Version 01.00

April 2007

R&S®DVM Family

The best solution for all DTV monitoring and development applications

- Comprehensive monitoring functions
- Detailed configuration options
- Powerful network functions
- Extensive analysis and visualization functions
- Detailed elementary stream analysis
- Detailed data service analysis
- Video and audio decoding
- Recording and generation of transport streams
- Various interfaces for RF signals
- Gigabit Ethernet IP interface
- Support of the following standards:
  - SDTV
  - HDTV
  - MPEG-2
  - H.264
  - AAC
  - Dolby AC-3

ROHDE&SCHWARZ

Overview

All-in-one solutions from a single source

We've got the answer for anyone whose work involves MPEG-2 or DTV components:

- Network operators
- Program providers
- Designers of MPEG-2 or DTV components
- Other jobs in the DTV field

Our R&S®DVM family of instruments provides you with all-in-one solutions for all monitoring, analysis, and development tasks in the field of digital TV. All four base units can be configured in accordance with customer requirements and expanded whenever necessary.

R&S®DVM50 – the starter package

- Particularly cost-efficient solution for all monitoring and analysis tasks, whether in the lab, in service, or unattended in the field
- Monitoring/analysis of transport streams and contents
- Monitoring, analysis, and demodulation of RF signals of various standards
- Operation via external PC

R&S®DVM100/R&S®DVM100L – space-saving

- Ideal for network operators and program providers
- Monitoring/analysis of transport streams and contents
- Monitoring, analysis, and demodulation[1)] of RF signals of various standards
- Monitoring of up to 20 signals in one system when expanded with the R&S®DVM120

R&S®DVM400 – universal and portable

- Broadest scope of functions – ideal for development
- Monitoring/analysis of transport streams and contents
- Monitoring, analysis, and demodulation of RF signals of various standards
- Monitoring, analysis, and transcoding of IPTV signals (Gigabit Ethernet)
- Powerful generator and recorder options with extensive TS libraries and TS multiplexer software
- Parallel operation of several functions
- Small and low in weight, making it ideal for portable use

R&S®DVM120 – a complementary choice

- Expansion to the R&S®DVM100, R&S®DVM100L, and R&S®DVM400 for simultaneous monitoring of more than four signals in one system
- Integration into the user interface of the base unit

R&S®DVM50

R&S®DVM100

R&S®DVM400

R&S®DVM120

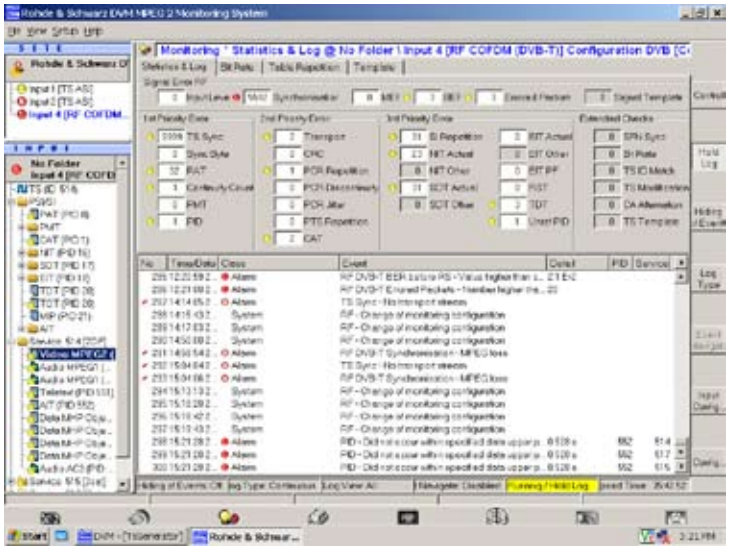
[1)] Only R&S®DVM100L.

Features

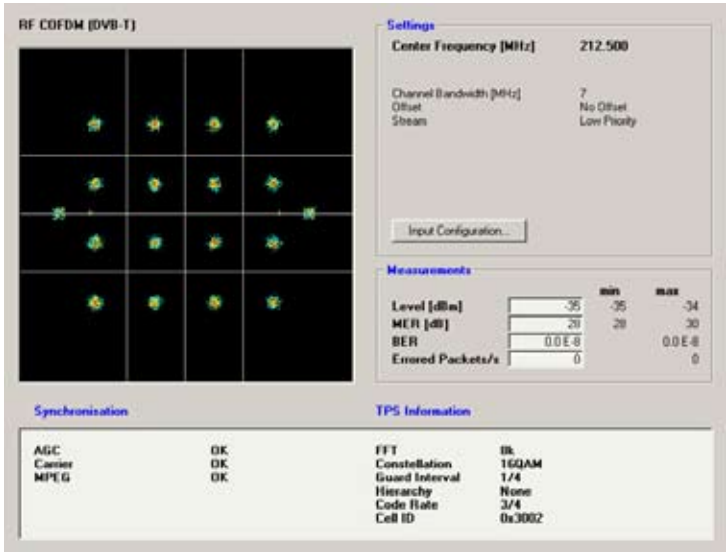
Comprehensive monitoring functions

- RF signals of various standards
  All relevant signal characteristics are monitored. This includes level, frequency deviation, BER, MER, C/N, SNR, and E_b/N_0[1]. The measurement results can be easily illustrated with the constellation diagram.
- IPTV signals
  Up to 300 IP signals on the Gigabit Ethernet link are monitored simultaneously. Extensive measurements permit a safe assessment of the signal quality. The measurements include MDI-DF (delay factor), MDI-MLR (media loss rate), IP bit rate, IP packet jitter, IP inter-arrival time, and payload bit rate.
- Transport stream characteristics not only in line with TR 101 290
  For monitoring transport streams not only the characteristics specified in the TR 101 290 Measurement Guidelines with priority levels 1, 2, and 3 are analyzed, but many others as well. This includes the MIP that is used in DVB-T SFN, the data rates of the individual elements, and compliance with encryption requirements. Moreover, the TS Modification measurements make it possible to determine whether there have been modifications to the transport stream. These modifications may not be detected by the measurements in line with TR 101 290 although they are perhaps undesired or should be recognized. An example of an undetected modification is the omission of sound. This is not detected in line with TR 101 290 if the multiplexer modifies the PMT accordingly.
- Template monitoring
  Template monitoring allows the comparison of numerous transport stream characteristics with predefined values. Additional important characteristics can thus be monitored, such as the following:

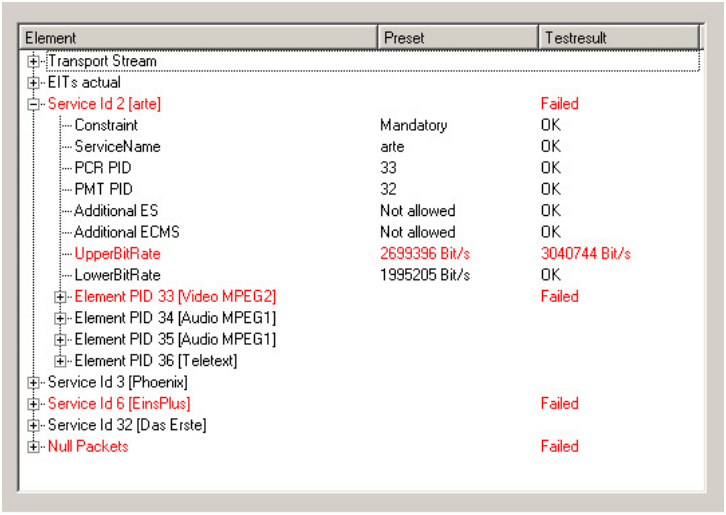
[1] Measurements depend on standard.



Graphical user interface of the R&S®DVM: overview of monitored signals and contents of a selected signal (left) as well as report entries and error counter (right)



Constellation diagram and measurement results for a DVB-T signal



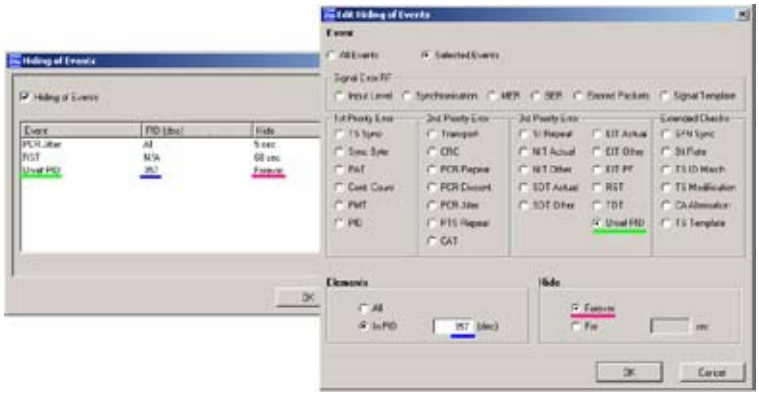
Template monitoring function with unique and easy-to-read display of measurement results

– Are all programs are available?
– Do the programs include all desired elements?
– Does a program occupy to much bandwidth?
– Are all program designations correct?

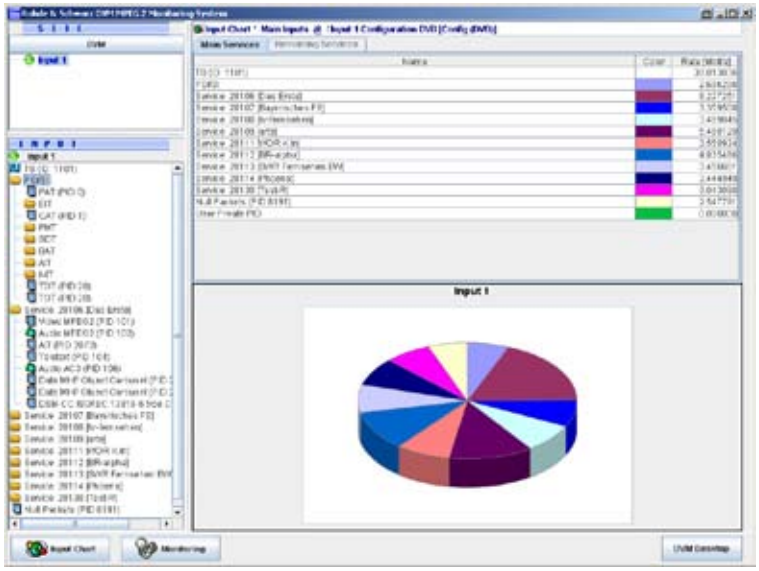
A special feature of the function is the automated template generation by means of the applied transport stream. The template is generated by simply pressing a button.

- TS Capture
  The TS Capture function allows event-controlled archiving of TS segments on the system hard disk for later analysis and for verification or documentation purposes. Automated recording of incorrect TS segments is thus possible. This function is simultaneously available for all monitored transport streams (up to 20). The TS Capture function can be adapted to user requirements by means of various settings such as PID filter, pre-trigger size, start event, etc

TS Capture: configuration window



Hiding of Events: configuration window and list of generated entries



Web server: view of level 1

Detailed configuration options

The decisive factor for efficient monitoring is that users can configure the monitoring functions to match their tasks and adapt them to the signal. The basic settings include the threshold definition, the classification of the measurement with respect to its importance, and the customized activation of the individual measurements. Moreover, the instruments of the R&S®DVM family offer the following configuration choices:

- Scan mode
  For one input, different channels with different configurations can be defined for monitoring. The time-controlled switchover between the channels makes it possible to sequentially check a number of channels with one physical input.

- Hiding of Events
  This function allows continuous or time-limited suppression of error messages related to specific measurements and TS elements.

Powerful network functions

- Web server
  The instruments of the R&S®DVM family provide a web server, making it possible to conveniently check the measurement results (level 1), perform analyses (level 2), and also change configurations (level 3) from a remote location. The web server can be called up with any conventional browser from any PC in the network.
- SNMP
  The instruments of the R&S®DVM family feature an SNMP interface, allowing their easy integration into network management systems. All results of the monitoring functions can be queried. In addition, it is possible to configure all monitoring functions. All errors detected by the instrument are signaled via SNMP traps.

Extensive analysis and visualization functions

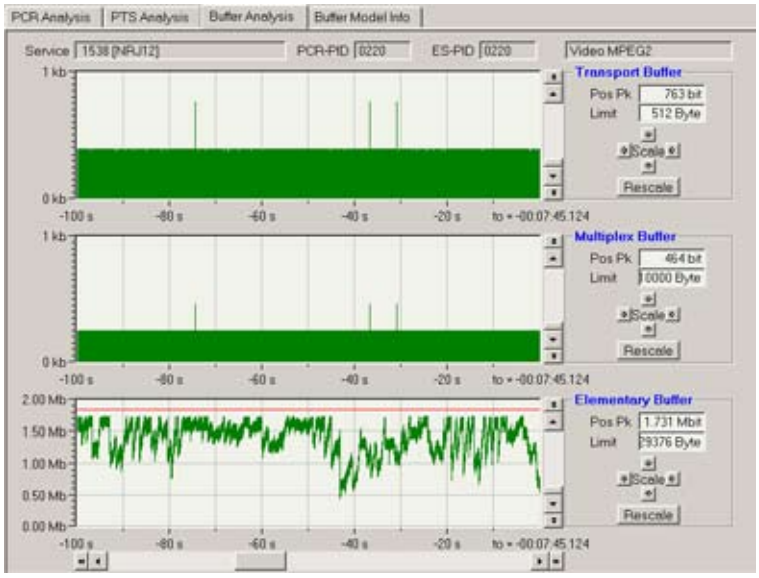
The following functions are available at the transport stream level for visualizing measurement results and for performing detailed analysis:

- Data rates
- Table repetition rates
- Packet and table interpreters
- PCR analysis
- PTS analysis
- Buffer analysis

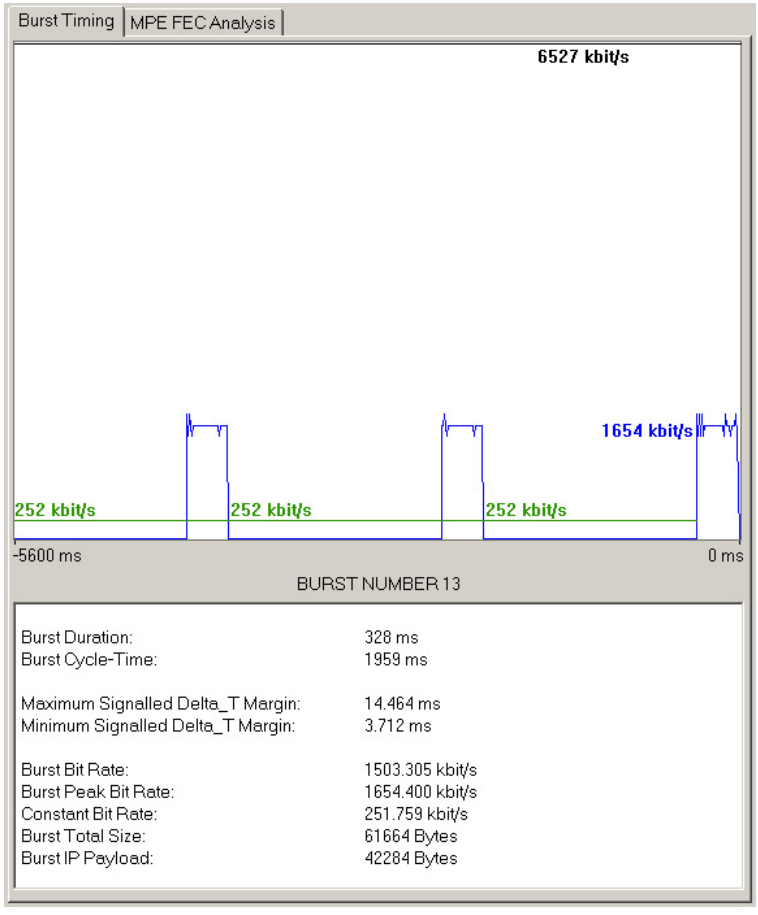
Detailed elementary stream analysis

The video and audio elementary streams are analyzed by means of separate software tools that can be conveniently started via the main view of the R&S®DVM GUI:

- Video elementary stream with MPEG-2 or H.264 coding
- Audio elementary stream with MPEG-1/2, AAC, or Dolby AC-3 coding



Buffer analysis: display of individual buffers versus time



Analysis of time-slicing in the case of DVB-H

Detailed data service analysis

The instruments of the R&S®DVM family also support the analysis of a variety of data services. Teletext, VPS, SSU, and MHP services, for example, can be analyzed in detail. In the case of DVB-H, time slicing is visualized and an extensive analysis of the error protection (MPE-FEC) is performed.

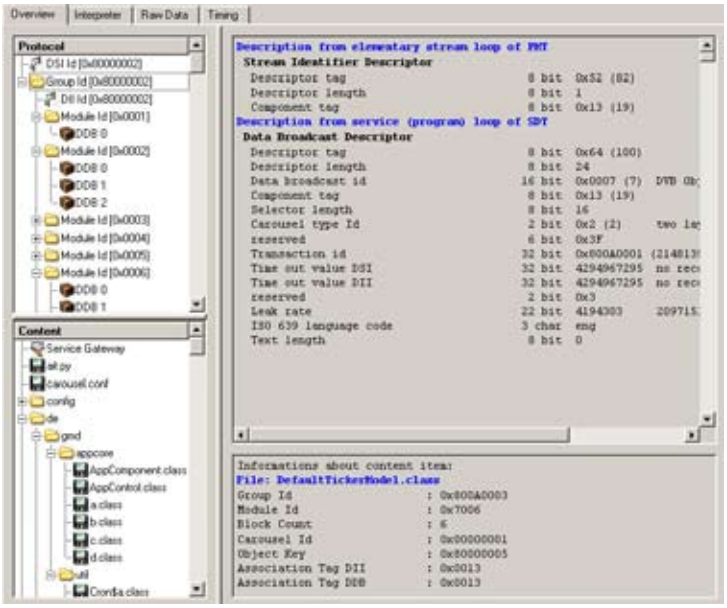
Video and audio decoding

The hardware decodes the video and audio signals contained in the transport stream, allowing users to quickly identify the programs and to immediately view and assess the picture quality. The decoder is internally connected to the TS analyzer board. It is thus possible to decode any program of any transport stream fed to the TS analyzer board. The transport stream can either be externally applied (BNC connectors) or can be supplied by the internal RF demodulators.

The decoder supports the SDTV and HDTV formats. Various display types for video display can be connected via numerous interfaces, including the DVI/HDMI interface. The R&S®DVM400 digital video measurement system already includes a screen for displaying the graphical user interface. The decoded picture can be directly shown on the integrated display. With the decoder, all models of the R&S®DVM family additionally feature an on-screen display (OSD) function that provides an informative and quick overview of the technical characteristics of the signal. The video and audio signals of a program are decoded at the same time. The decoder supports MPEG-2 and H.264 for video signals and all common formats for audio signals from MPEG-1 Layer II to Dolby Digital.

Recording and generation of transport streams

When equipped with a hardware option, the R&S®DVM400 can also record and generate transport streams. This functionality is controlled via an additional GUI. The features include the following:



Carousel analysis

- Seamless and endless generation of MPEG-2 transport streams
- Recording and replay of transport streams
- Extensive TS libraries
  For a detailed overview, see the Stream Libraries data sheet
- Software for generating transport streams
  The R&S®DV-ASC advanced stream combiner software option makes it possible to create transport streams for generation via the R&S®DVM400 generator hardware. The functions are described in the R&S®DV-ASC data sheet, PD 5213.7654.32.

Various interfaces for RF signals

A wide range of different RF standards are supported by the instruments of the R&S®DVM family. Since the RF inputs are integrated in the instruments, no additional space is required. It is possible to implement a flexible mix of different standards or to install several inputs of the same standard in one instrument. The demodulated signal is internally fed to the MPEG analyzis board and can simultaneously be monitored and analyzed like any other transport stream. Furthermore, the demodulated signal is available at the BNC connectors of the instrument for further external processing. The RF inputs are operated via the R&S®DVM GUI. Several RF characteristics can be monitored at the same time. A dedicated display shows the current measurement results in numeric format and as a constellation diagram.

A scan function supports sequential checking of several channels on one connector, thus saving space and money if continuous monitoring is not required. The definition of the different channels includes the basic RF parameters and the complete monitoring configuration. The monitoring configuration contains all RF and MPEG measurement configurations and template definitions. This allows effective, detailed, and customized monitoring of all RF and MPEG characteristics.

The following RF inputs are supported:

- DVB-T/H (2K and 8K modes)
- DVB-S/S2
- DVB-C
- J.83/B
- ATSC/8VSB

The following table provides a comparison of the instruments of the R&S®DVM family including options:

Base units					**Expansion unit**
	R&S®DVM50[1]	R&S®DVM100	R&S®DVM100L	R&S®DVM400	R&S®DVM120
					
Height	1 HU	1 HU	1 HU	4 HU	1 HU
Number of TS that can be monitored in parallel	1 to 4	1 to 4	1 to 4	1 to 4	1 to 4 (with RF inputs) 1 to 8 (without RF inputs)
Number of RF signals that can be demodulated and monitored in parallel	1 to 4	–	1 to 2	1 to 4	1 to 4
Expansion by the R&S®DVM120 for a total of:	–	20 TS and 16 RF inputs	20 TS and 18 RF inputs	20 TS and 20 RF inputs	–
Local operation	PC required	via external monitor, external keyboard, and mouse	via external monitor, external keyboard, and mouse	integrated color display, keys, and rotary knob; if necessary: external mouse and keyboard	via base units
Remote control	web server with 3 levels	web server with 3 levels	web server with 3 levels	web server with 3 levels	via base units
SNMP traps	yes	yes	yes	yes	via base units
Alarm relays	–	yes	yes	yes	via base units
TS monitoring and analysis including TS Capture	yes	yes	yes	yes	yes
ES and data service analysis	yes	yes	yes	yes	yes
Streaming function	via PC interface	yes	yes	yes	via base units
Software decoder	yes	yes	yes	yes	yes
Hardware decoder with various interfaces	yes	yes	yes	yes	yes
Recorder and generator options	–	–	–	yes	–
Gigabit Ethernet/IP interface, monitoring functions, and transcoding	–	–	–	yes	–
Reference clock input	–	–	–	yes	–
SPI input and output	–	–	–	yes	–

[1] The operation of the R&S®DVM50 requires a PC. Some of the functions specified are only available via the PC.

Examples of configurations

Example 1:
Monitoring at the transmitter site

The operator of a DVB-T network monitors the broadcast signals (2) at the transmitter site with respect to errors at the RF and transport stream level. Additionally, the operator monitors the transport streams fed to the transmitter. Neither detailed analyses nor transport stream recordings are required.

Instrument configuration

R&S®DVM100L		
1 ×	R&S®DVM100L	MPEG-2 Monitoring System
1 ×	R&S®DVM-B1	MPEG Analysis Board
4 ×	R&S®DVM-K1	TS Monitoring, activation of one channel
1 ×	R&S®DVM-B520	RF Carrier Board for R&S®DVM-B52
1 ×	R&S®DVM-B52	DVB-T/DVB-H Receiver Module, 2K and 8K modes
1 ×	R&S®DVM-K52	Second DVB-T/H Receiver Path

Example 2:
Monitoring at the multiplex center

The operator of a multiplex center checks the generated transport streams (6) for correctness. Part of the signals to be processed is received via satellite and cable (three DVB-S2 and six DVB-C signals). For reasons of cost, these signals are monitored only in the Scan mode (RF signals and included TS). For visualizing the broadcast programs (SD and HD, with MPEG-2 or H.264 coding) the operator uses external displays connected to the R&S®DVM100L/120. Occasionally, the operator performs analyses on the transport stream and records TS segments.

Instrument configuration

R&S®DVM100L		
1 ×	R&S®DVM100L	MPEG2 Monitoring System
1 ×	R&S®DVM-B1	MPEG Analysis Board
4 ×	R&S®DVM-K1	TS Monitoring, activation of one channel
1 ×	R&S®DVM-K2	TS Capture, recording by MPEG analysis board
1 ×	R&S®DVM-K10	In-Depth Analysis
1 ×	R&S®DVM-K12	TS Template Monitoring
1 ×	R&S®DVM-B500	RF Carrier Board for R&S®DVM-B50/B51
1 ×	R&S®DVM-B50	Demodulator Module
1 ×	R&S®DVM-K501	DVB-C, J.83/A/C Demodulation
1 ×	R&S®DVM-B51	DVB-S/DVB-S2 Receiver Module
1 ×	R&S®DVM-B30	Video and Audio Hardware Decoder (SDTV)
1 ×	R&S®DVM-K32	HDTV and Dolby Decoding Upgrade

and R&S®DVM120		
1 ×	R&S®DVM120	MPEG2 Monitoring System
1 ×	R&S®DVM-B1	MPEG Analysis Board
4 ×	R&S®DVM-K1	TS Monitoring, activation of one channel
1 ×	R&S®DVM-B30	Video and Audio Hardware Decoder (SDTV)
1 ×	R&S®DVM-K32	HDTV and Dolby Decoding Upgrade

Example 3:
DTV analyzer for portable use

The operator of a DVB-C network uses a portable instrument for checking both the broadcast signals (DVB-C) as well as the signals (Gigabit Ethernet) distributed on the backbone. To check the DVB-C signals, the operator requires high dynamic range during the MER measurement. The transport stream, elementary streams, or data services are analyzed and TS segments recorded. The operator displays the broadcast programs (SD and HD, with MPEG-2 or H.264 coding) directly on the instrument.

Instrument configuration

R&S®DVM400		
1 ×	R&S®DVM400	Digital Video Measurement System
1 ×	R&S®DVM400-B1	MPEG Analysis Board
1 ×	R&S®DVM-K1	TS Monitoring, activation of one channel
1 ×	R&S®DVM-K2	TS Capture, recording by MPEG analysis board
1 ×	R&S®DVM-K10	In-Depth Analysis
1 ×	R&S®DVM-K11	Data Broadcast Analysis
1 ×	R&S®DV-ESA	Elementary Stream Analyzer, MPEG-2 ES analysis
1 ×	R&S®DVM400-B30	Video and Audio Hardware Decoder (SDTV)
1 ×	R&S®DVM-K32	HDTV and Dolby Decoding Upgrade
1 ×	R&S®DVM400-B500	RF Carrier Board and Decoder Extension
1 ×	R&S®DVM-B50	Demodulator Module
1 ×	R&S®DVM-K501	DVB-C, J.83/A/C Demodulation
1 ×	R&S®DVM-K509	High-Quality MER Measurements
1 ×	R&S®DVM400-B40	Gigabit Ethernet Interface Module

Example 4:
Universal instrument in development
For the development of DTV components, a designer employs a jack-of-all-trades.

Instrument configuration

R&S®DVM400		
1 ×	R&S®DVM400	Digital Video Measurement System
Monitoring and analysis of transport streams		
1 ×	R&S®DVM400-B1	MPEG Analysis Board
1 ×	R&S®DVM-K1	TS Monitoring, activation of one channel
1 ×	R&S®DVM-K2	TS Capture, recording by MPEG analysis board
1 ×	R&S®DVM-K10	In-Depth Analysis
1 ×	R&S®DVM-K12	TS Template Monitoring
Data service and elementary stream analysis		
1 ×	R&S®DVM-K11	Data Broadcast Analysis
1 ×	R&S®DV-ESA	Elementary Stream Analyzer, MPEG-2 ES analysis
1 ×	R&S®DVM-K200	H.264 Analyzer
1 ×	R&S®DVM-K201	Dolby AC-3 Audio option for H.264 analyzer
Video and audio decoding		
1 ×	R&S®DVM400-B30	Video and Audio Hardware Decoder (SDTV)
1 ×	R&S®DVM-K30	HD/SD – SDI Video Output
1 ×	R&S®DVM-K32	HDTV and Dolby Decoding Upgrade
RF monitoring, analysis, and demodulation		
1 ×	R&S®DVM400-B500	RF Carrier Board and Decoder Extension
1 ×	R&S®DVM-B50	Demodulator Module
1 ×	R&S®DVM-K501	DVB-C, J.83/A/C Demodulation
1 ×	R&S®DVM-K502	J.83/B Demodulation
1 ×	R&S®DVM-K503	ATSC/8VSB Demodulation
1 ×	R&S®DVM-K509	High-Quality MER Measurements
1 ×	R&S®DVM-B51	DVB-S/DVB-S2 Receiver Module
1 ×	R&S®DVM-B52	DVB-T/DVB-H Receiver Module, 2K and 8K modes
Generation, recording, and replay of transport streams		
1 ×	R&S®DVM400-B2	TS Generator (GTS)
1 ×	R&S®DVM400-B3	Upgrade TS Recorder (TRP), up to 90 Mbit/s
1 ×	R&S®DVM400-B4	Upgrade TS Recorder (TRP), up to 214 Mbit/s
1 ×	R&S®DV-HDTV	HDTV Sequences
1 ×	R&S®DV-H264	H.264 Stream Library
1 ×	R&S®DV-DVBH	DVB-H Stream Library
1 ×	R&S®DV-TCM	Test Card M Sequences
1 ×	R&S®DV-ASC	Advanced Stream Combiner

Benefits

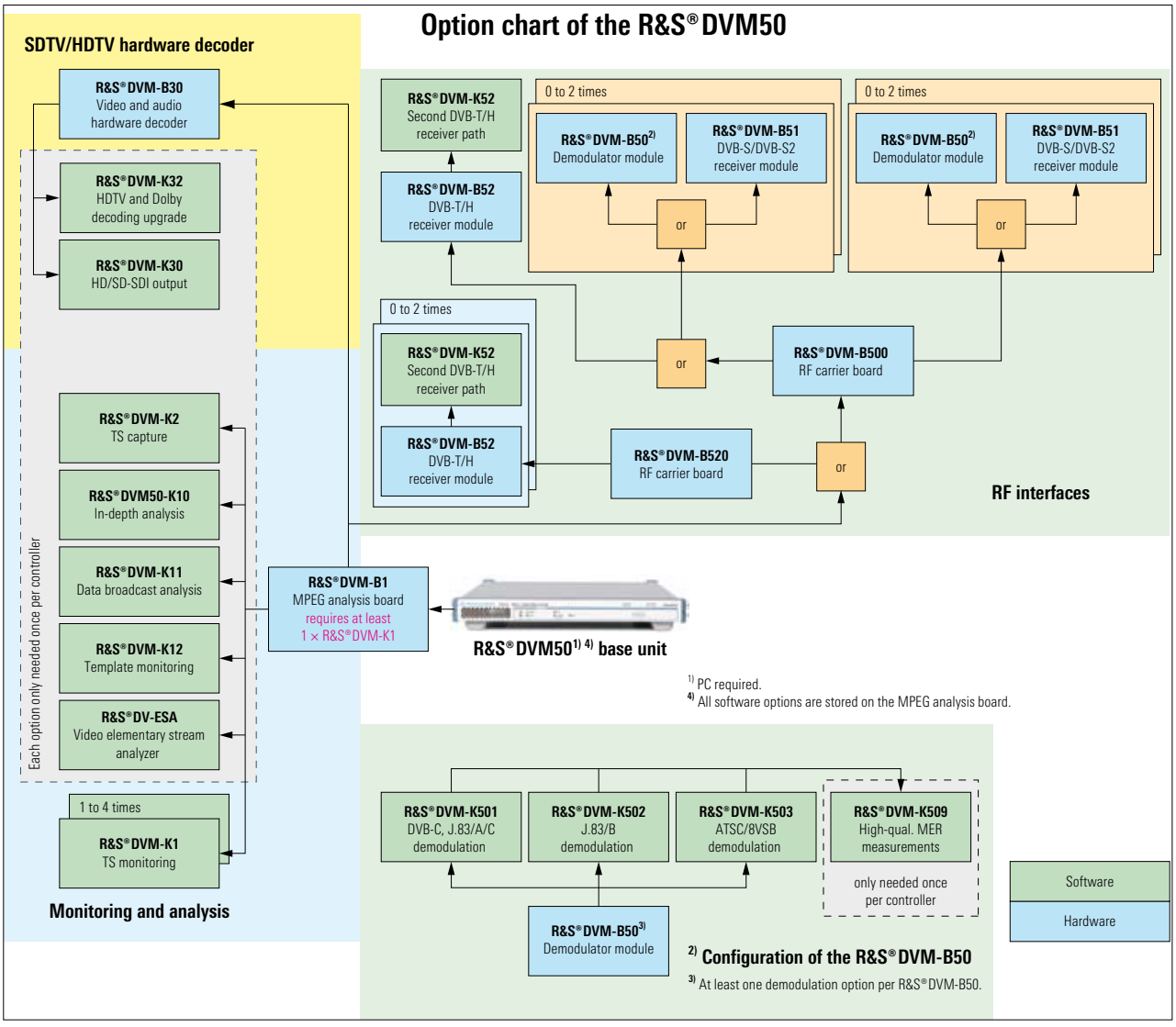
- Low installation effort due to low space requirements and combination of various functions in one instrument
- Low training effort due to intuitive operating concept
- Cost saving and long-term safety due to modular design
- Easy portable use due to low size and weight as well as integrated display (R&S®DVM400)

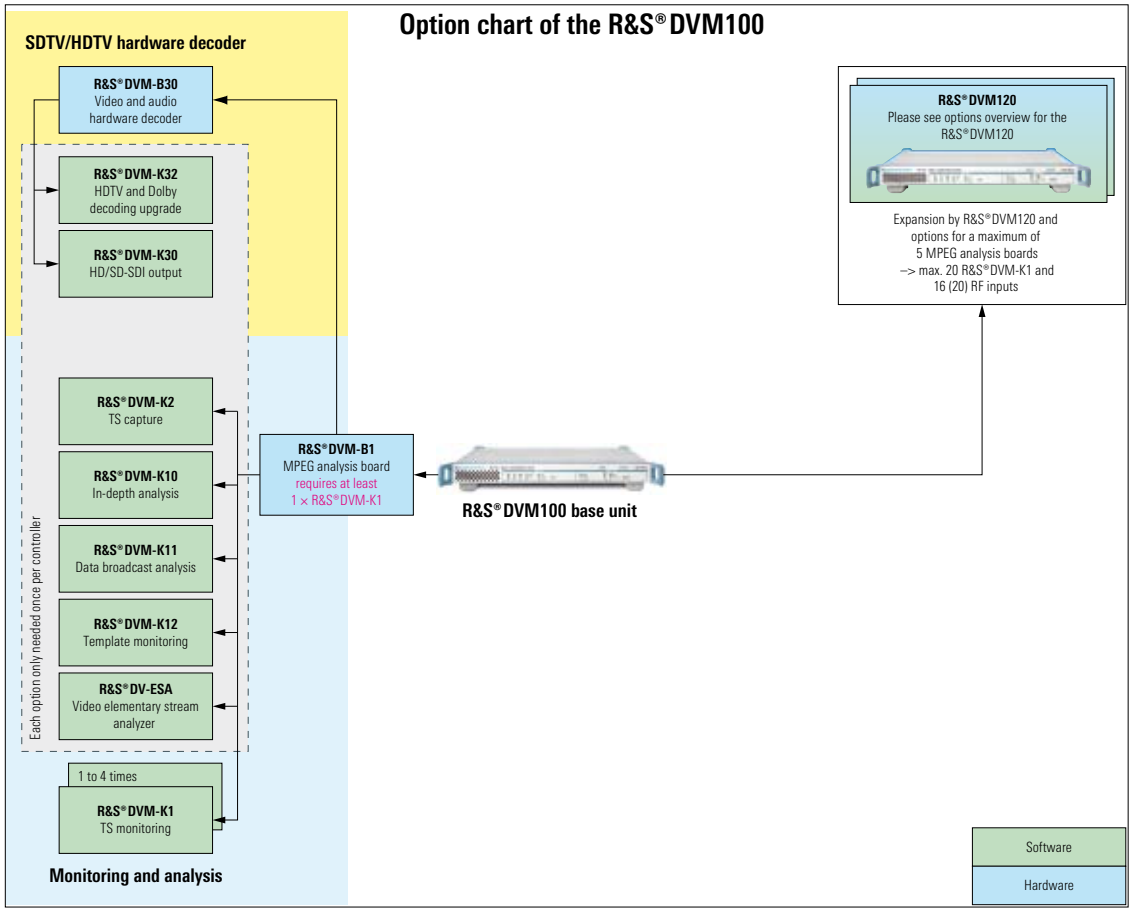
Ordering information

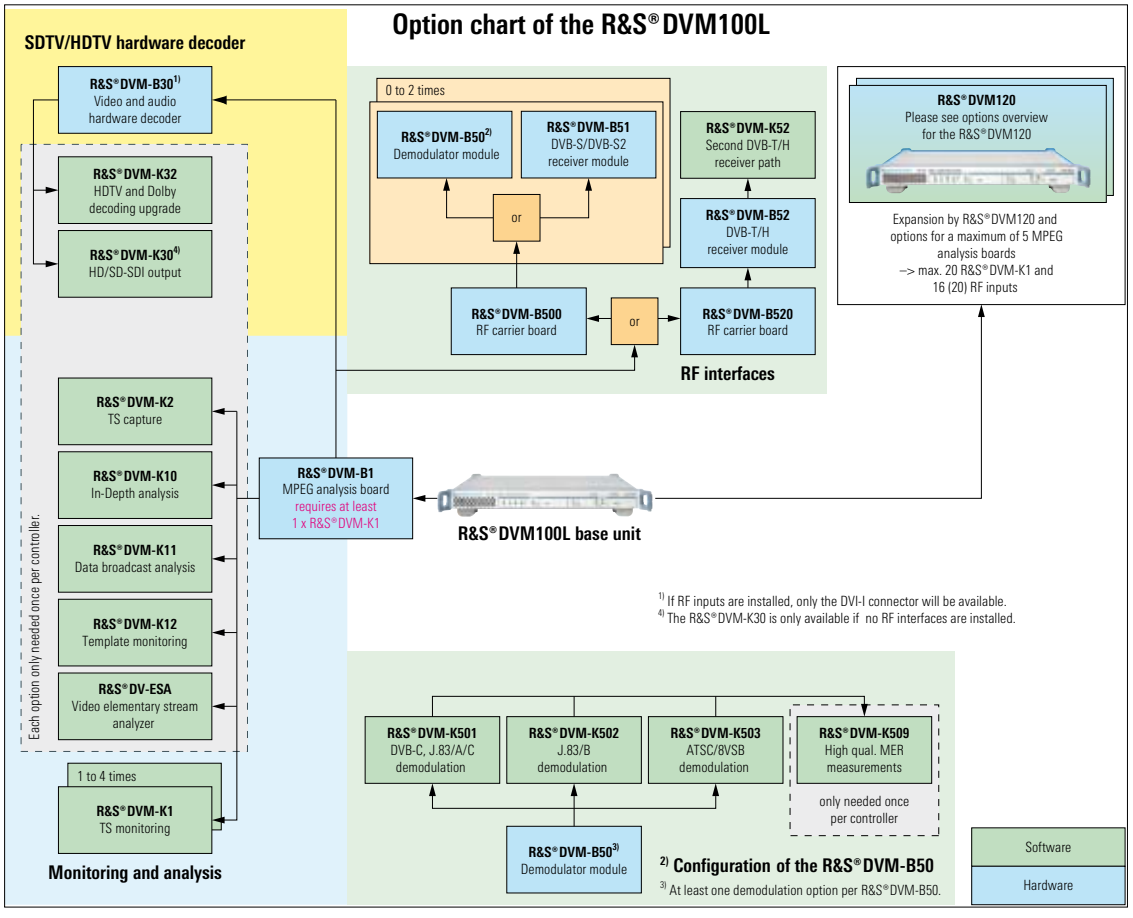
Designation	Type	Order No.
Base units		
MPEG-2 Monitoring System	R&S®DVM50	2085.1900.03
Accessories: manual, power cable, crossed patch cable, CD with firmware		
MPEG-2 Monitoring System	R&S®DVM100	2085.1600.03
Accessories: manual, power cable, crossed patch cable, CD with firmware, connector for relay contacts		
MPEG-2 Monitoring System	R&S®DVM100L	2112.7050.02
Accessories: manual, power cable, crossed patch cable, CD with firmware, connector for relay contacts		
Digital Video Measurement System	R&S®DVM400	2085.1800.03
Accessories: manual, mouse, power cable, crossed patch cable, CD with firmware, connector for relay contacts		
Expansion unit		
MPEG-2 Monitoring System	R&S®DVM120	2085.1700.03
Accessory: power cable, crossed patch cable		
Monitoring and analysis of transport streams		
MPEG Analysis Board	R&S®DVM-B1	2085.3283.02
MPEG Analysis Board	R&S®DVM400-B1	2085.5505.02
TS Monitoring Activation of one channel	R&S®DVM-K1	2085.5211.02
TS Capture Recording by MPEG analysis board	R&S®DVM-K2	2085.5234.02
In-Depth Analysis	R&S®DVM-K10	2085.5228.02
In-Depth Analysis	R&S®DVM50-K10	2085.5434.02
TS Template Monitoring	R&S®DVM-K12	2085.5328.02
Data service and elementary stream analysis		
Data Broadcast Analysis	R&S®DVM-K11	2085.5311.02
Elementary Stream Analyzer MPEG-2 ES analysis	R&S®DV-ESA	2085.8904.02
H.264 Analyzer	R&S®DVM-K200	2112.7850.02
Dolby AC-3 Audio Option for H.264 analyzer	R&S®DVM-K201	2112.7867.02
Maintenance for 12 months Option for H.264 analyzer	R&S®DVM-K209	2112.7873.02
Video and audio decoding		
Video and Audio Hardware Decoding Video: SDTV, MPEG-2, H.264 Audio: MPEG-1/2/4	R&S®DVM-B30	2085.5570.02
Video and Audio Hardware Decoding Video: SDTV, MPEG-2, H.264 Audio: MPEG-1/2/4	R&S®DVM400-B30	2085.5540.02
HD/SD – SDI Video Output	R&S®DVM-K30	2085.5440.02
HDTV and Dolby Decoding Upgrade	R&S®DVM-K32	2085.5486.02

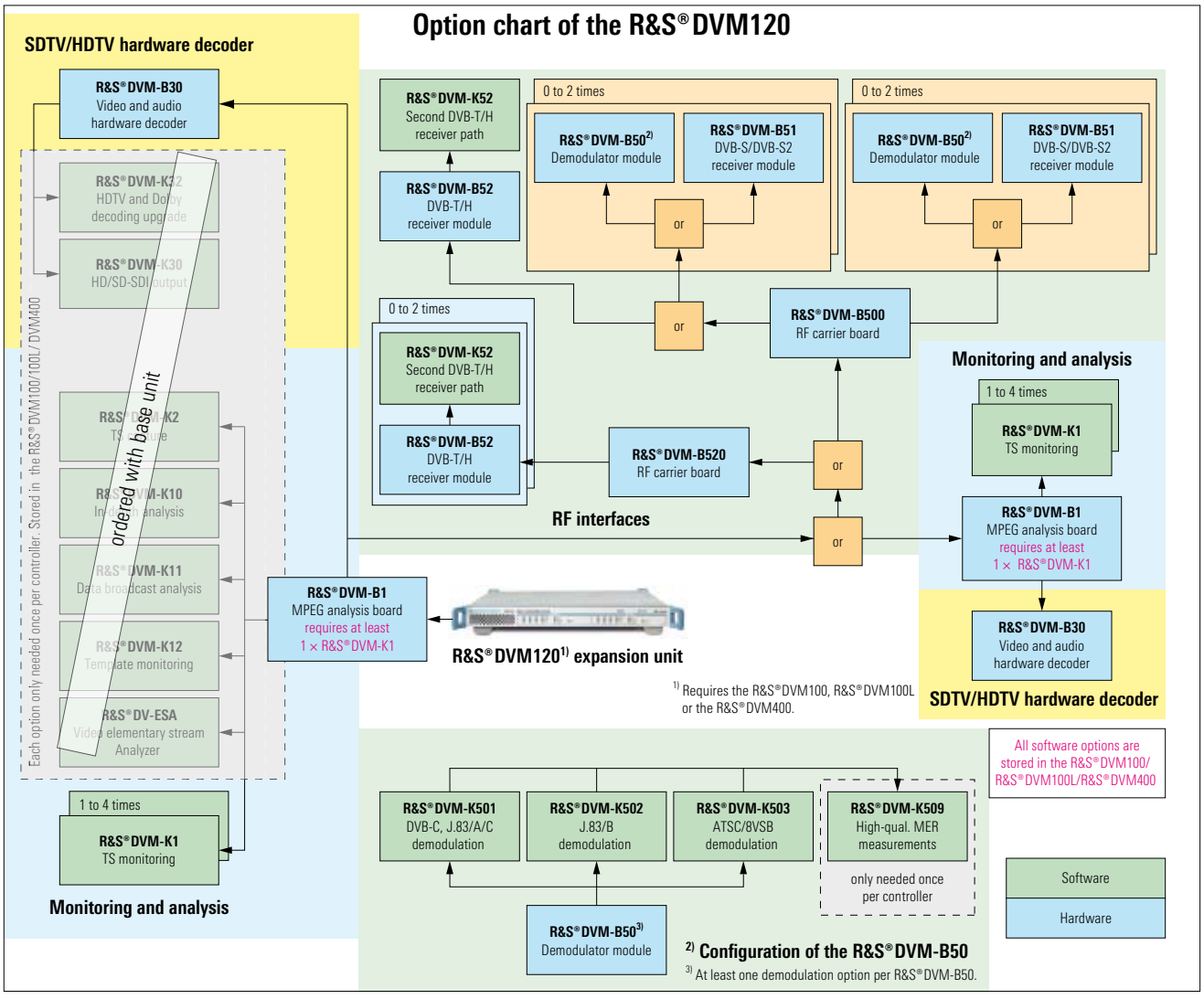
RF monitoring, analysis, and demodulation		
RF Carrier Board for R&S®DVM-B50/B51	R&S®DVM-B500	2085.5634.02
RF Carrier Board for R&S®DVM-B52	R&S®DVM-B520	2085.5640.02
RF Carrier Board and Decoder Extension	R&S®DVM400-B500	2085.5563.02
Demodulator Module	R&S®DVM-B50	2085.5605.02
DVB-C, J.83/A/C Demodulation	R&S®DVM-K501	2112.7815.02
J.83/B Demodulation	R&S®DVM-K502	2112.7821.02
ATSC/8VSB Demodulation	R&S®DVM-K503	2112.7838.02
High-Quality MER Measurements for R&S®DVM-K501/502/503	R&S®DVM-K509	2112.7844.02
DVB-S/DVB-S2 Receiver Module	R&S®DVM-B51	2085.5611.02
DVB-T/DVB-H Receiver Module, 2K and 8K modes	R&S®DVM-B52	2085.5628.02
Second DVB-T/H Receiver Path	R&S®DVM-K52	2085.5470.02
Monitoring, analysis, and transcoding of IPTV (R&S®DVM400 only)		
Gigabit Ethernet Interface Module	R&S®DVM400-B40	2085.5557.02
Generation, recording, and replay of transport streams (R&S®DVM400 only)		
TS Generator (GTS)	R&S®DVM400-B2	2085.5511.02
Upgrade TS Recorder (TRP) up to 90 Mbit/s	R&S®DVM400-B3	2085.5528.03
Upgrade TS Recorder (TRP) up to 214 Mbit/s	R&S®DVM400-B4	2085.5534.03
HDTV Sequences	R&S®DV-HDTV	2085.7650.02
H.264 Stream Library	R&S®DV-H264	2085.9052.02
DVB-H Stream Library	R&S®DV-DVBH	2085.8704.02
Test Card M Sequences	R&S®DV-TCM	2085.7708.02
Advanced Stream Combiner Dongle for USB interface	R&S®DV-ASC	2085.8804.03
Rack installation kits		
For R&S®DVM50/100/100L/120	R&S®ZZA-111	1096.3254.00
For R&S®DVM400	R&S®ZZA-S03	1105.6756.00
Accessories (external expansions)		
Memory Expansion to 2 Gbyte	R&S®DVM-B200	2085.5592.02
Type designation in line with SAP system: accessories (-Z), option (-B), software (-K).		

Option charts of the R&S®DVM Family

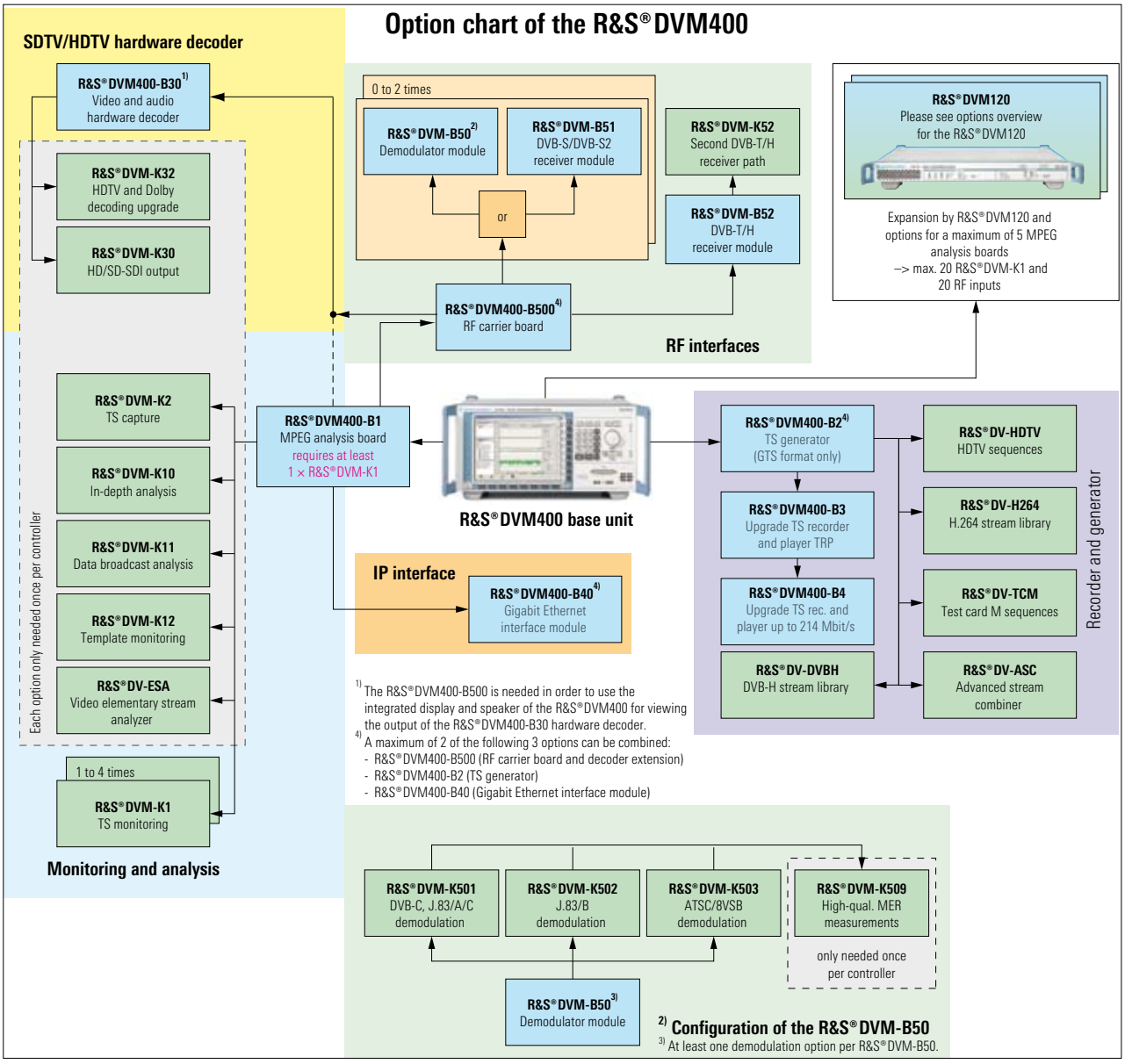



Option chart of the R&S®DVM100
SDTV/HDTV hardware decoder
R&S®DVM-B30
Video and audio hardware decoder
R&S®DVM-K32
HDTV and Dolby decoding upgrade
R&S®DVM-K30
HD/SD-SDI output
R&S®DVM120
Please see options overview for the R&S®DVM120
Expansion by R&S®DVM120 and options for a maximum of 5 MPEG analysis boards –> max. 20 R&S®DVM-K1 and 16 (20) RF inputs
R&S®DVM-K2
TS capture
R&S®DVM-K10
In-depth analysis
R&S®DVM-K11
Data broadcast analysis
R&S®DVM-K12
Template monitoring
R&S®DV-ESA
Video elementary stream analyzer
Each option only needed once per controller
R&S®DVM-B1
MPEG analysis board
requires at least
1 × R&S®DVM-K1
R&S®DVM100 base unit
1 to 4 times
R&S®DVM-K1
TS monitoring
Monitoring and analysis
Software
Hardware


Option chart of the R&S®DVM100L
SDTV/HDTV hardware decoder
R&S®DVM-B30 1)
Video and audio hardware decoder
R&S®DVM-K32
HDTV and Dolby decoding upgrade
R&S®DVM-K30 4)
HD/SD-SDI output
0 to 2 times
R&S®DVM-B50 2)
Demodulator module
R&S®DVM-B51
DVB-S/DVB-S2 receiver module
or
R&S®DVM-K52
Second DVB-T/H receiver path
R&S®DVM-B52
DVB-T/H receiver module
R&S®DVM-B500
RF carrier board
or
R&S®DVM-B520
RF carrier board
RF interfaces
R&S®DVM120
Please see options overview for the R&S®DVM120
Expansion by R&S®DVM120 and options for a maximum of 5 MPEG analysis boards –> max. 20 R&S®DVM-K1 and 16 (20) RF inputs
R&S®DVM-K2
TS capture
R&S®DVM-K10
In-Depth analysis
R&S®DVM-K11
Data broadcast analysis
R&S®DVM-K12
Template monitoring
R&S®DV-ESA
Video elementary stream analyzer
Each option only needed once per controller.
R&S®DVM-B1
MPEG analysis board
requires at least
1 x R&S®DVM-K1
R&S®DVM100L base unit
1 to 4 times
R&S®DVM-K1
TS monitoring
Monitoring and analysis
1) If RF inputs are installed, only the DVI-I connector will be available.
4) The R&S®DVM-K30 is only available if no RF interfaces are installed.
R&S®DVM-K501
DVB-C, J.83/A/C demodulation
R&S®DVM-K502
J.83/B demodulation
R&S®DVM-K503
ATSC/8VSB demodulation
R&S®DVM-K509
High qual. MER measurements
only needed once per controller
R&S®DVM-B50 3)
Demodulator module
2) Configuration of the R&S®DVM-B50
3) At least one demodulation option per R&S®DVM-B50.
Software
Hardware


Option chart of the R&S®DVM120
SDTV/HDTV hardware decoder
R&S®DVM-B30
Video and audio hardware decoder
R&S®DVM-K32
HDTV and Dolby decoding upgrade
R&S®DVM-K30
HD/SD-SDI output
ordered with base unit
Each option only needed once per controller. Stored in the R&S®DVM100/100L/DVM400
R&S®DVM-K2
TS interface
R&S®DVM-K10
Ingest/archive analysis
R&S®DVM-K11
Data broadcast analysis
R&S®DVM-K12
Template monitoring
R&S®DV-ESA
Video elementary stream Analyzer
1 to 4 times
R&S®DVM-K1
TS monitoring
Monitoring and analysis
R&S®DVM-B1
MPEG analysis board
requires at least
1 × R&S®DVM-K1
R&S®DVM120[1] expansion unit
R&S®DVM-K52
Second DVB-T/H receiver path
R&S®DVM-B52
DVB-T/H receiver module
0 to 2 times
R&S®DVM-B50[2]
Demodulator module
R&S®DVM-B51
DVB-S/DVB-S2 receiver module
or
R&S®DVM-B500
RF carrier board
R&S®DVM-B520
RF carrier board
RF interfaces
Monitoring and analysis
1 to 4 times
R&S®DVM-K1
TS monitoring
R&S®DVM-B1
MPEG analysis board
requires at least
1 × R&S®DVM-K1
R&S®DVM-B30
Video and audio hardware decoder
SDTV/HDTV hardware decoder
[1] Requires the R&S®DVM100, R&S®DVM100L or the R&S®DVM400.
R&S®DVM-K501
DVB-C, J.83/A/C demodulation
R&S®DVM-K502
J.83/B demodulation
R&S®DVM-K503
ATSC/8VSB demodulation
R&S®DVM-K509
High-qual. MER measurements
only needed once per controller
R&S®DVM-B50[3]
Demodulator module
[2] Configuration of the R&S®DVM-B50
[3] At least one demodulation option per R&S®DVM-B50.
All software options are stored in the R&S®DVM100/ R&S®DVM100L/R&S®DVM400
Software
Hardware

Option chart of the R&S®DVM400



1) The R&S®DVM400-B500 is needed in order to use the integrated display and speaker of the R&S®DVM400 for viewing the output of the R&S®DVM400-B30 hardware decoder.

4) A maximum of 2 of the following 3 options can be combined:
- R&S®DVM400-B500 (RF carrier board and decoder extension)
- R&S®DVM400-B2 (TS generator)
- R&S®DVM400-B40 (Gigabit Ethernet interface module)

2) Configuration of the R&S®DVM-B50

3) At least one demodulation option per R&S®DVM-B50.

For specifcations, see PD 5213.5274.22
and www.rohde-schwarz.com
(search term: DVM)

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