

R&S® DVSG

Digital Video Signal Generator

Specifications



75 Years of
Driving
Innovation

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Specifications apply under the following conditions: 30 minutes warm-up time at ambient temperature, specified environmental conditions met, calibration cycle adhered to, and all internal automatic adjustments performed. "Typical values" are designated with the abbreviation "typ." These values are verified during the final test but are not assured by Rohde & Schwarz. "Nominal values" are design parameters that are not assured by Rohde & Schwarz. These values are verified during product development but are not specifically tested during production.

Rohde & Schwarz equipment is designed for reliable operation up to an altitude of 3000 m above sea level, and for transport up to an altitude of 4500 m above sea level.

Data without tolerance limits is not binding.

AV signal generator (R&S® DVSG-K10 option)

Video standard and interface	HDMI	BNC	SCART ¹	D4 ¹	VGA
Video resolutions					
Standard definition					
480i; 59 Hz RGB / YC _b C _r / YP _b P _r / NTSC	●/●/-/-	●/-/●/●	●/-/●/●	●/-/●/●	-
480i; 60 Hz RGB / YC _b C _r / YP _b P _r / NTSC	●/●/-/-	●/-/●/●	●/-/●/●	●/-/●/●	-
576i; 50 Hz RGB / YC _b C _r / YP _b P _r / PAL	●/●/-/-	●/-/●/●	●/-/●/●	●/-/●/●	-
High definition					
480p; 59 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●	not defined	●/-/●	-
480p; 60 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	(●/-/●) ²		(●/-/●) ²	-
576p; 50 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●		●/-/●	-
720p; 50 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●		●/-/●	-
720p; 59 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●		●/-/●	-
720p; 60 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●		●/-/●	-
1080i; 50 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●		●/-/●	-
1080i; 59 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●		●/-/●	-
1080i; 60 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●		●/-/●	-
1080p; 50 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	-/-/-		-/-/-	-
1080p; 59 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	-/-/-		-/-/-	-
1080p; 60 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	-/-/-		-/-/-	-
1080p; 24 Hz RGB / YC _b C _r / YP _b P _r	●/●/-	●/-/●		-/-/-	-
Computer formats ²	in line with VESA				
Color depths					
8 bit	●	●	●	●	-
10 bit ³	●	●	●	●	-
12 bit ³	●	-	-	-	-
Basic signal library					
More than 120 still pictures and moving pictures with different resolution and in raw data format for geometry, brightness, contrast, color measurement					
Storage medium					
Hard disk	total: 250 Gbyte min. available: 160 Gbyte				

¹ SCART and D4 cannot be used in parallel.

² Available in future firmware version.

³ For RGB available in future FW version.

AV signal player (R&S[®] DVSG-B30 option)

Video standard and interface	HDMI	BNC	SCART ⁴	D4 ⁴	SDI/HD-SDI
Video resolutions					
Standard definition					
480i; 59 Hz RGB / YC _b C _r / YP _b P _r / NTSC	● / ● / - / -	● / - / ● / ●	● / - / ● / ●	● / - / ● / ●	- / ● / - / -
480i; 60 Hz RGB / YC _b C _r / YP _b P _r / NTSC	(● / ● / - / -) ⁵	(● / - / ● / ●) ⁵	(● / - / ● / ●) ⁵	(● / - / ● / ●) ⁵	(- / ● / - / -) ⁵
576i; 50 Hz RGB / YC _b C _r / YP _b P _r / PAL	● / ● / - / -	● / - / ● / ●	● / - / ● / ●	● / - / ● / ●	- / ● / - / -
High definition					
480p; 59 Hz RGB / YC _b C _r / YP _b P _r	(● / ● / -) ⁵	(● / - / ●) ⁵	not defined	(● / - / ●) ⁵	(- / ● / -) ⁵
480p; 60 Hz RGB / YC _b C _r / YP _b P _r	(● / ● / -) ⁵	(● / - / ●) ⁵		(● / - / ●) ⁵	(- / ● / -) ⁵
576p; 50 Hz RGB / YC _b C _r / YP _b P _r	(● / ● / -) ⁵	(● / - / ●) ⁵		(● / - / ●) ⁵	(- / ● / -) ⁵
720p; 50 Hz RGB / YC _b C _r / YP _b P _r	● / ● / -	● / - / ●		● / - / ●	- / ● / -
720p; 59 Hz RGB / YC _b C _r / YP _b P _r	● / ● / -	● / - / ●		● / - / ●	- / ● / -
720p; 60 Hz RGB / YC _b C _r / YP _b P _r	● / ● / -	● / - / ●		● / - / ●	- / ● / -
1080i; 50 Hz RGB / YC _b C _r / YP _b P _r	● / ● / -	● / - / ●		● / - / ●	- / ● / -
1080i; 59 Hz RGB / YC _b C _r / YP _b P _r	● / ● / -	● / - / ●		● / - / ●	- / ● / -
1080i; 60 Hz RGB / YC _b C _r / YP _b P _r	● / ● / -	● / - / ●		● / - / ●	- / ● / -
1080p; 50 Hz RGB / YC _b C _r / YP _b P _r	- / - / -	- / - / -		- / - / -	- / - / -
1080p; 59 Hz RGB / YC _b C _r / YP _b P _r	- / - / -	- / - / -		- / - / -	- / - / -
1080p; 60 Hz RGB / YC _b C _r / YP _b P _r	- / - / -	- / - / -		- / - / -	- / - / -
1080p; 24 Hz RGB / YC _b C _r / YP _b P _r	- / - / -	- / - / -		- / - / -	- / - / -
Color depths					
8 bit	●	●	●	●	●
Video resolution conversion					
All input formats	to 1920 × 1080i; 1280 × 720p; 720 × 480i/576i				
Audio support					
Mono, stereo, up to 8 channels ⁵					
Basic signal library					
Continuously extended library containing:					
<ul style="list-style-type: none"> • Test pattern (still and moving) <ul style="list-style-type: none"> - For tests of color, geometry, motion blur, pixel overdrive, contrast - ITU test lines (SD only) - Teletext (SD only) • Critical live sequences <ul style="list-style-type: none"> - Natural sequences with typical artifacts such as noise, film judder, blocking and other coding artifacts • Promotion sequences <ul style="list-style-type: none"> - High-quality sequences for display promotion 					
Storage medium					
Hard disk	total: 250 Gbyte min. available: 160 Gbyte				
Custom pattern					
Format	MPEG-2 transport stream in line with ISO/IEC 1-13818				
File type	TS, TRP, GTS, AVP				
Video coding	MPEG-2 (MP@ML) MPEG-2 (MP@ML) H.264/AVC (MP) H.264/AVC (MP)				
Audio coding	MPEG-1/MPEG-2 layer I, AC3				
Max. length of moving pictures	up to hard disk volume				

⁴ SCART and D4 cannot be used in parallel.

⁵ Available in future firmware version.

TS player and recorder (R&S® DVSG-K20 option)

Playing of Rohde & Schwarz TS seamless loop library

Format		in line with ISO/IEC 1-13818
File type	MPEG-2 transport stream	GTS (Rohde & Schwarz proprietary)
Sequence length		endless and seamless generation with repetition of video, audio, and data contents
Data rate		675 kbit/s to 214 Mbit/s (including null packets)
Useful data rate		max. 90 Mbit/s
Data volume		max. 80 Mbyte useful data
Storage medium	hard disk	total: 250 Gbyte min. available: 160 Gbyte
Basic signal set		selection of transport streams for testing MPEG-2 SDTV (25 Hz, 29.97 Hz) signal processing; general DVB and ATSC transport stream testing; moving picture sequences and test patterns with test tones for 625 and 525 lines (For detailed information, refer to the "Stream Libraries for Rohde & Schwarz TS Generators" data sheet. Further transport streams are available as options; see below.)
Interface characteristics	simultaneous output	2 × ASI / SMPTE 310M ⁶ , 1 × SPI
Length of transport stream packets	ATSC	188/208 byte (settable)
	DVB	188/204 byte (settable)
PCR jitter	form	sine, rectangle, and triangle
	frequency	1 mHz to 100 kHz
	amplitude	0 ms to 10 ms
	increment	0.1 μs

Playing of TS and binary bit stream

Format		in line with ISO/IEC 1-13818
File type	MPEG-2 transport stream (binary format)	8 bit 10 bit
Max. file size		limited only by size of hard disk
Min. data rate		125 kbit/s
Max. data rate	buffer	214 Mbit/s
	hard disk	min. 90 Mbit/s typ. 214 Mbit/s
Storage medium	hard disk	total: 250 Gbyte min. available: 160 Gbyte
Interface characteristics		
Supported interfaces	simultaneous output	2 × ASI / SMPTE 310M ⁶ , 1 × SPI
Number of signals that can be replayed/generated simultaneously		1
Determination of data rates	automatic or manual	on the basis of the obtained PCR values
Endless replay		frame-exact cut at transition from end of file to beginning of file
Seamless loop ⁶ (realtime update of TS values)	selectable	continuity counter PCR/PTS/DTS TOT/TDT

⁶ Available in future firmware version

Recording of TS bit stream

Format		in line with ISO/IEC 1-13818
File type	MPEG-2 transport stream (binary format)	8 bit 10 bit
TS packet length	in line with recorded signal	188/204 byte
Max. file size		limited only by size of hard disk
Min. data rate		125 kbit/s
Max. data rate	buffer	214 Mbit/s
	hard disk	min. 90 Mbit/s typ. 214 Mbit/s

Transport stream libraries and tools

SDTV sequences	part of R&S®DVSG-K20 option	selection of transport streams for testing MPEG-2 SDTV (25 Hz, 29.97 Hz) signal processing; general DVB and ATSC transport stream testing
HDTV sequences	R&S®DV-HDTV	selection of transport streams for testing MPEG-2 HDTV signal processing
H.264 stream library	R&S®DV-H264	selection of transport streams for testing H.264 SDTV and HDTV signal processing
DVB-H stream library	R&S®DV-DVBH	selection of transport streams for testing entire DVB-H signal processing chain
Test Card M sequences	R&S®DV-TCM	selection of transport streams for testing various DTV receiver and decoder STB functions
ISDB-T stream library	R&S®DV-ISDBT	selection of transport streams for testing SDTV and HDTV signal processing
Advanced stream combiner	R&S®DV-ASC	comprehensive software tool for generating transport stream files in GTS (Rohde & Schwarz proprietary) or TRP format

For detailed information, refer to the "Stream Libraries for Rohde & Schwarz TS Generators" data sheet.

Signal interface characteristics

Signal interfaces for AV signal generator and AV signal player

Analog composite video		
Connector	CCVS	1 × BNC, female 75 Ω
	SCART	1 × SCART 75 Ω
Standard		NTSC M/N (SMPTE 170M), PAL B/G/M/N (ITU-R BT.470)
Luminance level	nominal, NTSC	714 mV ± 1.5 %
	nominal, PAL	700 mV ± 1.5 %
Sync level	nominal, NTSC	285.5 ± 1.5 %
	nominal, PAL	300 mV ± 1.5 %
Burst amplitude	nominal, NTSC	285.5 mV ± 2.0 %
	nominal, PAL	300 mV ± 2.0 %
Chrominance level	nominal, NTSC	714 mV ± 2.5 %
	nominal, PAL	700 mV ± 2.5 %
DC pedestal	selectable, NTSC	0 IRE; +7.5 IRE
Luminance signal-to-noise ratio	quiet line, weighted	>83 dB
	quiet line, unweighted	>77 dB
SC/H phase	nominal, PAL NTSC	0° ± 5°

Analog component video		
Connector	G/Y, B/P _b , R/P _r	3 × BNC, female 75 Ω
	SCART	1 × SCART 75 Ω
	D4	14-pin D video connector, female
Standard		RGB, YP _b P _r (SMPTE/EBU N10 and SMPTE 274M)
Video format		SDTV, HDTV
Synchronization	SDTV	bi-level
	HDTV	tri-level
	GBR	G
	YP _b P _r	Y
Level	nominal	700 mV ± 2.0 %

Analog S-Video		
Connector	S-VIDEO	4-pin mini DIN 75 Ω
	SCART	1 × SCART 75 Ω
Standard		Y, C (PAL and NTSC)

Analog video – VGA ⁷		
Connector		VGA 15-pin D-Sub, female, rear
Standard		RGB (VESA)

⁷ Available in future firmware version.

Digital video – HDMI		
Connector	HDMI	high-definition multimedia interface, 19-pin, female, rear
Version		HDMI 1.3 compatible
Maximum resolution	AV signal player	16 bit YCbCr, 4:2:2; 24 bit RGB 4:4:4
	AV signal generator	24 bit YCbCr/RGB 4:4:4
DVI Mode	RGB only, no audio, no AVI Info frame (Auxiliary Video Info)	ON, OFF
HDCP ⁸	switchable	ON, OFF (standard)
Display data channel (DDC) ⁸		display of sink device information

SCART interface signaling		
Input selection		composite component Y/C
Format (WSS)		OFF, 4:3, 16:9

Digital video – SDI/HD-SDI (R&S®DVSG-K30 option)		
Connector	HD-SDI	1 × BNC, female, rear 75 Ω
Standard	SDI	in line with SMPTE 259M 270 Mbit/s
	HD-SDI	in line with SMPTE 292M 1.485 Gbit/s

Analog audio		
Connector	L-Out, R-Out	RCA jack, female
	SCART	1 × SCART

Digital audio		
Connector	HDMI	19-pin HDMI, female
	AUDIO DIG OUT	TOSLINK, optical
	SDI/HD-SDI	BNC, embedded audio

Digital audio – input⁸		
Connector	AUDIO DIG IN	TOSLINK, optical

Reference clock – input⁸		
Connector	REF CLK IN	1 × BNC, female, rear 75 Ω
Nominal input frequency		10 MHz
Nominal input level		0.1 V to 2 V (rms)

⁸ Available in future firmware version.

Signal interface for MPEG-2 transport stream player and recorder

Serial inputs		
Number		1, rear
Connector		BNC 75 Ω
Mode		ASI, SMPTE 310M ⁹ (user-selectable)
ASI		in line with EN 50083-9 (2002) 270 Mbit/s; 188/204 byte
SMPTE 310M		in line with BP 400 SMPTE 19.392658 Mbit/s 188 byte
Maximum cable length		180 m

Serial outputs		
Number		1, front 1, rear
Connector		BNC 75 Ω

Mode		ASI, SMPTE 310M ⁹ (user-selectable)
ASI		in line with EN 50083-9 (2002) 270 Mbit/s; 188/204 byte (selectable) packet/continuous (selectable)
SMPTE 310M		in line with BP 400 SMPTE 19.392658 Mbit/s 188 byte
Maximum cable length		180 m

Parallel input/output (switchable)		
Number		1, rear
Connector		25-pin, female, rear
Synchronous parallel interface		SPI, in line with EN 50083-9
Level		LVDS
Clock		84.375 kHz to 20 MHz
Mode	8 bit (TRP)	8 bit data
	10 bit (T10)	8 bit data, 1 bit data valid, 1 bit packet sync

⁹ Available in future firmware version.

General data of base unit

System data

System	operating system	PC platform Windows® XP Embedded 250 Gbyte internal hard disk
Local control	display	VGA 640 x 480 pixel
	control	rotary knob, hardkeys, and softkeys
Extended local control		external mouse and keyboard via USB
Remote control	command set	SCPI 1999.5
	interface	Ethernet 10/100BaseT
Connectors		
Ethernet		RJ-45, rear
USB		USB 2.0, front and rear
AC supply input		IEC 60320 C14, rear

Operating data

Power supply	input voltage range, AC supply frequency	100 V to 240 V ± 10 % 50 Hz to 60 Hz ± 5 % 1.8 A to 0.8 A
Electromagnetic compatibility		in line with EN 55011 class B, EN 61326
	power factor correction	in line with EN 61000-3-2
Immunity against RF fields		up to 10 V/m
Environmental conditions		
Operating temperature range ¹⁰		+5 °C to +45 °C in line with EN 60068-2-1, EN 60068-2-2
Storage temperature range		-20 °C to +60 °C
Climatic resistance, cyclic test at +25 °C/+40 °C		85 % rel. humidity
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 150 Hz, max. 2 g at 55 Hz, 55 Hz to 150 Hz, 0.5 g constant, in line with EN 60068-2-6
	random	10 Hz to 300 Hz, acceleration 1.2 g (rms), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with EN 60068-2-27, MIL-STD-810E
Electrical safety		in line with IEC 61010-1, EN 61010-1 and UL 61010-1, CSA C22.2 No. 61010-1
Dimensions	W x H x D	235 mm x 155 mm x 465 mm (three height units) (9.25 in x 6.11 in x 18.3 in)
Weight	fully equipped	5.6 kg (12.35 lb)
Recommended calibration interval		3 years
Standard warranty period		1 year

¹⁰ Reduced LCD brightness at higher operating temperatures.

Ordering information

Designation	Type	Order No.
Base unit		
Digital Video Signal Generator	R&S®DVSG	2113.0008.02
Accessories: printed quick start guide, operating manual with firmware on CD, power cable		
Options		
TS Player and Recorder	R&S®DVSG-K20	2113.0320.02
AV Signal Player	R&S®DVSG-B30	2113.0237.02
AV Signal Generator	R&S®DVSG-K10	2113.0314.02
SDI/HD-SDI Output	R&S®DVSG-K30	2113.0337.02
Stream libraries		
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
ISDB-T Stream Library	R&S®DV-ISDBT	2085.9146.02
TS creation tool		
Advanced Stream Combiner (dongle for USB interface)	R&S®DV-ASC	2085.8804.03

Recommended extras		
Printed operating manual (English)		2113.1862.12
Keyboard with USB Interface (US keyboard)	R&S®PSL-Z2	1157.6870.04
Mouse with USB Interface, optical	R&S®PSL-Z10	1157.7060.02
19" Adapter (R&S®DVSG with second instrument)	R&S®ZZA-T33	1109.4458.00
19" Adapter (R&S®DVSG with spare slot)	R&S®ZZA-T34	1109.4464.00
Documentation of R&S®DVSG Calibration Values	R&S®DVSG-DCV	2082.0490.33

Service options (Service options can only be ordered in connection with the purchase of an instrument.)		
Repair service		
One-Year Repair Service following the warranty period	R&S®RO2DVSG	please contact your local sales office
Two-Year Repair Service following the warranty period	R&S®RO3DVSG	please contact your local sales office
Four-Year Repair Service following the warranty period	R&S®RO5DVSG	please contact your local sales office
Calibration service		
Two-Year Calibration Service	R&S®CO2DVSG	please contact your local sales office
Three-Year Calibration Service	R&S®CO3DVSG	please contact your local sales office
Five-Year Calibration Service	R&S®CO5DVSG	please contact your local sales office

Option identification: R&S®DVSG-Bxxx = hardware option; R&S®DVSG-Kxxx = software option.

Service you can rely on

- | In 70 countries
- | Person-to-person
- | Customized and flexible
- | Quality with a warranty
- | No hidden terms

About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

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Certified Quality System
ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System
ISO 14001
DQS REG. NO 1954 UM

For product brochure,
see PD 5213.9892.12
and www.rohde-schwarz.com

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*0,14 €/min within German wireline network; rates may vary in other networks (wireline and mobile) and countries.