255.255.255.0
🔄 Mail, Contacts, Calendars	Router		
<b>Solution</b> Twitter	DNS		
S FaceTime	Search Domains		
Mafari Safari	HTTP Proxy		
O Messages	Off	Manual	Auto

Fig. 13: Configuring the static IP address.

### 2.2.3 Configuring the Remote Desktop – RDP app

After starting the app, select "New...." to create a connection profile for a new measuring instrument.

Mocha RDP	Configure
Tasks	
Connect >	Add a configuration
Configure >	

Fig. 14: Creating a new connection profile.

Configuring the Apple iPad

Next, the following screen appears:

Mocha RDP	Configure	Help
Tasks	Windows PC	
Connect >	PC Address PC name or IP address	<required></required>
Configure >	PC Port Default port is 3389	3389
Delete and Move >	PC User (optional) User ID for the Windows PC	<optional></optional>
Add another PC >	PC Password (optional) Typing a password here, gives less security	<optional></optional>
More	Mac Address (optional) Only used for WOL (Wake on LAN)	<optional></optional>
Quick Guide >	WOL port Wake on LAN port (optional)	9
About >	WOL broadcast Wake on LAN uses broadcast	
Help > Setup wizard for PC >	WOL send ping Wake on LAN uses ping	ON
	Name (optional) Any alias name for the session	<optional></optional>
	Terminal Server Use a Windows Server 200x	OFF

Fig. 15: Configuration screen for a new connection profile.

The following settings must be configured:

- 1. The "PC Address" field can be filled in automatically with the currently active WLAN connection by clicking the blue button
- 2. The "PC User" is "instrument" and is the same for all measuring instruments
- 3. The "PC Password" is found in the manual of the particular measuring instrument
- 4. The default value of "800 x 600" for "Screen size" is appropriate for most measuring instruments. Exceptions are listed in the following table:

	Horizontal	Vertical
R&S <sup>®</sup> DVMS1 / DVMS4	1024	768
R&S <sup>®</sup> ETL	1024	768
R&S <sup>®</sup> VTC	1368	1026

Table 2: Recommended remote desktop resolution for different measuring instruments.

1368 x 1026 - customize size>	٥
2048 x 1536	

Fig. 16: The "customize size" function supports custom resolutions.

Connecting to the measuring instrument via WLAN

## 3 Operation

3.1 Connecting to the measuring instrument via WLAN

See section 2.2.2.

### 3.2 Remote desktop access to the measuring instrument

1. Select landscape format and use the multitasking bar to lock this format:



Fig. 17: The icon on the left in the multitasking bar enables the rotation lock for the view.

- 2. Start the Remote Desktop RDP app
- 3. Select the measuring instrument from the "Connect" list

Tasks		
Connect	>	/RSSFC-100105
Configure	>	

Fig. 18: "Connect" list for connecting to a previously configured measuring instrument.

4. Disable screen scrolling by tapping the "Lock screen" icon:

QWERTY ke	yboard	Menu	Zoom out		Hide tool bar
	Extra keys	;   F	Return key	Locks	screen
			ب E	i e	

Fig. 19: Menu bar during the remote desktop connection

 If you are remotely controlling an R&S<sup>®</sup>ETL, press the "F6" key once to emulate the soft keys in the remote desktop app



If you are using the WLAN connection in "ad hoc" mode as described in Chapter 2, the Apple iPad should not be more than ten meters away from the measuring instrument. Otherwise, the connection will be dropped automatically. For larger ranges, it is recommended to use "Infrastructure" mode with an additional access point.

## 4 References

[1] "Remote Desktop – RDP" by MochaSoft http://itunes.apple.com/app/remote-desktop-rdp/id288362053?mt=8

## 5 Additional Information

Our Application Notes are regularly revised and updated. Check for any changes at <a href="http://www.rohde-schwarz.com">http://www.rohde-schwarz.com</a>.

Please send any comments and suggestions about this Application Note to Broadcasting-TM-Applications@rohde-schwarz.com

### 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.

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- ISO 14001-certified environmental management system



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