



## Quick Start Guide

# R&S<sup>®</sup> DVM400/R&S<sup>®</sup> DVM120 DIGITAL VIDEO MEASUREMENT SYSTEM

The Quick Start Guide the following models and options of the  
DIGITAL VIDEO MEASUREMENT:

- ◆ R&S® DVM400 2085.1800.03
- ◆ R&S® DVM120 2085.1700.03

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**ROHDE & SCHWARZ**  
EC Certificate of Conformity



Certificate No.: 2007-07

This is to certify that:

Equipment type	Stock No.	Designation
DVM400	2085.1800.03	Digital Video Measurement System
DVM-B50	2085.5605.02	Demodulator Module
DVM-B51	2085.5611.02	DVB-S / DVB-S2 Receiver Module
DVM-B52	2085.5628.02	DVB-T / DVB-H Receiver Module
DVM400-B1	2085.5505.02	Analyzer
DVM400-B2	2085.5511.02	TS Generator
DVM400-B3	2085.5528.03	Upgrade TS Recorder 90MBit/s
DVM400-B4	2085.5534.03	Upgrade TS Recorder 214MBit/s
DVM400-B30	2085.5540.02	HD/SD Decoder
DVM400-B40	2085.5557.02	Gigabit Ethernet Interface Module
DVM400B500	2085.5563.02	RF Carrier Board and Decoder Extension

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 : 2001-12  
EN 61326 : 1997 + A1 : 1998 + A2 : 2001 + A3 : 2003  
EN 55011 : 1998 + A1 : 1999 + A2 : 2002, Class A  
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 A 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, 2007-08-22

Central Quality Management MF-QZ / Radde



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.

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Munich, 2007-08-23

Central Quality Management MF-QZ / Radde

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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.

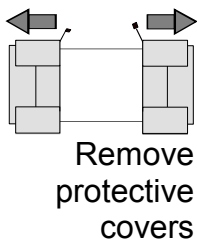
## 1.1 Notes on Putting into Operation

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.

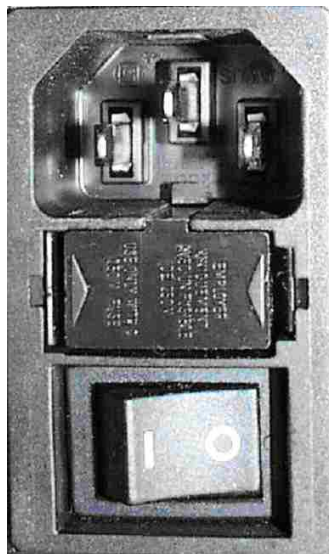
## 1.1.4 EMC Safety Precautions

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.

## 1.1.5 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® DVM400



R&S® DVM120

## 1.1.6 Installation in a 19" Rack

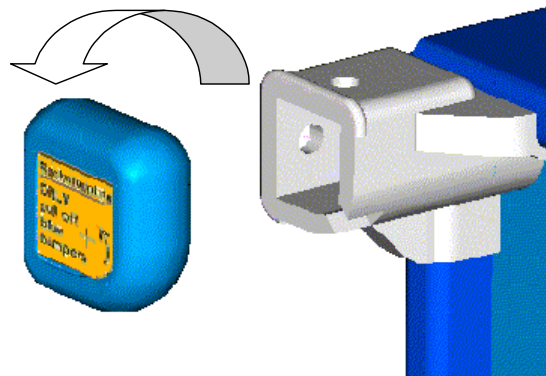
**Important:**

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.

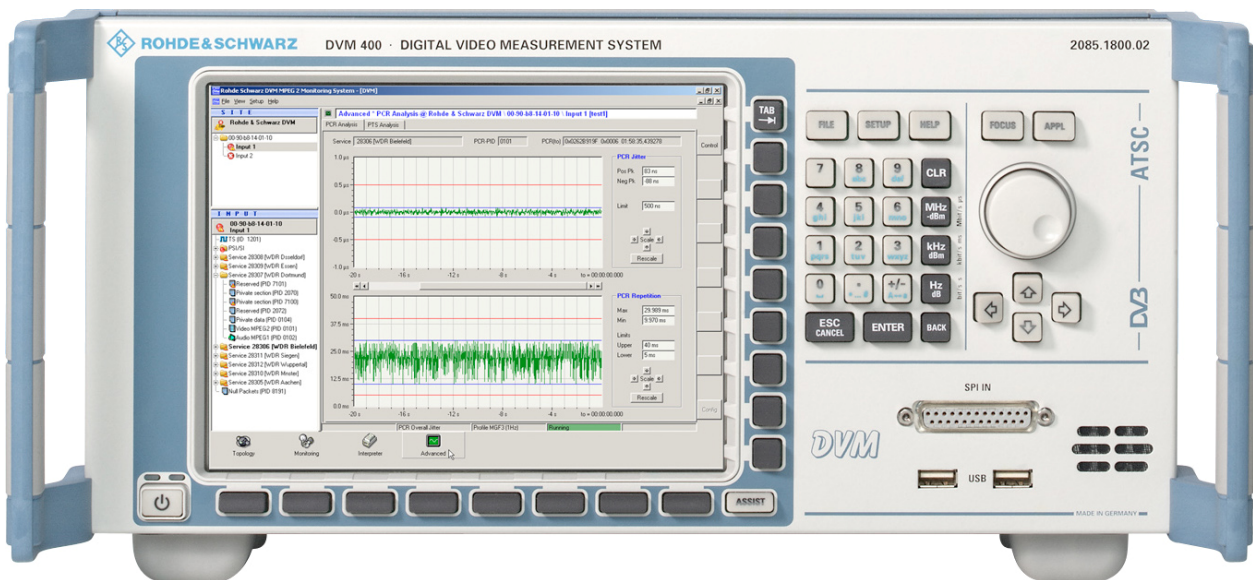
## 2 Introduction to the R&S® DVM Basic System

This chapter introduces the operating concept and describes front and rear panels of the instrument with relevant control elements and connectors.

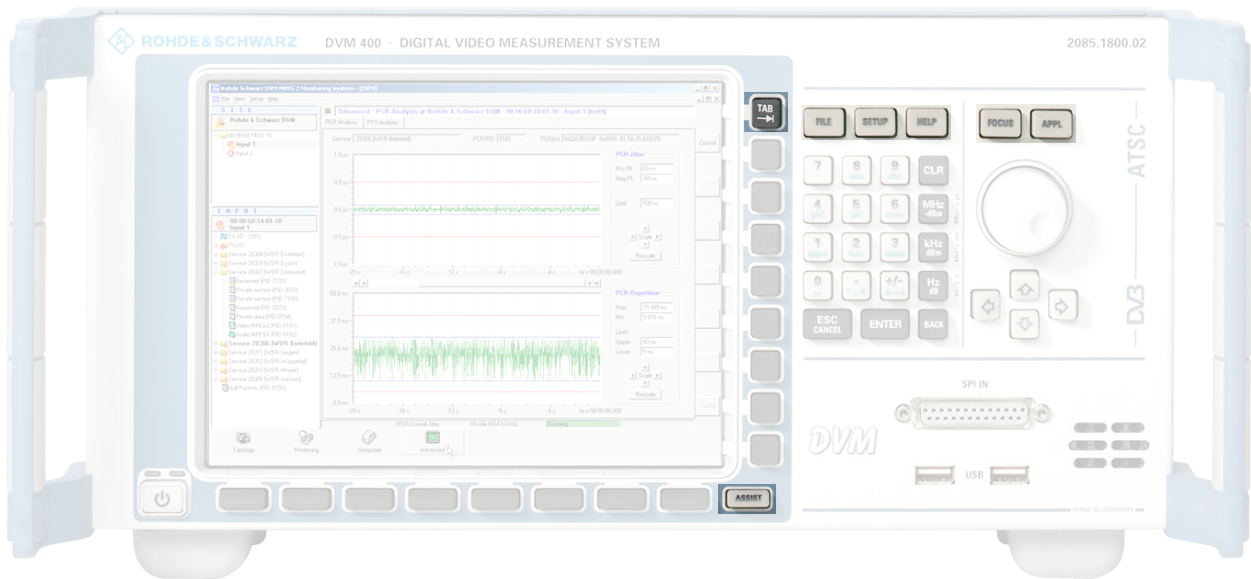
### 2.1 Legend for Front and Rear View

#### 2.1.1 Front Panel of the R&S® DVM400

Figure 2-1 Front Panel of the R&S® DVM400



Power-on button with standby LED (yellow) and operating LED (green)



**Softkeys**

The function of the softkeys is dependent on the application.



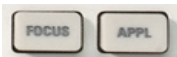
Selects the tabs in order in the measurement or configuration window of the DVM application.



Context-menu button opens a context-sensitive submenu for the selected element (if available).



The menu buttons open the respective menu for the (ALT-F, ALT-S, ALT-H) application.



**FOCUS button**

Switches the active focus between the input fields of the R&S® DVM application.

**APPL button**

Switches all open applications to the foreground in sequence.



The keypad is used to enter numerical values, the decimal point and minus sign.

**0...9**

Inputs a digit.

•

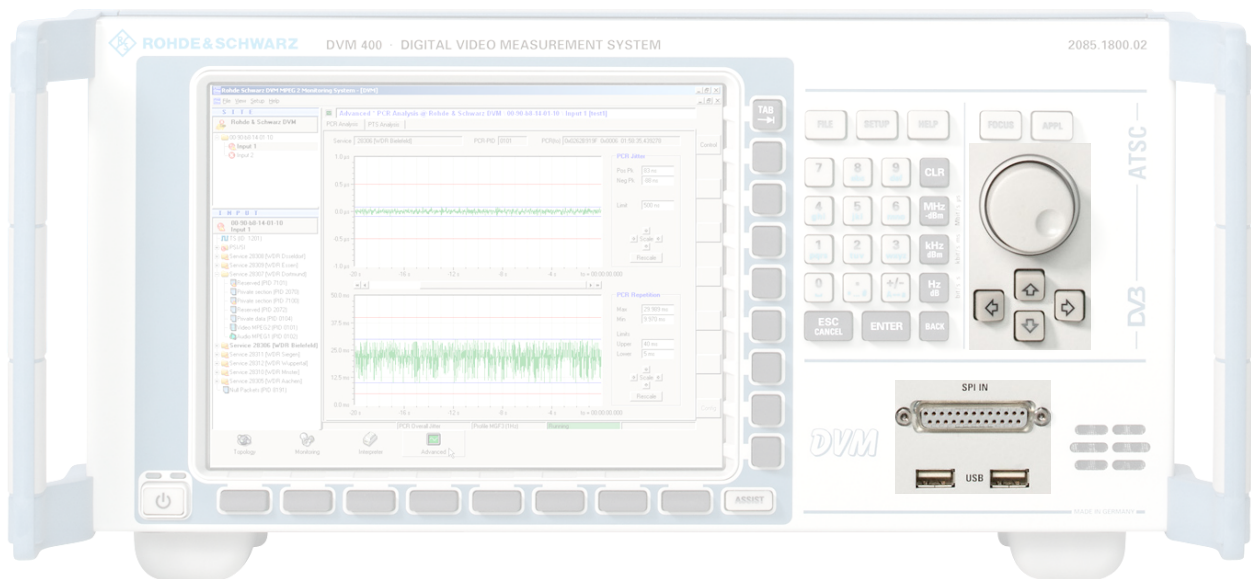
Inputs a decimal point.

+/-

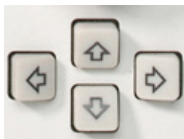
Inputs a minus sign.

**BACK**

Clears the sign to the left of the input marker.



The rotary control moves the menu cursor through the available parameters of a menu level, or it varies the value of a parameter. You can also push the rotary control at a selected position in the menu to update the respective setting [SPACE].



**LEFTARROW** and **RIGHTARROW** key

**UPARROW** and **DNARROW** key

The **UPARROW** or **DNARROW** keys do the following:

- ◆ In a numeric edit dialog box, increase or decrease the instrument parameter.
- ◆ In a list, scroll forward and backward through the list entries.
- ◆ In a table, move the selection bar vertically.
- ◆ In windows or dialog boxes with vertical scroll bar, move the scroll bar.



**Parallel transport stream input**

For the pin assignment, see Section A.4 of the appendix.



**USB interface**

For the pin assignment, see Section A.5 of the appendix.

For R&S® DVM400 version 02 USB 1.0

For R&S® DVM400 version 03 USB 2.0

## 2.1.2 Rear Panel of the R&S® DVM400

Figure 2-2 Rear panel of the R&S® DVM 400



### Controller interfaces



#### LAN 100 BASE-T

RJ-45 female connector for remote control of the entire system via the network  
 Note: 1000BT for R&S®DVM400 Version 03

#### LOCAL 100 BASE-T

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



#### Caution:

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 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.





### ANALYZER 100 BASE-T

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



### USB interface

For R&S® DVM400 version 02  
USB 1.0

For R&S® DVM400 version 03  
Top USB 1.0; Bottom USB 2.0

For the pin assignment, see Section A.5 of the appendix.



### VGA MONITOR

15-contact female connector for a PC monitor.  
For the pin assignment, see Section A.2 of the appendix.



### ALARM LINES

15-contact female connector  
12 relay outputs that can be assigned to one or more (ORed) events.  
For the pin assignment, see Section A.1 of the appendix.



### 10 MHz reference input



### Parallel transport stream output

For the pin assignment, see Section A.3 of the appendix.



#### **4-CHANNEL AES3 (option DVM400-B30)**

15-contact female connector

Up to four separate AES3 digital audio output channels  
For the pin assignment, see Section A of the appendix.

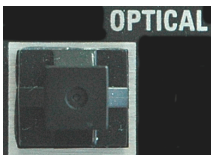


#### **L / R (option DVM400-B30)**

3.5 mm stereo headphones connector (female)

Stereo output for analog audio

For the pin assignment, see Section A of the appendix.



#### **OPTICAL (option DVM400-B30)**

TOSLINK female connector

Output for digital audio (stereo)

For details, see Section A of the appendix.



#### **CCVS OUT (option DVM400-B30)**

BNC female connector

Analog video output (composite)

For details, see Section A of the appendix.

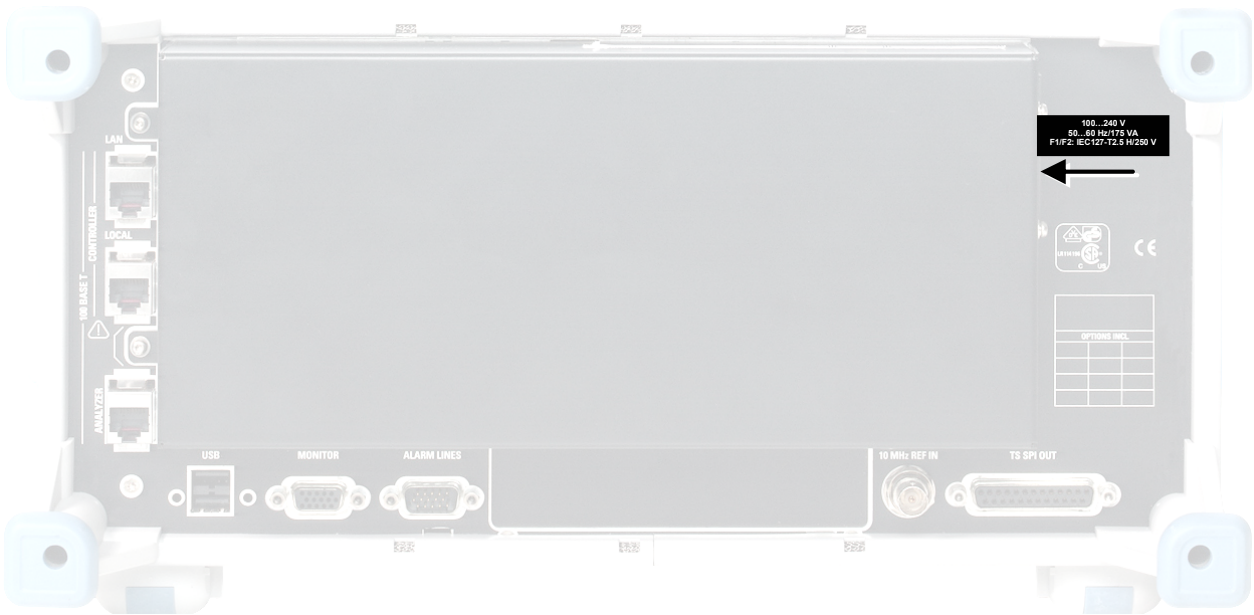


#### **HDMI / DVI-I OUT (option DVM400-B30)**

DVI-I female connector

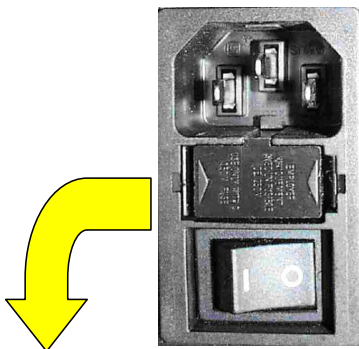
Digital and analog video output (components)

For details, see Section A of the appendix.



**100...240 V  
50...60 Hz/175 VA  
F1/F2: IEC127-T2.5 H/250 V**

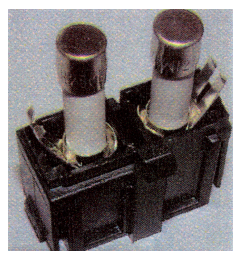
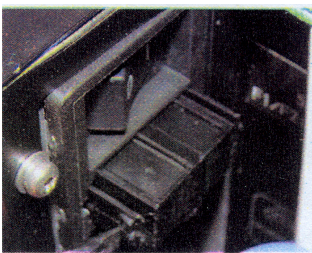
(see *Equipment inscription*) Automatic voltage switching.



**AC connector**

**Fuses**

**Power switch**

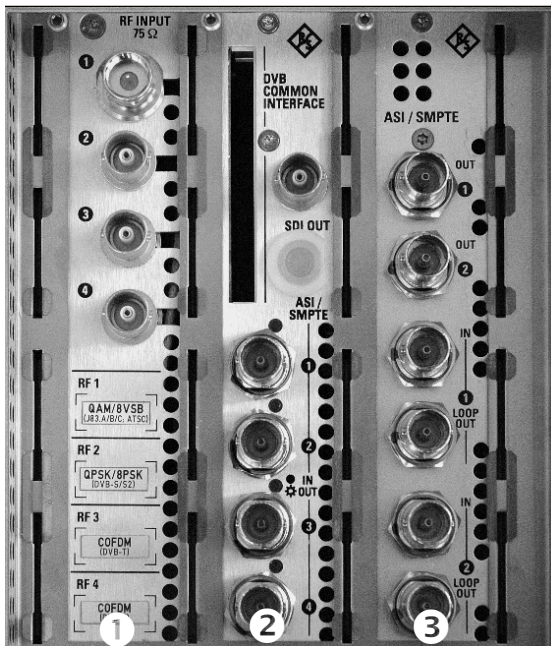


To change the fuses, pull out the power plug and open the fuse cover from the side.

Remove a defective fuse from the fuseholder and replace it.

The signal connectors are located on the left side of the instrument. Depending on the instrument configuration, different connectors are provided. The figures below show two typical configurations of the R&S® DVM400.

**Figure 2-3** Side view of the R&S® DVM400



#### Example 1

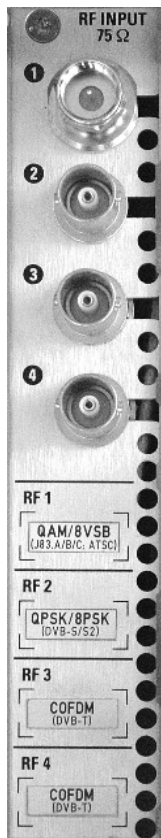
- (1) RF Receiver  
Option R&S® DVM400-B50/B51/B52
- (2) TS Analyzer  
Option R&S® DVM400-B1
- (3) TS Player and recorder  
Option R&S® DVM400-B2



#### Example 2

- (1) RF Receiver  
Option R&S® DVM400-B51/B51/B52
- (2) TS Analyzer  
Option R&S® DVM400-B1
- (3) IP Interface  
Option R&S® DVM400-B40

**Figure 2-4 Interfaces of the R&S® DVM400-B500 RF interface option with the B50, B51, and B52 options**



### RF Inputs 1 to 4

1. Signal input QPSK/8PSK (DVB-S/S2)  
Option DVM400® B51  
F-Connector, male, 75 Ω
2. Signal input QAM (J.83/A/B/C; DVB-C) and ATSC  
Option DVM400® B50 with DVM400® K501/502/503  
BNC connector, female, 75 Ω
3. First Signal input COFDM (DVB-T)  
Option DVM400® B52  
BNC connector, female, 75 Ω
4. Second Signal input COFDM (DVB-T)  
Option DVM400® B52  
BNC connector, female, 75 Ω

Depending on the instrument configuration, the type and number of RF inputs may differ from the RF inputs shown on the left.

Figure 2-5 Interfaces of the R&amp;S® DVM400-B1 TS analyzer option

**DVB COMMON INTERFACE**

Ready for future applications

**SDI OUT**

HDSDI/SDI output for DVM400® B30 hardware decoder option with DVM400® K30 expansion, BNC connector, female

**ASI/SMPTE 1 to 4**

1. TS ASI /SMPTE 310M input / loop-through output
2. TS ASI /SMPTE 310M input / loop-through output
3. TS ASI /SMPTE 310M input / loop-through output
4. TS ASI /SMPTE 310M input / loop-through output

**Note:**

The above TS interface assignment applies to instruments that contain RF modules. In the case of older instruments, which contain no RF modules, the interface assignment may be as follows:

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. (4)TS input 4 or alternatively  
TS output (TS from input 3 actively looped through – LED OUT)

**ASI / SMPTE 310 Interfaces specification**

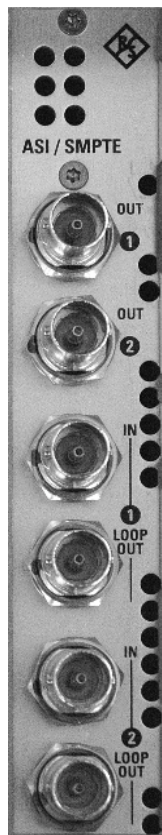
BNC connectors, female

ASI (ASYNCHRONOUS SERIAL INTERFACE) in line with EN50083-9 and SMPTE-310M (synchronous serial) (19.392658 Mbit/s).

The use of the inputs depends on the option (see data sheet).

TS interfaces that are configured as an output are indicated by an illuminated yellow LED during operation.

Figure 2-6 Interfaces of the R&amp;S® DVM400-B2 TS recorder/generator option

**ASI/SMPTE OUT**

OUT 1 and 2      TS ASI/SMPTE 310M output

**ASI/SMPTE IN and LOOP OUT**

IN 1              TS ASI/SMPTE 310M input 1 for recording

LOOP OUT 1      TS ASI/SMPTE 310M active loop-through from IN 1

IN 2              TS ASI/SMPTE 310M input 2 for recording

LOOP OUT 2      TS ASI/SMPTE 310M active loop-through from IN 2

**ASI / SMPTE 310 Interface specification**

BNC connectors, female

ASI (ASYNCHRONOUS SERIAL INTERFACE) in line with EN50083-9 and SMPTE-310M (synchronous serial) (19.392658 Mbit/s).

The use of the inputs depends on the option (see data sheet).

**Note:**

The functions of the R&S® DVM400-B2 TS recorder/generator option are described in a separate manual.

**Figure 2-7 Interfaces of the R&S® DVM400-B40 Gigabit Ethernet interface option****1000BT**

Gigabit Ethernet interface

RJ45 connector, protocol in line with IEE 802.3

**TS ASI IN/OUT**

1. TS ASI output for primary IP to TS transcoding
2. TS ASI input/output for TS to IP and secondary IP to ASI transcoding.
3. TS ASI input/output for TS to IP and secondary IP to ASI transcoding.

**TS ASI Interface specification**

BNC connectors, female

ASI (ASYNCHRONOUS SERIAL INTERFACE) in line with EN50083-9.

**Note:**

The TS ASI output (1) must be connected via a 75  $\Omega$  coaxial cable to that TS ASI input of the TS analyzer that is configured for "TS ASI via IP" analysis.



## 2.1.3 Front Panel of the R&S® DVM120

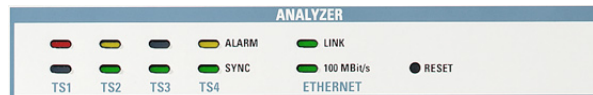
Figure 2-8 Front Panel of the R&S® DVM120



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.





## 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**

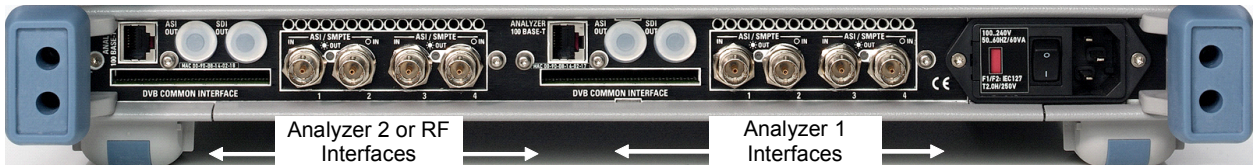
- green max. data rate 100 Mbit/s
- off max. data rate 10 Mbit/s

## 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.

## 2.1.4 Rear Panel of the R&S® DVM120

Figure 2-9 Rear Panel of the R&S® DVM120



### Analyzer 1 and 2 Interfaces



#### TS ASI / SMPTE 310M

1. TS input / loop-through output
2. TS input / loop-through output
3. TS input / loop-through output
4. TS input / loop-through output

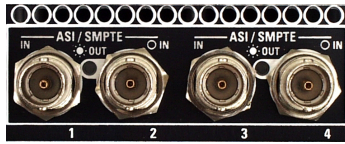
#### TS ASI / SMPTE 310 Interface specification

BNC connectors, female ASI (ASYNCHRONOUS SERIAL INTERFACE) in line with EN50083-9 and SMPTE-310M (synchronous serial) (19.392658 Mbit/s).

The use of the inputs depends on the option (see data sheet).

**Note:**

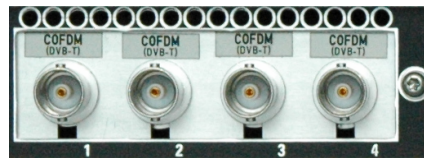
The above TS interface assignment applies to instruments that contain RF modules. In the case of instruments that contain no RF modules, the interface assignment may be as follows:



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)

**RF signal interfaces 1 to 4**

In the case of instruments that have an RF interface, the RF inputs replace the analyzer 2 TS interfaces.



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

**DVM-B30 Decoder Audio and Video outputs**

For instruments equipped with a hardware decoder DVM-B30, the signal outputs for analog audio and analog/digital video CCVS/SDI are located as shown.



- ◆ Audio headphone female connector **L/R OUT**
- ◆ Video CCVS or SDI female BNC connector **CCVS SDI OUT**

◆ **100 BASE-T**



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



Optional – for future extensions

## 2.2 Setting Up and Configuring a New R&S® DVM Analysis System

The base component of an R&S® DVM Analysis System is the R&S® DVM400. 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® DVM400. Expanded systems – containing several analyzers - are connected via an Ethernet hub.

The basic functions can be accessed using the keypad on the front panel. For faster access to the controls, we recommend using the mouse supplied with the instrument.

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.

**Caution:**

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.

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## 2.2.1 System with the R&S® DVM400

If a system contains only one R&S® DVM400, the analyzer can be directly connected to the controller. A crossed Ethernet cable such as the one supplied with the R&S® DVM400 must be used in this case.

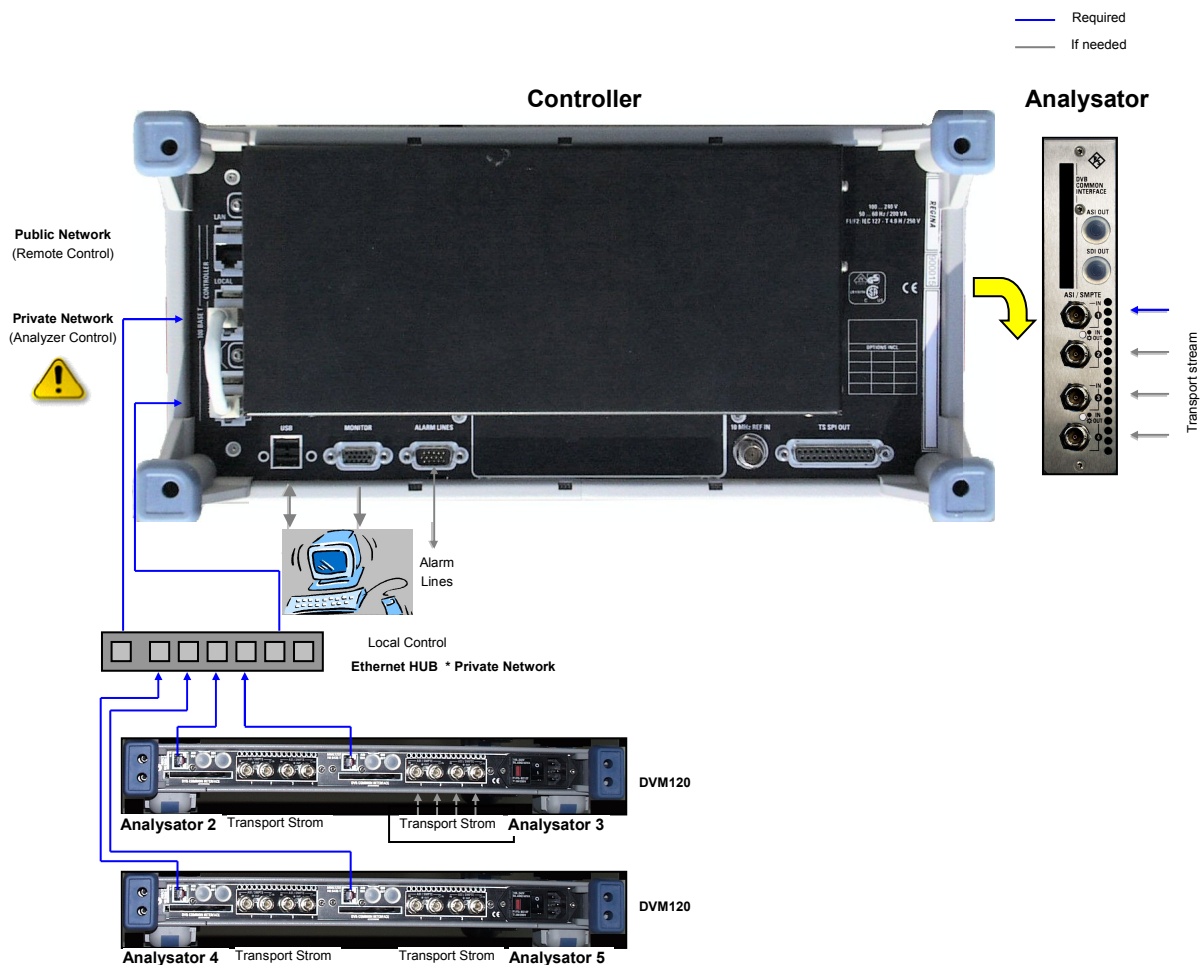
Figure 2-10 Connections of basic configuration of the R&S® DVM 400



## 2.2.2 System with the R&S® DVM400 and R&S® DVM120

In a system containing both the R&S® DVM400 and 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 2-11 Connections of basic configuration of the R&S® DVM400 + R&S® DVM120





## 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.

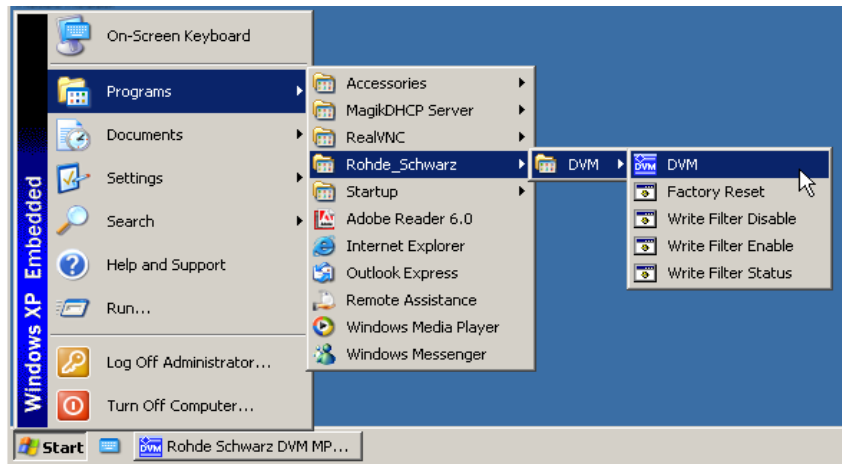
### 2.4.2 XP Embedded Operating System

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



<b>Write Filter Disable</b>	Disable the write filter
<b>Write Filter Enable</b>	Enable the write filter
<b>Write Filter Status</b>	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.

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### 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>... . # # <b>server 120.34.56.78 prefer</b> 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

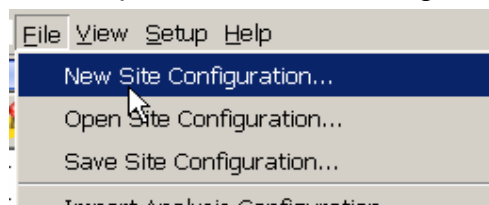


After power-up, the R&S® DVM application is launched automatically. If the application was terminated manually, it can be restarted any time by double-clicking the R&S® DVM program icon on the desktop.

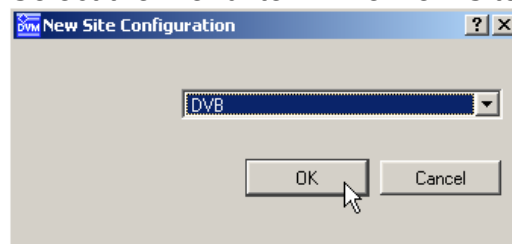
If you do not see the R&S® DVM program icon on the desktop, you can find the program under  
Start → Programs → Rohde & Schwarz → DVM

### 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:



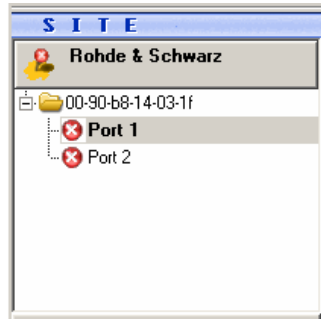
Select the menu item “File/New Site Configuration...”.



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

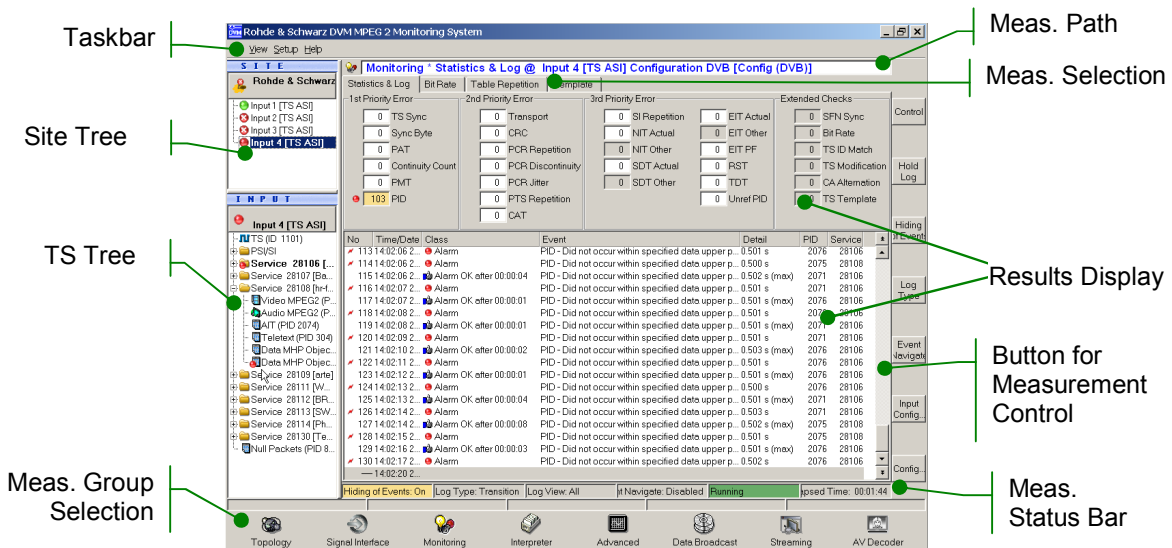












Table 2.5-1 Elements on the R&amp;S® DVM measurement screen

Element	Description
<b>Taskbar</b>	Menus for control and configuration of complete system <ul style="list-style-type: none"> <li>◆ File – Loading and storing of instrument settings and measured values; printout of measurement results</li> <li>◆ View – Selection of measurement group</li> <li>◆ Setup – Setting of instrument parameters</li> <li>◆ Help – User support</li> </ul>
<b>Site Tree</b>	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.
<b>TS Tree</b>	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.
<b>Measurement Group Selection</b>	Button for direct selection of a measurement group.
<b>Measurement Path</b>	Display of selected measurement with measurement path.
<b>Measurement Selection</b>	Tabs for choosing a measurement from the selected measurement group.
<b>Results Display</b>	Result display for selected measurement.
<b>Button for Measurement Control</b>	Control of selected measurement.
<b>Measurement Status Bar</b>	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
	Info 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"> <li>◆ An alarm signal is present</li> <li>◆ A warning has occurred</li> <li>◆ The measurement has been stopped</li> </ul>
	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"> <li>◆ An alarm occurred data link to any analyzer interrupt 1</li> <li>◆ The measurement has been stopped</li> </ul>
	Closed folder with grey lamp + red connector	The following applies to all signal inputs of this folder: <ul style="list-style-type: none"> <li>◆ No analysis result</li> <li>◆ Data link to analyzer interrupted</li> </ul>

## 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"> <li>◆ Statistics &amp; Log – number and type of faults indicated as a sum and listed in chronological sequence in a report</li> <li>◆ Data Rate – graphical display of data rate of individual transport stream elements</li> <li>◆ Table Repetition – graphical display of repetition rate of SI/PSI/PSIP tables</li> <li>◆ Template Monitoring (TS Template Monitoring option) – display of the template used as tree with marks that indicate the deviations detected.</li> </ul> <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"> <li>◆ Packet Interpreter – display of individual transport stream packets</li> <li>◆ Table/PES Interpreter – display of selectable SI/PSI/PSIP tables or PES headers</li> <li>◆ Header Map – list of transport stream headers in chronological sequence</li> <li>◆ TS List – table of all transport stream elements with key specifications</li> </ul>
	Advanced (Option In-depth Analysis)	<p>In-depth measurements for timing specifications of transport stream</p> <ul style="list-style-type: none"> <li>◆ PCR Jitter Analysis - analysis with recording of PCR repetition times</li> <li>◆ PTS Analysis – analysis of PCR/PTS shift and PTS intervals</li> </ul>

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

