

Quick Start Guide

R&S[®] DVM50/100/100L/120 MPEG2 MONITORING SYSTEM DIGITAL VIDEO MEASUREMENT SYSTEM

The Operating Manual the following models and options of the
MPEG2 MONITORING SYSTEM and
DIGITAL VIDEO MEASUREMENT SYSTEM:

- ◆ R&S® DVM50 2085.1900.03
- ◆ R&S® DVM100 2085.1600.03
- ◆ R&S® DVM100L 2112.7050.02
- ◆ R&S® DVM120 2085.1700.03

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81671 Munich, Germany, 2007

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Certificate No.: 2007-08

This is to certify that:

Equipment type	Stock No.	Designation
DVM50	2085.1900.03	MPEG2 Monitoring System
DVM100	2085.1600.03	
DVM120	2085.1700.03	
DVM-B1	2085.3283.02	Analyzer Board
DVM-B520	2085.5640.02	Integration Set for DVM-B52

complies with the provisions of the Directive of the Council of the European Union on the approximation of the laws of the Member States

- relating to electrical equipment for use within defined voltage limits (2006/95/EC)
- relating to electromagnetic compatibility (2004/108/EC)

Conformity is proven by compliance with the following standards:

EN 61010-1 : 2001
EN 61326 : 1997 + A1 : 1998 + A2 : 2001 + A3 : 2003
EN 55011 : 1998 + A1 : 1999 + A2 : 2002, Klasse B
EN 61000-3-2 : 2000 + A2 : 2005
EN 61000-3-3 : 1995 + A1 : 2001

For the assessment of electromagnetic compatibility, the limits of radio interference for Class B equipment as well as the immunity to interference for operation in industry have been used as a basis.

Affixing the EC conformity mark as from 2007

ROHDE & SCHWARZ GmbH & Co. KG
Mühldorfstr. 15, D-81671 München

Munich, 2007-08-23

Central Quality Management MF-QZ / Radde



Certificate No.: 2007-09

This is to certify that:

Equipment type	Stock No.	Designation
DVM100L	2112.7050.02	MPEG2 Monitoring System
DVM-B1	2085.3283.02	Analyzer Board
DVM-B520	2085.5640.02	Integration Set for DVM-B52
DVM-B60	2085.5586.02	DC/DC 48V Converter

complies with the provisions of the Directive of the Council of the European Union on the approximation of the laws of the Member States

- relating to electrical equipment for use within defined voltage limits (2006/95/EC)
- relating to electromagnetic compatibility (2004/108/EC)

Conformity is proven by compliance with the following standards:

EN 61010-1 : 2001
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EN 55011 : 1998 + A1 : 1999 + A2 : 2002, Class B

For the assessment of electromagnetic compatibility, the limits of radio interference for Class B equipment as well as the immunity to interference for operation in industry have been used as a basis.

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1 Putting into Operation

Overview

- Chapter 1** This chapter contains all information about putting the instrument into operation (unpacking, connection to AC supply, switching on and off), function check, installation of the instrument in a rack, and describes default settings.
- Chapter 2** This chapter describes the instrument's controls and the connectors using front- and rear-panel views. Connection of external devices such as printer, keyboard, mouse and monitor is also explained. Specifications for the interfaces are contained in the data sheet. Chapter 2 "Brief Introduction" provides an overview of the instrument's functions and operating concept.

CD-ROM

The CD-ROM contains the complete manual with additional chapters in a format you can print (PDF).
The CD-ROM contains also the Installation Instructions for Options.

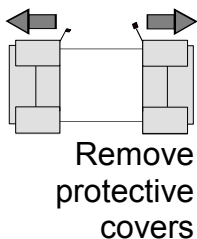
1.1 Notes on Putting into Operation

Prior to putting the instrument into operation, check the following:

- ◆ The instrument cover is in place and screwed on.
- ◆ Vent holes are not obstructed.
- ◆ The signal levels at the inputs do not exceed permissible limits.
- ◆ The outputs of the instrument are not overloaded or incorrectly connected.

Any non-compliance with these precautions may cause damage to the instrument.

1.1.1 Unpacking the Instrument



- ◆ After unpacking the instrument, check the supplied equipment against the delivery note and the lists of accessories to make sure that it is complete.
- ◆ Remove the two protective covers at the front and the rear and carefully check the instrument for possible damage.

Should there be any damage, inform the carrier immediately and keep the packaging to support all subsequent claims. The original packaging is also useful for transporting or shipping the instrument later on. Keep at least the two protective covers to protect front and rear panel and the connectors from being damaged.

1.1.2 Positioning the Instrument

For use in the lab or on a workbench, fold out the feet at the bottom of the unit.

**Important:**

The feet must be fully folded in or folded out. Only then can a stable position of the instrument and reliable operation be ensured. When the feet are folded out, the weight of other instruments that might be placed on top of the R&S® DVM must not exceed 30 kg. These units must be secured against slipping (e.g. by locking the feet to the top of the R&S® DVM housing).

When the instrument is shifted with the feet out, the feet might fold in. To avoid injuries, the unit must therefore not be shifted with the feet out.

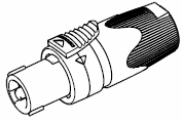
1.1.3 AC Supply

The instrument can be operated from 100 V to 120 V and 200 V to 240 V AC at frequencies from 50 Hz to 60 Hz. The AC supply connector is located at the rear of the unit. The autoranging function automatically adapts to the applied voltage by selecting one of the two permissible voltage ranges. Adjusting the instrument to a particular AC supply voltage is therefore not required.

1.1.4 DC Supply



The instrument is optionally equipped with a -48 V DC input for the power supply. The permitted input voltage range is -38 V to -65 V.



The maximum current drain depends on the input voltage and has the following values:

- ◆ up to 3.6 A at -38 V
- ◆ up to 2.1 A at -65 V



The instrument is supplied with a connector for the customer's power supply.

The allocation is as follows:

Pin 1+ = open

Pin 1- = ground-earth

Pin 2+ = 0 V (ground-power supply)

Pin 2- = -48 V



Important:

The DC power supply cable must not be longer than 20 m and must not be run outside the building. In this case, an external lightning protection system must be provided.

The used power supply (SELV) must fulfill the requirements for reinforced/double insulation for main supply circuits in accordance to DIN/EN/IEC 61010-1 (UL61010B-1, CSA/CAN C22.2 Nr. 61010,1) or DIN/EN/IEC 60950-1 (UL60950-1, CSA/CAN C22.2 Nr. 60950-1).

Before switching on the instrument check the connection for correct polarity.

(+ = groundet).

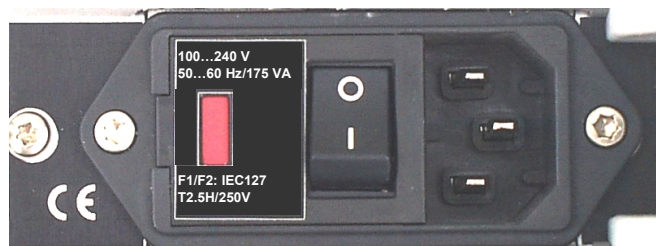
1.1.5 EMC Safety Precautions

To prevent electromagnetic interference, the instrument must be operated only when closed and with all shielding covers fitted. Only suitable and shielded signal and control cables may be used. This applies in particular to cables that are connected to the ASI inputs and outputs. Depending on the data rate and the packet timing of the transport stream, high levels may occur sporadically within the signal spectrum. To avoid EMC problems, these cables should therefore have at least 80 dB to 1 GHz shielding. This is usually achieved by means of double-shielded cables.

1.1.6 Fuses

The AC input of the instrument is protected by two fuses (see type label). The fuses are located next to the main switch at the rear of the instrument.

Figure 1-1 Fuses



R&S® DVM50/100/100L/120

1.1.7 Installation in a 19" Rack

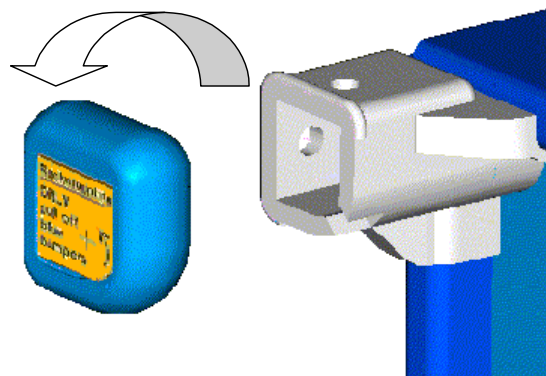
**Important:**

When the instrument is installed in a rack, make sure that the vents for air intake in the front and side panels and the air outlets at the instrument rear are not obstructed.

To mount the unit in a rack, remove the blue foot pads from the grey plastic part.

Do not undo the fastening screws in the unit feet.

Figure 1-2 Foot pads



1.2 Switching the Instrument On and Off

Figure 1-3 On/off switch at the rear of the instrument



Switching on:

- ◆ Set switch to position I; the instrument is ready for operation.

Switching off:

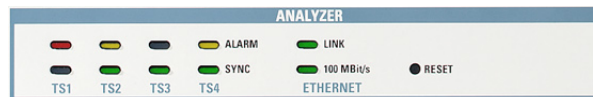
- ◆ Set switch to position 0.

1.2.1 Switch-On State

When the instrument is switched on, the status set when the instrument was previously switched off is automatically restored.

1.2.1.1 Non-Volatile RAM

A battery-backed RAM is provided in the instrument for storing internal instrument data. The RAM and the system clock are powered from a lithium battery with a lifetime of approx. 5 years. When the battery is depleted, the stored data is lost. Changing the battery is described under Repairs in the Service Manual.



ANALYZER

TS1 to TS4 – Signal status of inputs 1 to 4

◆ ALARM

- off no alarm
- red no transport stream or alarm signal present
- yellow an alarm signal was detected but is no longer active

◆ SYNC

- green transport stream present
- off no transport stream

ETHERNET – Status of analyzer control

◆ LINK

- green link established
- off no connection

◆ 100 Mbit/s

- green max. data rate 100 Mbit/s
- off max. data rate 10 Mbit/s

RESET

Key for restarting the analyzer (may be required during setup or extension of a system to register the analyzers). Actuate by means of a blunt pin.

2.1.2 Front Panel of R&S® DVM120

Figure 2.1-2 Front Panel of R&S® DVM120



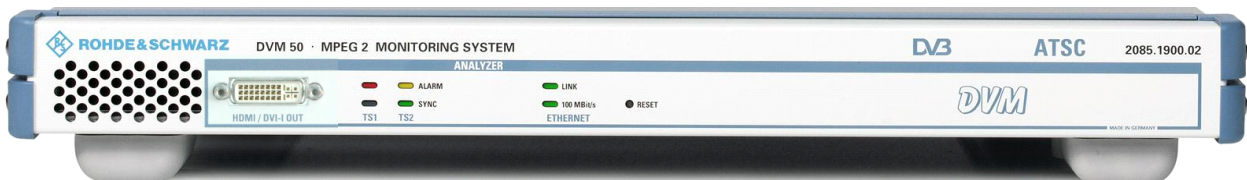
The LEDs of the two analyzers are identical to those of the R&S® DVM100 analyzer (see above).

Model 03 instruments which are equipped with a hardware decoder include a DVI-I output on the front panel.



2.1.3 Front Panel of R&S® DVM50

Figure 2.1-3 Front Panel of R&S® DVM50



The LEDs of the analyzer are identical to those of the R&S® DVM100 analyzer (see above).

Model 03 instruments which are equipped with a hardware decoder include a DVI-I output on the front panel.



2.2 Legend for Rear View

2.2.1 Rear Panel of R&S® DVM100/DVM100L

Figure 2.2-1 Rear Panel of R&S® DVM100/DVM100L



CONTROLLER interfaces



ALARM LINES

15-contact female connector
12 relay outputs that can be assigned to one or more (ORed) events.



VGA MONITOR

15-contact female connector for a PC monitor.



USB



100 BASE-T

RJ-45 female connector
for remote control of the entire system via the network.



100 BASE-T

RJ-45 female connector
of controller for connecting one or more analyzers via a local private network.



Important:

The "private network" is an IP-based Ethernet network that is allowed to contain only R&S® DVM analyzers. This is the only way to achieve the required data rate. On the other hand, the R&S® DVM controller contains a DHCP server for automatic assignment of IP addresses which might create conflicts if the public network contains a DHCP server as well.



Figure 2.2-2 Rear Panel of R&S® DVM100/DVM100L

ANALYZER interfaces



100 BASE-T

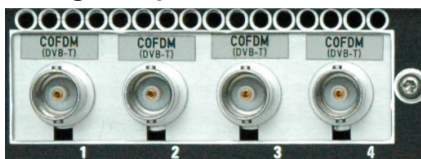
RJ-45 female connector of analyzer for connection to the controller via a local private network.



Optional signal interfaces

For instruments equipped with an RF interface, the female RF input connectors are located here. The design depends on the modulation standard.

RF signal inputs



- ◆ BNC male connector for R&S® DVM-B50 (DVB-C, J83.A/B and R&S® DVM-B52 (DVB-T)
- ◆ F male connector for R&S® DVM-B51

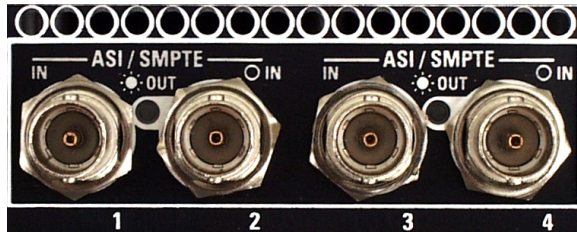
For instruments equipped with a hardware decoder, the signal outputs for analog audio and digital video SDI are located here.



Optional – for future extensions



TS inputs on instruments without RF receiver



TS ASI / SMPTE 310

BNC connectors, female
Transport stream input and output

- ◆ ASI (asynchronous serial interface) in line with DVB DOCUMENT A010 and
- ◆ SMPTE-310M (synchronous serial) (19.392658 Mbit/s).

1. TS input 1
 2. TS input 2 or alternatively
TS output (TS from input 1 actively looped through - LED OUT)
 3. TS input 3
 4. TS input 4 or alternatively
TS output (TS from input 3 actively looped through - LED OUT)
- The use of the inputs depends on the option (see data sheet).

TS inputs on instruments with RF receiver



TS ASI / SMPTE 310

BNC connectors, female
Transport stream input and output

- ◆ ASI (asynchronous serial interface) in line with DVB DOCUMENT A010 and
- ◆ SMPTE-310M (synchronous serial) (19.392658 Mbit/s).
For instruments equipped with an RF receiver, all four transport stream interfaces can be configured either as inputs or outputs. Thus, it is possible to output the demodulated transport stream of an RF receive module via an unused TS input interface.



Figure 2.2-3 Rear Panel of R&S® DVM100/DVM100L

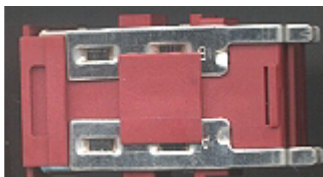
AC supply connector, switch and fuses



100 .. 240V
50 .. 60 Hz/60VA
F1/F2:IEC127
T2.0 H/250V

Automatic voltage selection.

To replace the fuses,
disconnect the power plug and
open the fuse cover on the
side.



Remove defective fuse from
the fuse holder and replace it.

2.2.2 Rear Panel of R&S® DVM120

Figure 2.2-4 Rear Panel of R&S® DVM120



The interfaces of the two analyzers are identical to those of the R&S® DVM100 analyzer (see above).

2.2.3 Rear Panel of R&S® DVM50

Figure 2.2-5 Rear Panel of R&S® DVM50



The interfaces of the analyzer are identical to those of the R&S® DVM100 analyzer (see above).

2.2.4 Setting Up and Configuring a New DVM System

The base component of a R&S® DVM system is the R&S® DVM100. It contains a controller and an analyzer for monitoring up to 4 transport streams. If more transport streams have to be analyzed, the system can be expanded by adding one or two R&S® DVM120.

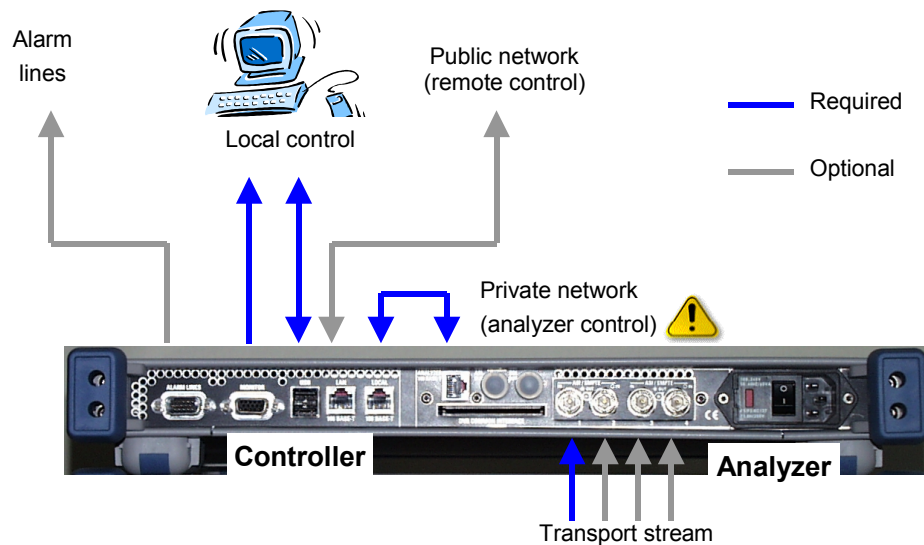
The analyzers are connected to the controller via an IEEE802.3 Ethernet-based private network. The base system – which contains only one analyzer – can be directly connected by means of the crossed Ethernet cable supplied with the R&S® DVM100. Expanded systems – containing several analyzers - are connected via an Ethernet hub. Operation is via an XVGA monitor with keyboard and mouse connected to the controller.

After interconnecting the hardware, a basic configuration has to be performed so that the connected analyzers are made known to the system and can be used for analysis.

2.2.4.1 System with R&S® DVM100

If a system contains only one R&S® DVM100, the analyzer can be directly connected to the controller. A crossed Ethernet cable such as the one supplied with the R&S® DVM100 must be used in this case.

Figure 2.2-6 Connections of basic configuration of R&S® DVM100



IMPORTANT

The "private network" is an IP-based Ethernet network that is allowed to contain only R&S® DVM analyzers. This is the only way to achieve the required data rate. On the other hand, the R&S® DVM controller contains a DHCP server for automatic assignment of IP addresses which might create conflicts if the public network contains a DHCP server as well.



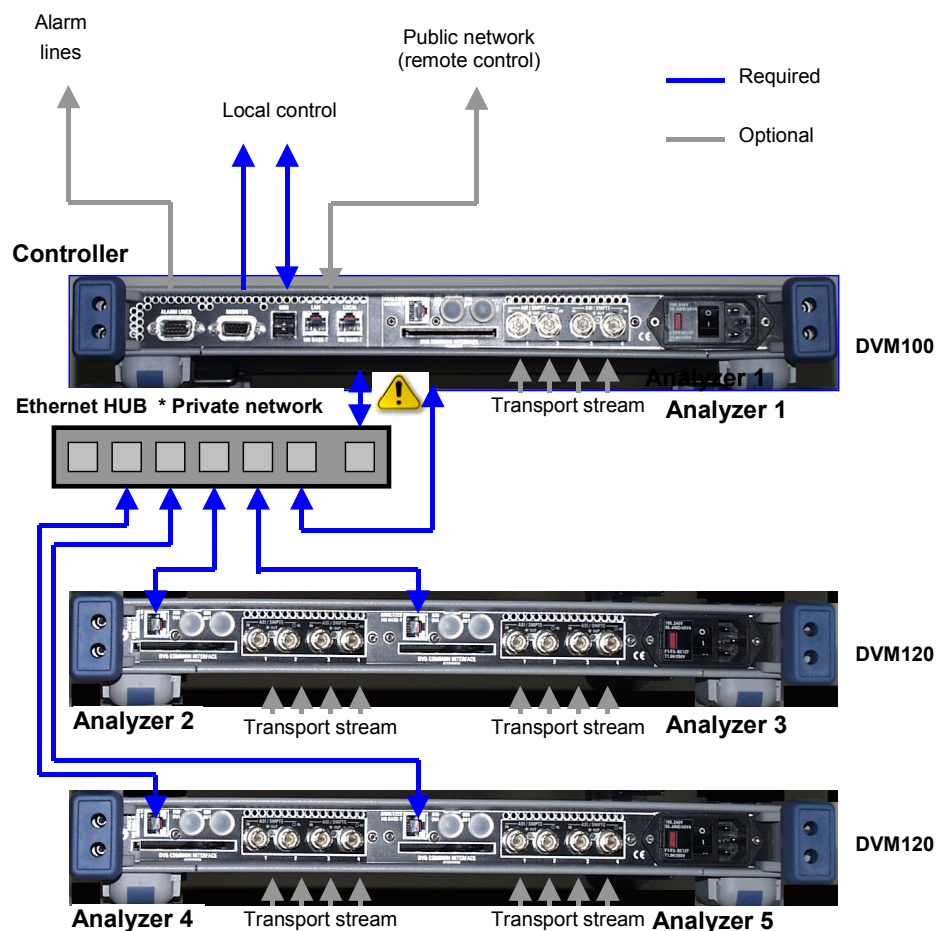
NOTE

A local control monitor is not always required for operation of the R&S® DVM. The system can also be controlled via the remote-control interface. For further information refer to chapter "Remote Control".

2.2.4.2 System with R&S® DVM100 and R&S® DVM120

In a system containing both the R&S® DVM100 and the R&S® DVM120, the analyzers are connected to the controller via an Ethernet hub. All 100 Mbit/s-compatible hubs in line with standard IEEE802.3 can be used. We recommend to use hubs with automatic identification of the line configuration. If such a hub is not available, uncrossed Ethernet cables must be used.

Figure 2.2-7 Connections of an R&S® DVM100 + R&S® DVM120 basic configuration



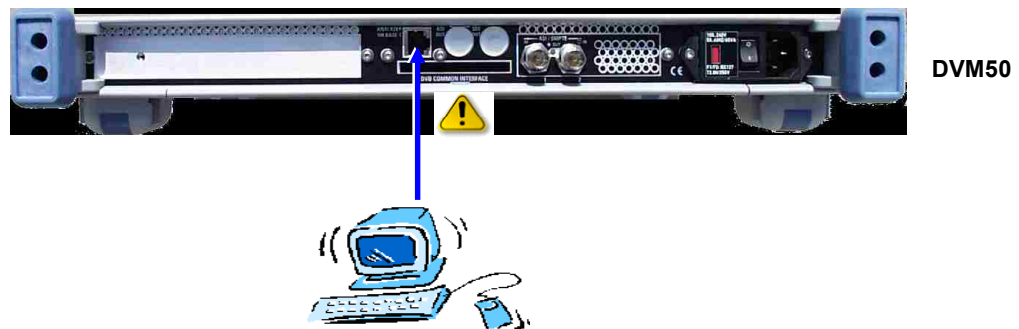
IMPORTANT

The "private network" is an IP-based Ethernet network that is allowed to contain only R&S® DVM analyzers. This is the only way to achieve the required data rate. On the other hand, the R&S® DVM controller contains a DHCP server for automatic assignment of IP addresses which might create conflicts if the public network contains a DHCP server as well.

2.2.4.3 System with R&S® DVM50 and PC

In a system containing both the R&S® DVM50 the analyzer are connected to the controller via an Ethernet cable.

Figure 2.2-8 System with R&S® DVM50 and PC



IMPORTANT

The "private network" is an IP-based Ethernet network that is allowed to contain only R&S® DVM analyzers. This is the only way to achieve the required data rate. On the other hand, the R&S® DVM controller contains a DHCP server for automatic assignment of IP addresses which might create conflicts if the public network contains a DHCP server as well.

2.3 Notes on Putting into Operation

R&S® DVM50

To operate the device, you must have a PC running Microsoft Windows XP that is equipped with an Ethernet adapter. This section describes how to install DVM Controller Software on the PC and how to configure the R&S® DVM 50 for operation in the network.

2.3.1 System Requirements

We recommend the following minimum requirements for the DVM Controller PC:

- ◆ Intel Pentium III, 700 MHz
- ◆ 256 Mbyte RAM, 1 Gbyte free hard disk space
- ◆ Screen resolution 1024 x 768
- ◆ Microsoft Windows XP Service Pack 1

2.3.2 Installing DVM Controller Software

To install DVM Controller Software:

- ◆ Uninstall any existing DVM Controller Software versions from the PC (refer to the following section).
- ◆ Start the installation routine by double-clicking *DVM50Setup_xxx(Release).exe* in the folder: *software_CD-Install\cont_sw_dvm50* on the CD-ROM, and then follow the instructions. The DVM Controller Software is installed in the default Windows folder for programs.
- ◆ Click the *DVM* icon on the desktop to start the DVM Controller Software.

2.3.3 Uninstalling DVM Controller Software

Use the *Software* category in the Windows XP Control Panel to uninstall DVM Controller Software.

2.3.4 Configuring the Device

Before the device can be remotely controlled from a PC, the network parameters must be set using the provided *DVM Analyzer Network Configuration* program. These settings are stored permanently in the device. Reconfiguration of the R&S® DVM 50 is then necessary only if the network environment changes. The R&S® DVM 50 must be in its default state to set the network parameters.

2.3.5 Restoring the Default Device Settings

If the R&S® DVM 50 is already in its default state (as is the case when the device is first delivered), you can skip to the following section.

To restore the default device settings:

- ◆ Turn on the device. A few seconds later, all TS LEDs (ALARM and SYNC) should light yellow. While all LEDs are still lit yellow, turn off the device.
- ◆ Repeat this step a second time.

The device is now in its default state and the network parameters can be set.

**Note:**

Instead of the steps described above, you can also use a blunt object (such as a pen) to press the Reset key on the front of the device while the yellow TS LEDs are lit. Wait until the yellow LEDs have extinguished and lit again before pressing the Reset key a second time.

2.3.6 Setting the Network Parameters

To configure the network parameters, connect the R&S® DVM 50 to a Windows XP PC using the provided crossed Ethernet cable. It does not matter whether the PC used for the network configuration is the same one that the R&S® DVM 50 will run on later. You do have to ensure, though, that the PC used for the network configuration has a valid IP address.

Switch on the R&S® DVM 50 and start the *DVM Analyzer Network Configuration.exe* program located in the software_CD-Install\confi_tools folder on the installation CD-ROM. This opens the following dialog box:

Figure 2.3-1 DVM Analyzer Network Configuration

The screenshot shows the 'DVM Analyzer Network Configuration' dialog box. It contains instructional text on the left and configuration fields on the right. The 'Temporary Analyzer Connection' section includes a dropdown for 'Network Adapter' (Intel(R) PRO/1000 MT Network Connection), 'Local Address' (89 . 12 . 3 . 243), 'Peer Address' (89 . 0 . 0 . 1), and 'Analyzer MAC Address' (00-90-b8). The 'Analyzer Configuration Parameters' section includes 'Analyzer IP Address' (89 . 0 . 0 . 1), 'Subnet Mask' (255 . 0 . 0 . 0), 'Default Gateway' (89 . 0 . 0 . 2), 'Controller PC IP Address' (89 . 12 . 3 . 243), and 'NTP Server' (89 . 12 . 3 . 243). 'Start' and 'Exit' buttons are at the bottom right.

You might find that some of the entry fields are grayed out on your PC. If you have more than one network adapter installed on your PC, check to ensure that the adapter defined in the *Network Adapter* field is the one that is connected to the R&S® DVM 50. If so, the *Local Address* field should contain the IP address for that adapter. It can take a few seconds after the R&S® DVM 50 is switched on before the network connection is recognized. During this time, the entry fields will be grayed out.



If the entry fields are still grayed out after checking the above items, you should check the following:

- ◆ Is the device in the default state? If you are not sure, try to reset the R&S® DVM 50 to its default state (see above).
- ◆ Did you use the crossed network cable that was provided with the device for the connection between the R&S® DVM 50 and the PC? The network parameters can be set only with a crossed network cable that directly connects the R&S® DVM 50 to the PC.
- ◆ Does the PC have a valid IP address? The PC's IP address should not be assigned dynamically during the network configuration.

Is a DHCP Server service or program running on the PC, or is the PC connected to a network that provides the DHCP service? Check to ensure that the R&S® DVM 50 cannot access a DHCP service while you are setting the network parameters.

After the R&S® DVM 50 is switched on, the entry fields are prefilled with valid values for the eventuality that the R&S® DVM 50 will be run on this PC. In this case, you simply have to enter the *Analyzer MAC Address* that can be found on the rear panel of the R&S® DVM 50. In all other instances, all entry fields in the *Analyzer Configuration Parameters* section must be completed individually.

The entry fields are described here:

Network Adapter:	Select the network adapter connected to the R&S® DVM 50.
Local Address:	The IP address of the selected network adapter. This is filled in automatically by the program and is for informational purposes only.
Peer Address:	This IP address is temporarily assigned to the R&S® DVM 50 while the network parameters are being set. This must be a valid IP address from the subnet range of the PC being configured. There normally is no reason to change the address provided here.
Analyzer MAC Address:	The MAC address or the Ethernet address of the R&S® DVM 50. This address is found on the rear panel of the device and must be entered in the format XX-XX-XX-XX-XX-XX.
Analyzer IP Address:	This IP address is assigned to the R&S® DVM 50 for operation. This setting is stored permanently.
Subnet Mask:	The subnet mask of the network in which the R&S® DVM 50 will run. This setting is stored permanently.
Default Gateway:	The default gateway of the network in which the R&S® DVM 50 will run. This setting is stored permanently.
Controller PC IP Address:	The IP address of the PC on which DVM Controller Software is installed. This setting is stored permanently.
NTP Server:	The IP address of an optional NTP server. This setting is stored permanently. Refer also to the following section regarding the Network Time Protocol (NTP).

Finally, click *Start* to save the settings for the R&S® DVM 50. If the *Start* button is unavailable, then at least one of the entry fields is incomplete. Successful completion of the configuration process is acknowledged with a confirmation dialog. The R&S® DVM 50 can now be switched off. The new settings will take effect the next time the device is switched on.



Note:

You do not need to reset the R&S® DVM 50 to its default state if you know the last IP address that was set in the R&S® DVM 50, and if the configuring PC is in the same subnetwork as the R&S® DVM 50. Simply enter the IP address of the R&S® DVM 50 as the Peer Address in the appropriate entry field of the configuration program when setting the network parameters. In this case, you do not need the direct connection with the crossed network cable between the R&S® DVM 50 and the configuring PC.

2.4 Notes on the Operating System and Firmware Update

2.4.1 Installation of the Software

**Caution:**

Only software authorized by Rohde & Schwarz for use in the R&S® DVM may be installed. In case of doubt, please contact your local Rohde & Schwarz representative.

- ◆ Changes to the system are only permissible in agreement with Rohde & Schwarz.
- ◆ Updating the operating system, e.g. installing a service pack, is not allowed without permission.

Otherwise the stability and performance of the system may be impaired. Rohde & Schwarz shall not assume any liability for faults caused by impermissible manipulations of the system.

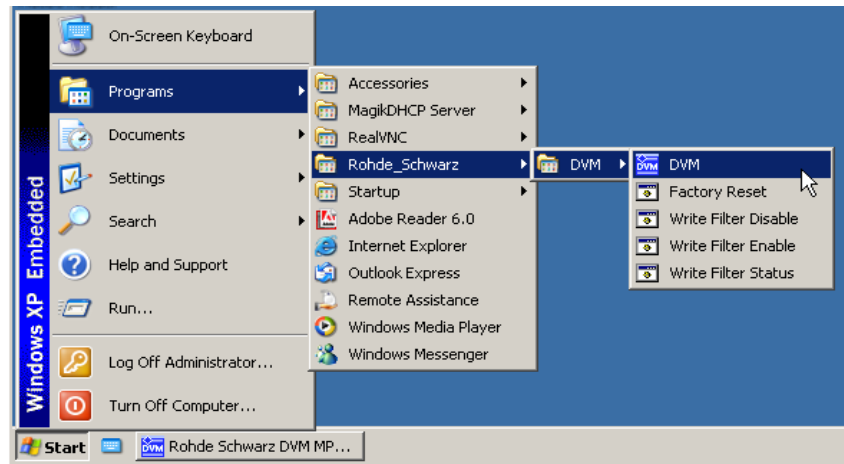
2.4.2 XP Embedded Operating System

Model 02 instruments are equipped with write protection for the system's C:\ hard disk. This function is no longer supported as of model 03. Secure continuous operation is ensured even without write protection. You should also now refrain from activating write protection for old instruments as well.

In model 02 instruments, you can do this via the following functions.

The following tools are available for this purpose under:
“Start → Programs → Rohde & Schwarz → DVM”:

Figure 2.4-1



Write Filter Disable	Disable the write filter
Write Filter Enable	Enable the write filter
Write Filter Status	Check the write filter

The tool opens up a text file containing the following information:

- ◆ **State** Current status of the write filter
 - **ENABLED** → Write filter is ON
 - **DISABLED** → Write filter is OFF

- ◆ **Boot Command** Status after rebooting the system
 - **NO_CMD** → No change
 - **ENABLE** → Write filter is ON
 - **DISABLE** → Write filter is OFF

Note that changes do not go into effect until after the system is rebooted.

You can check the current status with the following tool:



Caution:

Changes to the system (e.g. resetting the IP address) should be made only with write protection switched off. Otherwise, the change will be lost when the system is switched off.

2.4.3 Setting the System Time

You can set the system time using the Windows Desktop.
Setting the time of day:

- ◆ Open the Windows XP dialog box with
Start → Settings → Control Panel → Date and Time
- ◆ Sets the date and time.
Setting the regional and language options:
- ◆ Open the Windows XP dialog box with
Start → Settings → Control Panel → Regional and Language Options
- ◆ Select the country on the **Regional Options** tab under **Standards and formats**.



Important:

This setting will directly affect only the time and date display in Windows XP Desktop. In order to synchronize the time references of the connected analyzers, the application must be restarted after the time is adjusted.

2.4.4 Checking the Analyzer Time

R&S® DVM analysis boards have their own time reference. It is adjusted via an internal NTP server (NTP = Network Time Protocol) to the system time of the controller.

Checking the synchronization:

- ◆ Open the R&S® DVM dialog box with
HELP → Analyzer Info → Site Configuration
- ◆ Select Analyzer under the **Analyzer Info** tab and click on the **Show Info** button.
- ◆ Check the time of day and status of the NTP synchronization under **Clock**.

Larger time deviations (e.g. after adjusting the system time) will require you to restart the application.

2.4.5 Linking the System Time to an External Time Server



Caution:

Switch off the XP write protection before making a change!

It is possible to link the system time to an external time server of an IP network. To do this, you need to enter its IP address in the file `C:\Windows\ntp.conf` and declare it as “prefer”.

Figure 2.4-2 An excerpt from `C:\Windows\ntp.conf`

No link to an external server	Link to NTP server with IP address 120.34.56.78
<pre>... . # # server 127.0.0.1 prefer fudge 127.0.0.1 stratum 12 # #</pre>	<pre>... . # # server 120.34.56.78 prefer server 127.0.0.1 fudge 127.0.0.1 stratum 12 # #</pre>

2.4.6 Configuring an External Keyboard



Caution:

Switch off the XP write protection before making a change!

If so desired, you can connect an external keyboard to the USB interface. When delivered, the R&S® DVM is preconfigured for an English US keyboard.

Changing to a different country code:

- ◆ Open the Windows XP dialog box with Start → Settings → Control Panel → Regional and Language Options
- ◆ Select the **Language** tab and use the **Details** button to open the **Text Services and Input Languages** menu box.
- ◆ Use the **Add...** switch to add the desired input language and desired keyboard layout.
- ◆ Select from the available options and confirm your choice.



If several keyboard codes are configured, you can select among them using the Windows taskbar.

If no keyboard is available, you can enter characters via a screen-based keyboard using the mouse.



The screen-based keyboard is activated using the keyboard icon in the taskbar.

2.4.7 Firmware Update

**Caution:**

Switch off the XP write protection before making a change!

The following steps are required to install new R&S® DVM firmware. If you do not follow these steps, there is a risk of losing information which identifies the instrument configuration.

2.4.7.1 Updating the Instrument Firmware

You will need the following for the update:

- ◆ New firmware “**DVMxxxSetup_yyy(Release).exe**” and installation routine “**DVMxxxSetup_yyy..cmd**”.
- ◆ Mouse and keyboard (if not available, the onscreen keyboard can also be used)
- ◆ External PC with network interface or USB stick for transmitting the firmware to the instrument
- ◆ For R&S® DVM400: Before starting the update, make sure the instrument is equipped with an MPEG analyzer (R&S® DVM400-B1 option) and the TS generator option (R&S® DVM400-B2 option).

How to perform the update:

- ◆ Deactivate write protection for drive C:
Use **Start → Programs → Rohde_Schwarz → DVM → Write Filter Disable**.
Restart Windows.
Only for instruments up to model 02.
- ◆ Exit the R&S® DVM application using the menu File→Exit.
- ◆ Copy the new instrument firmware “**DVMxxxSetup_yyy(Release).exe**” and install file “**DVMxxxSetup_yyy..cmd**” to the directory C:\Transfer. This can take place via the network interface (see FTP support) or using a suitable device via the USB interface.
- ◆ Install the new firmware by double-clicking the previously installed file “**DVMxxxSetup_yyy..cmd**”
- ◆ Follow the instructions until the installation is complete.

After the initial start of the application, the firmware of all connected TS analysis boards and RF boards will be automatically updated. This process may take several minutes. The update status is indicated in the site tree of the screen interface.

2.4.7.2 Starting the Application and Checking the Version

- ◆ Start the R&S®DVM application using the **DVM** icon on the desktop.
- ◆ In the site tree (top left), the connected analyzer will be displayed with the **[?]** icon so that it can be registered.



Important:

It can take up to one minute for the analyzer to appear after an update.

- ◆ Register the analyzer with the application. To do this, click on the icon with the **right mouse button** and open the **Add Analyzer** dialog. If so desired, you can modify the proposed settings at this point. You can also wait until later to do this. Close the **Add Analyzer** and **Site Configuration** dialog.
- ◆ **Check the version of the instrument firmware:**
In the R&S®DVM application, use **Help → About DVM** to open the **About DVM** dialog.
- ◆ **Checking the analyzer version:**
In the R&S®DVM application, use **Help → Analyzer Info...** to open the **Site Configuration** dialog with the **Analyzer Info** tab. Click on the desired analyzer and the **Show Info** button.

2.5 Launching the R&S® DVM Analyzer Application and Creating a Basic Configuration

2.5.1 Launching the R&S® DVM Analyzer Application

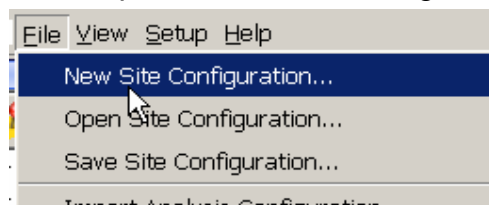


After power-up, the R&S® DVM application is launched automatically. If the application was terminated manually, it can be restarted any time by double-clicking the R&S® DVM program icon on the desktop.

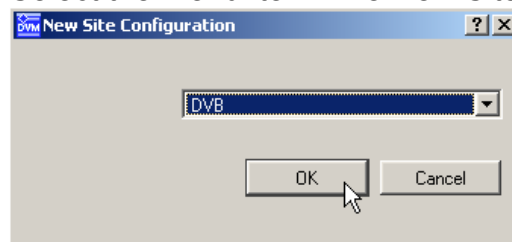
If you do not see the R&S® DVM program icon on the desktop, you can find the program under
Start → Programs → Rohde & Schwarz → DVM

2.5.2 Creating a Basic Configuration

After booting, the instrument automatically launches the R&S® DVM application. If the currently used system has never been configured before, perform a basic configuration as described below:



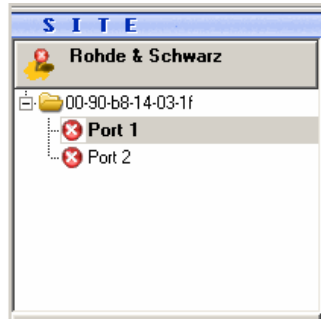
Select the menu item “File/New Site Configuration...”.



Select the desired TV standard in the dialog box and specify the memory location and a name for the configuration file.

Start the configuration with OK.

Figure 2.5-1 Site tree for an R&S® DVM100/DVM120 system with an analysis board having two inputs



After successful configuration, all installed TS inputs are displayed in the site tree. The system is now ready for operation. The configuration can be adapted as required with the aid of corresponding setup menus. Appropriate names can be assigned to the inputs in the site tree, the order of the inputs can be determined and inputs can be organized in folders.

2.5.3 The R&S® DVM Measurement Screen and its Operating Elements

Figure 2.5-2 The R&S® DVM measurement screen

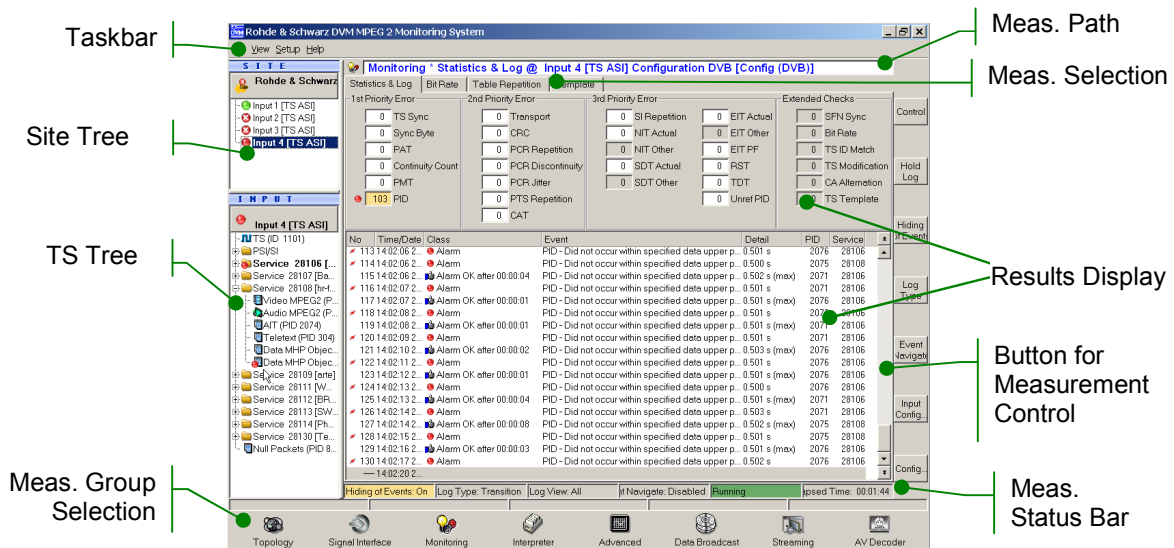












Table 2.5-1 Elements on the R&S® DVM measurement screen

Element	Description
Taskbar	Menus for control and configuration of complete system <ul style="list-style-type: none"> ◆ File – Loading and storing of instrument settings and measured values; printout of measurement results ◆ View – Selection of measurement group ◆ Setup – Setting of instrument parameters ◆ Help – User support
Site Tree	List of all signal inputs with current monitoring status. An input is selected by double-clicking the name. In addition to the site name, the header contains the total status of all signal inputs.
TS Tree	List of elements of transport stream present at the selected input. The header contains the total status of this transport stream in addition to the input name.
Measurement Group Selection	Button for direct selection of a measurement group.
Measurement Path	Display of selected measurement with measurement path.
Measurement Selection	Tabs for choosing a measurement from the selected measurement group.
Results Display	Result display for selected measurement.
Button for Measurement Control	Control of selected measurement.
Measurement Status Bar	Display of relevant settings and states of the selected measurement.

2.5.4 Indication of Signal and Error States

A key feature of the R&S® DVM is the indication of signal and error states of the applied transport streams. The signaled states are derived from the monitoring results. An update is therefore only performed for signal inputs for which monitoring is switched on. The table below gives an overview of signaling states.





Table 2.5-2 Symbols used to indicate alarm and error states

Symbol	Description	Status
	Green lamp/button	No alarm
	Red lamp/button with white cross	No transport stream found
	Red lamp/button	Alarm currently present
	Yellow lamp/button	Alarm occurred but is now gone
	Grey lamp/button	No analysis result. This lamp is always displayed together with another indication such as "monitoring stop" or "data link to analyzer interrupted".
	Red triangle	Warning currently present
	Yellow triangle	Warning occurred but is now gone
	Information icon (i on blue circle)	Information available (displayed only under Monitoring and in TS tree elements, not in higher-order folders of the TS tree and not in the site tree)
	Red connector	Data link to analyzer interrupted (always occurs together with a grey lamp)
	Red stop	Monitoring is stopped (always occurs together with a grey lamp)

Several elements of the site tree and the input tree can be organized in a folder. If status information is available for one or more elements, the information is displayed in the higher-order folder when the element folder is closed.

Examples are shown in the table below:






Table 2.5-3 Symbols for indicating alarm and error states in folders




Symbol	Description	Status
	Closed folder	No alarm, warning or info message is present for the contained elements.
	Closed folder with red lamp + yellow triangle + red stop	The following applies to one or more signal inputs of this folder: <ul style="list-style-type: none"> ◆ An alarm signal is present ◆ A warning has occurred ◆ The measurement has been stopped
	Closed folder with yellow lamp + red connector	The following applies to one or more signal inputs of this folder: <ul style="list-style-type: none"> ◆ An alarm occurred data link to any analyzer interrupt 1 ◆ The measurement has been stopped
	Closed folder with grey lamp + red connector	The following applies to all signal inputs of this folder: <ul style="list-style-type: none"> ◆ No analysis result ◆ Data link to analyzer interrupted

2.5.5 The R&S® DVM Measurement Groups

The following R&S® DVM measurement groups can be directly selected via icons on the screen.

Table 2.5-4 Overview of the R&S® DVM measurement groups

Symbol	Measurement Group	Property
	Topology	Combined signaling of monitoring status for all configured signal inputs on a background display. Every input is represented by a separate icon. The position of the icons can be configured. The background display can be customized and loaded.
	Signal Interface	Measurement of the physical characteristics of the input signal. The type of measurement depends on the interface used.
	Monitoring	<p>Display of monitoring status of a selected input with the following views:</p> <ul style="list-style-type: none"> ◆ Statistics & Log – number and type of faults indicated as a sum and listed in chronological sequence in a report ◆ Data Rate – graphical display of data rate of individual transport stream elements ◆ Table Repetition – graphical display of repetition rate of SI/PSI/PSIP tables ◆ Template Monitoring (TS Template Monitoring option) – display of the template used as tree with marks that indicate the deviations detected. <p>Every configured input is separately monitored. The results are displayed in the form of a sum message in the site tree and under Topology.</p>
	Interpreter (Option In-depth Analysis)	<p>Display and interpretation of selectable data in the transport stream with the following options:</p> <ul style="list-style-type: none"> ◆ Packet Interpreter – display of individual transport stream packets ◆ Table/PES Interpreter – display of selectable SI/PSI/PSIP tables or PES headers ◆ Header Map – list of transport stream headers in chronological sequence ◆ TS List – table of all transport stream elements with key specifications
	Advanced (Option In-depth Analysis)	<p>In-depth measurements for timing specifications of transport stream</p> <ul style="list-style-type: none"> ◆ PCR Jitter Analysis - analysis with recording of PCR repetition times ◆ PTS Analysis – analysis of PCR/PTS shift and PTS intervals

Symbol	Measurement Group	Property
	Data Broadcast (Option DVB Data Broadcast Analysis)	Data Broadcast Analysis <ul style="list-style-type: none"> ◆ Overview - Displays all descriptors that refer to the selected data service in the created transport stream. ◆ Interpreter - Displays the contents of an element in the protocol tree. The display depends on the service and on the type of element selected. ◆ Raw Data - Displays the raw data of the element selected ◆ Timing – Data and Object Carousel Timing analysis
	Streaming	Start of applications for processing individual elements. <ul style="list-style-type: none"> ◆ Video Player (media player – video live picture decoding. ◆ Elementary Stream Analyzer – video elementary stream analysis with the optional R&S® DV-ESA software. ◆ DVB-H Time Slice Analyzer – unpacking and processing of DVB-H content with the Data Broadcast Analysis R&S®DVM-K11 option. ◆ Write to file – function for storing individual TS elements on hard disk.
	AV Decoder (Option Video and Audio Hardware Decoder)	Control of the integrated Video and Audio Hardware Decoder <ul style="list-style-type: none"> ◆ TV – information about decoded video and audio signal. Display of the video signal on the integrated display (DVM400 only) ◆ Decoder Status Info – status information about the hardware decoder

