

ROHDE & SCHWARZ

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R&S® PRISMON AUDIO/VIDEO CONTENT MONITORING AND MULTIVIEWER

Specifications

R&S® PRISMON
Monitoring Solutions

R&S® PRISMON
Multiviewer Solutions

Data Sheet | Version 15.00



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Definitions

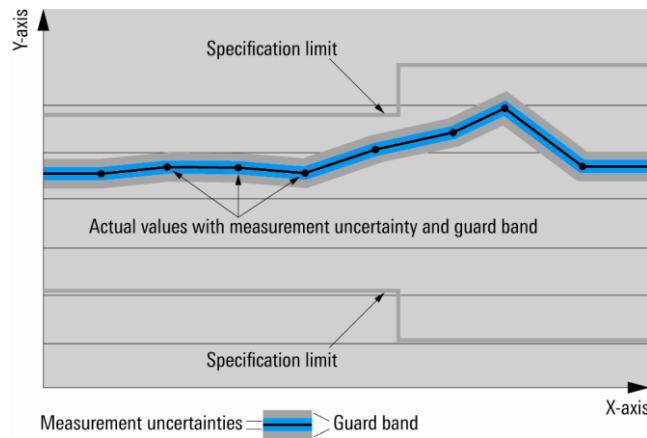
General

Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits

Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as $<$, \leq , $>$, \geq , \pm , or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Specifications without limits

Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)

Characterizes product performance by means of representative information for the given parameter. When marked with $<$, $>$ or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)

Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)

Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties

Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are indicated as follows: "parameter: value".

Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP/3GPP2 standard, chip rates are specified in Mcps (million chips per second), whereas bit rates and symbol rates are specified in Gbps (billion bits per second), Mbps (million bits per second), kbps (thousand bits per second), Msps (million symbols per second) or ksps (thousand symbols per second), and sample rates are specified in Msample/s (million samples per second). Gbps, Mcps, kbps, Msps, ksps and Msample/s are not SI units.

All data quoted represent values valid at input and output interfaces of the device; data for internal processing may differ with respect to e.g. frame rate, resolution, bit-depth and sampling.

General data

R&S®PRM-BU110 base system – R&S®PRISMON BASE

Mechanical and electrical specifications

Mechanical specifications		
Dimensions	rack units	1 RU
Slots for optional interfaces		<ul style="list-style-type: none"> 1 slot (high profile) for optional extension I/O card 1 slot (low profile) for optional extension graphics card
Electrical specifications		
Power supply		100 V to 240 V AC, 50/60 Hz
Redundant power supply		optional

Built-in interfaces

Network interfaces		<ul style="list-style-type: none"> 2 × RJ-45 ports 10/100/1000BASE-T
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R&S®PRM-BU140 base system – R&S®PRISMON ULTRA

Mechanical and electrical specifications

Mechanical specifications		
Dimensions	rack units	1 RU
Slots for optional interfaces		<ul style="list-style-type: none"> 1 slot (high profile) for optional extension graphics card 1 slot (low profile) for optional extension I/O card
Electrical specifications		
Power supply		100 V to 240 V AC, 50/60 Hz
Redundant power supply		optional

Built-in interfaces

Network interfaces		<ul style="list-style-type: none"> 4 × RJ-45 ports 10/100/1000BASE-T
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R&S®PRM-BU220 base system – R&S®PRISMON PLUS X

Mechanical and electrical specifications

Mechanical specifications		
Dimensions	rack units	2 RU
Slots for optional interfaces		<ul style="list-style-type: none"> 4 slots (high profile) for optional extension I/O cards 2 slots (low profile) for optional extension graphics card
Electrical specifications		
Power supply		100 V to 240 V AC, 50/60 Hz
Redundant power supply		optional

Built-in interfaces

Network interfaces		<ul style="list-style-type: none"> 4 × RJ-45 ports 10/100/1000BASE-T
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R&S®PRM-BU230 base system – R&S®PRISMON PRIME X

Mechanical and electrical specifications

Mechanical specifications		
Dimensions	rack units	2 RU
Slots for optional interfaces		<ul style="list-style-type: none"> 4 slots (high profile) for optional extension I/O cards 2 slots (low profile) for optional extension graphics card
Electrical specifications		
Power supply		100 V to 240 V AC, 50/60 Hz
Redundant power supply		optional

Built-in interfaces

Network interfaces		<ul style="list-style-type: none"> 4 × RJ-45 ports 10/100/1000BASE-T
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For the complete mechanical, electrical and environmental specifications of the various base units, please refer to each unit's dedicated data sheet on the manufacturer's website (R&S®PRM-BU110/140/220/230 = DELL PowerEdge R340/440/740/740).

Processing capacity for R&S®PRM-BU110/140/220/230

Max. video decoding capabilities (figures valid with one active 1080p30 streaming output ¹)						
	Maximum number of SD/HD/UHD input services ²					
	SMPTE ST 2022-2/ASI			SMPTE ST 2022-6 ³	SMPTE ST 2110-20 ^{3,4}	SDI
	MPEG-2	H.264	H.265/HEVC	uncompressed	uncompressed	uncompressed
R&S®PRISMON BASE	30 / 8 / –	20 / 14 / –	14 / 8 / –	–	–	8 / 8 / 1
R&S®PRISMON ULTRA	72 / 25 / –	72 / 50 / –	60 / 36 / 6	43 / 22 / –	49 / 25 / 3	–
R&S®PRISMON PLUS X	72 / 25 / –	72 / 36 / –	30 / 18 / –	29 / 15 / –	29 / 15 / 3	16 / 16 / 4
R&S®PRISMON PRIME X	72 / 25 / –	72 / 48 / –	60 / 34 / 4	43 / 22 / –	59 / 30 / 4	24 / 24 / 6

¹ If more than one streaming output is enabled, service count will decrease.

² Definition of SD/HD/UHD service: 576p30/1080p30/2160p60.

³ If 2022-7 is enabled, service count decreases by 30 %.

⁴ Used color space: YCbCr-4:2:2-10 bit.

Optional components for R&S®PRM-BU110/140/220/230

Optional input interfaces

PRIOS-M SDI/ASI broadcast input card (R&S®PRM-B1000)		
Interface card options	requires 1 slot	
Physical connector and input format	for compressed (ASI)/uncompressed(SDI) video up to UHD with ancillary data and up to 16 embedded audio channels	<ul style="list-style-type: none"> • up to 2 x 3G-SDI/ASI video SFP (emSFP) receiver module • 1 x interface to breakout box
3G-SDI/ASI video SFP (R&S®AVS-B1100)		
Interfaces		
Physical connector and input format	for 2 x uncompressed SDTV with ancillary data and up to 16 embedded audio channels	2 x SD-SDI; 75 Ω BNC; 270 Mbit/s; 800 mV (V _{pp}); in line with SMPTE ST 259M-C
	for 2 x uncompressed HDTV up to a resolution of 1080i with ancillary data and up to 16 embedded audio channels	2 x HD-SDI; 75 Ω BNC; 1485 Gbit/s, 1485/1001 Gbit/s; 800 mV (V _{pp}); in line with SMPTE ST 292M
	for 2 x uncompressed HDTV up to a resolution of 1080p, each with ancillary data and up to 16 embedded audio channels	2 x 3G-SDI; 75 Ω BNC; 2970 Gbit/s, 2970/1001 Gbit/s; 800 mV (V _{pp}); in line with SMPTE 424M with level A or level B dual link (DL)
	for compressed video and audio in an MPEG-2 transport stream with ancillary data	2 x ASI; BNC, 75 Ω; 270 Mbit/s; 800 mV (V _{pp}); in line with EN 50083-9
SDI/ASI BNC breakout box (R&S®PRM-B1100)		
Interfaces		
Physical connector and input format	for 8 x uncompressed SDTV with ancillary data and up to 16 embedded audio channels	8 x SD-SDI; 75 Ω BNC; 270 Mbit/s; 800 mV (V _{pp}); in line with SMPTE ST 259M-C
	for 8 x uncompressed HDTV up to a resolution of 1080i with ancillary data and up to 16 embedded audio channels	8 x HD-SDI; 75 Ω BNC; 1485 Gbit/s, 1485/1001 Gbit/s; 800 mV (V _{pp}); in line with SMPTE ST 292M
	for 8 x uncompressed HDTV up to a resolution of 1080p, each with ancillary data and up to 16 embedded audio channels or	8 x 3G-SDI; 75 Ω BNC; 2970 Gbit/s, 2970/1001 Gbit/s; 800 mV (V _{pp}); in line with SMPTE 424M with level A or level B dual link (DL)
	for uncompressed 2 x UHD-TV up to a resolution of 2160p via 4 quadrants	
	for compressed video and audio in an MPEG-2 transport stream with ancillary data	8 x ASI; BNC, 75 Ω; 270 Mbit/s; 800 mV (V _{pp}); in line with EN 50083-9
1 Gigabit Ethernet card (R&S®PRM-B600)		
Interface card options	requires 1 slot	4 x 10/100/1000BASE-T via RJ-45 ports
10 Gigabit Ethernet card (R&S®PRM-B610)		
Interface card options	requires 1 slot	2 x ports for SFP+ connections supporting 10GBASE-SR, 10GBASE-LR, and SFP+ copper direct attach physical media; card supplied without SFP modules (For specifications and compatibility of supported SFPs, see R&S®PRISMOMON manual.)
100 Gigabit Ethernet card (R&S®PRM-B630/B640)		
Interface card options	requires 1 slot	1 x/2 x ports for QSFP28 connections supporting 100GBASE-SR, 100GBASE-LR, and QSFP+ copper direct attach physical media; card supplied without QSFP28 modules (For specifications and compatibility of supported QSFP28s, see R&S®PRISMOMON manual.)

Optional output interfaces

Extension graphics card for multiviewer video wall output (R&S®PRM-B300)		
Available video output interfaces		<ul style="list-style-type: none"> 1 × dual-link DVI-D 1 × HDMI™ dual display (HD) capable
USB external sound card (R&S®PRM-B100)		
Concurrent supported audio devices	USB-driven	up to two concurrent audio devices, one for audio preview and one for audio alerts
Output interfaces		1 × 3.5 mm TRS connector port
Static delay		configurable from 1 ms to 10 s in μ s steps

Hardware accessories population rules

Video and Ethernet input cards						
Platform \ Card	R&S® PRM-B1000/ PRM-B1100 (8 × SDI/ASI)	R&S® PRM-B600 (4 × 1 Gbit Ethernet)	R&S® PRM-B610 (2 × 10 Gbit Ethernet)	R&S® PRM-B630 (1 × 100 Gbit Ethernet)	R&S® PRM-B640 (2 × 100 Gbit Ethernet)	Total number of cards / chassis
R&S®PRISMON BASE	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
R&S®PRISMON ULTRA	–	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
R&S®PRISMON PLUS X	≤ 2	≤ 1	≤ 2	≤ 2	≤ 2	≤ 4
R&S®PRISMON PRIME X	≤ 3	≤ 1	≤ 2	≤ 2	≤ 2	≤ 4

Video output card	
Platform \ Card	R&S® PRM-B300
R&S®PRISMON BASE	≤ 1
R&S®PRISMON ULTRA	≤ 1
R&S®PRISMON PLUS X	≤ 2
R&S®PRISMON PRIME X	≤ 2

Audio output card	
Platform \ Card	R&S® PRM-B100
R&S®PRISMON BASE	≤ 2
R&S®PRISMON ULTRA	≤ 2
R&S®PRISMON PLUS X	≤ 2
R&S®PRISMON PRIME X	≤ 2

Optional other components

Second redundant HDD (R&S®BU-Z113)		
Component options	requires 1 HDD bay	operates together with default HDD in software-RAID1 mode

Operating system

Base system		Debian Linux
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Video and audio processing

IP input protocols

Protocols		
IPv4		IETF RFC 791
IGMP v1/v2/v3 multicast		<ul style="list-style-type: none"> IETF RFC 1112 IETF RFC 2236 IETF RFC 3376
UDP		IETF RFC 768
RTP/RTCP		<ul style="list-style-type: none"> IETF RFC 3550 SMPTE ST 2022-1/2 (TS over IP) SMPTE ST 2022-6/7 SMPTE ST 302M
	SMPTE ST 2022 protocol suite (SDI-over IP) ⁵	<ul style="list-style-type: none"> SMPTE ST 2022-6 (video: YCbCr 10 bit, up to 1080p60 level A) SMPTE ST 2022-7
	SMPTE ST 2110 protocol suite	<ul style="list-style-type: none"> SMPTE ST 2110-20 (video: YCbCr-4:2:2 up to 16 bit, up to 2160p60 ⁶, YCbCr-4:4:4 up to 16 bit, up to 1080p60) SMPTE ST 2110-30 (audio: 48 kHz) SMPTE ST 2110-31 (PCM, compressed audio) SMPTE ST 2110-40 SMPTE ST 2022-7 ⁷
	AMWA NMOS protocol suite	<ul style="list-style-type: none"> AMWA NMOS IS-04 v1.3 AMWA NMOS IS-05 v1.1
	OTT protocol suite	HLS, MPEG-DASH, MPEG-CMAF, HDS, Microsoft Smooth Streaming, RTMP, HbbTV, Icecast
NDI [®]		NDI SDK v4.1 (video: YCbCr-4:2:0 8 bit, audio: PCM, 48 kHz)
FEC support		
Pro MPEG FEC COP 3 decoding		SMPTE 2022

Supported IP-based protocols vs. Ethernet interface type

Protocol	OTT suite	SMPTE ST 2022-1/ SMPTE ST 2022-2	SMPTE ST 2022-6	SMPTE ST 2022-7	SMPTE ST 2110- 20/30/31/40	PTP
Hardware interface cards						
1 Gigabit Ethernet built-in	•	•	–	–	–	–
10 Gigabit Ethernet option ⁸	•	•	–	–	–	–
100 Gigabit Ethernet option	•	•	•	•	•	• ⁹
Hypervisor virtual interface cards						
1 Gigabit Ethernet	•	•	–	–	–	–
10 Gigabit Ethernet	•	•	–	–	–	–
100 Gigabit Ethernet	•	•	•	•	•	•

⁵ 3G-SDI level B dual link is not supported.

⁶ Certain configurations may not be supported due to performance limitations of the respective underlying hardware platform.

⁷ Not supported in connection with SMPTE ST 2110-40.

⁸ 10 Gigabit Ethernet interface can be operated only in OTT or SMPTE ST 2022-1/2 mode.

⁹ RTP-PTP offset measurement for SMPTE ST 2110 input.

Baseband SDI protocols

Protocols		
Inputs		<ul style="list-style-type: none"> SD-SDI (SMPTE ST 259) HD-SDI (SMPTE ST 292) 3G-SDI (SMPTE ST 424, 425-1) Quad-link 3G-SDI (SMPTE ST 425-5)
Resolutions	SD-SDI (SMPTE ST 259)	576i50, 486i59.94
	HD-SDI (SMPTE ST 292)	720p50, 720p59.94, 720p60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080i50, 1080i59.94
	3G-SDI level A (SMPTE ST 424), 3G-SDI level B dual-link (SMPTE ST 425-1)	1080p50, 1080p60
	Quad-link 3G-SDI (SMPTE ST 425-5)	2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30, 2160p50, 2160p59.94, 2160p60

Baseband ancillary and VBI data

Audio data		
SD-SDI (SMPTE ST 259)	HANC data	support of 16 AES3 (PCM/non-PCM) channels in line with SMPTE ST 272)
SMPTE ST 2022-6 (SDI-over-IP), HD-SDI (SMPTE ST 292), 3G-SDI (SMPTE ST 424, 425-1), Quad-link 3G-SDI (SMPTE 425-5)	HANC data	support of 16 AES3 (PCM/non-PCM) channels in line with SMPTE ST 299-1)
SMPTE ST 2110-30		<ul style="list-style-type: none"> AES67 payload formats L16 and L24 at 48 kHz sampling rate SMPTE ST 2110-30 conformance levels A and B
SMPTE ST 2110-31		<ul style="list-style-type: none"> AES3 samples as AM824 payload at 48 kHz sampling rate SMPTE ST 2110-31 conformance levels A and B
Ancillary data		
SMPTE ST 2022-6 (SDI-over-IP), SD-SDI (SMPTE ST 259), HD-SDI (SMPTE ST 292), 3G-SDI (SMPTE ST 424, 425-1), Quad-link 3G-SDI (SMPTE ST 425-5) SMPTE ST 2110-40	VANC/HANC data	<ul style="list-style-type: none"> AFD (SMPTE ST 2016-3) payload identifier (SMPTE ST 352) compressed audio metadata (SMPTE ST 2020/SMPTE RDD 6) ANSI/SCTE 104 messages (SMPTE ST 2010) Time Code (SMPTE ST 12-2) VPS (in SMPTE ST 2031) WSS (in SMPTE ST 2031) teletext (in SMPTE ST 2031) closed captions (CEA 708, SMPTE ST 334) teletext subtitles (Free TV OP-47, SMPTE ST 2031) program related metadata in SDI VANC (BBC white paper WHP 296 (revised July 2017))
VBI data		
SD-SDI (SMPTE ST 259)	VBI data	<ul style="list-style-type: none"> WSS (ETSI EN 300294) teletext (ETSI EN 300706) teletext subtitles (ETSI EN 300706) closed captions (CEA 608)

Video decoding and analysis

Video decoding ¹⁰		
Codecs		<ul style="list-style-type: none"> • MPEG-2 main profile, main level (as specified in ETSI TS 101154) • MPEG-2 main profile, high level (as specified in ETSI TS 101154) • MPEG-2 422 profile, up to high level (as specified in ETSI TS 101154) • H.264/AVC (8 bit) high profile at level 4.2 (as specified in ETSI TS 101154) • H.264 high 422 profile (422 8 bit and 10 bit) at level 4.2 (as specified in ETSI TS 101154) • H.265/HEVC main profile/main tier • H.265/HEVC main10 profile (8 bit and 10 bit)/main tier incl. 4:2:0 • J2K • TICO
Resolutions	horizontal x vertical	<ul style="list-style-type: none"> • up to 1920 x 1080 pixel for MPEG-2, H.264, J2K, TICO • up to 3840 x 2160 pixel for HEVC
Frame/field rates		25/29.97/30/50/59.94/60
Operational modes		<ul style="list-style-type: none"> • continuous • periodic thumbnails • round robin (TSoIP and OTT inputs only)
Included additional component decoding		<ul style="list-style-type: none"> • up to 6 audio tracks • up to 6 sub-titles including language icon • 1 teletext • closed captions
Video analysis		
Determination of video frames with no changes (video freeze)		<ul style="list-style-type: none"> • timeout configurable per service • threshold configurable for each YUV component
Determination of video frames with low luminance level (video black)		<ul style="list-style-type: none"> • timeout configurable per service • configurable threshold for the min. expected level of luminance
Determination of lost video signal		timeout configurable per service
Determination of video codec		<ul style="list-style-type: none"> • codec type from set of supported codecs • set-actual comparison for parameters of codec (template monitoring)
Determination of content mismatch	max. delay of content to be compared	60 s

Audio decoding and analysis

Audio decoding		
Codecs		<ul style="list-style-type: none"> • MPEG-1 audio layer II • MPEG-2 audio layer II • AAC • HE-AAC • ATSC A/52 (AC-3) • Dolby Digital™ • Dolby Digital Plus™ • Dolby E™ • VORBIS
Supported channels	depending on codec	mono, stereo, 2.1, 3.1, 4.0, 4.1, 5.0, 5.1, 7.1

¹⁰ MPEG-2 corresponds to H.262/MPEG-2 part 2. H.264 corresponds to MPEG-4 part 10 (AVC).

Supported bit rates	depending on codec in kbit/s	32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 144, 160, 176, 192, 200, 208, 216, 224, 232, 240, 248, 256, 272, 288, 304, 320, 336, 352, 368, 384, 400, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1008, 1024
Supported sampling frequency		48 kHz
Audio analysis		
Determination of audio samples with low audio level (audio silence)		<ul style="list-style-type: none"> • timeout configurable per service • threshold configurable in –0.1 dB steps in relation to the max. level 0 dBFS
Determination of audio samples with high audio level (audio overload)		<ul style="list-style-type: none"> • timeout configurable per service • threshold configurable in –0.1 dB steps in relation to the max. level 0 dBFS
Determination of audio samples with constant audio level (audio constant)		<ul style="list-style-type: none"> • timeout configurable per service • threshold configurable in –0.1 dB steps in relation to the max. level 0 dBFS
Determination of lost audio signal		timeout configurable per service
Determination of audio codec		<ul style="list-style-type: none"> • codec type from set of supported codecs • set-actual comparison for parameters of codec (template monitoring)
Loudness monitoring		<ul style="list-style-type: none"> • in line with EBU R128 and ITU-R BS.1770L • monitoring of: program loudness, short-term loudness, momentary loudness, loudness range and true peak level • based on EIT data events

Data decoding and analysis

Data decoding		
Teletext decoding		<ul style="list-style-type: none"> • DVB teletext (ETSI TS 300472) • EBU teletext (ETSI EN 300706): normal pages, country and network identification (ETSI TS 101231 (2019-04)) • support of subpages
Subtitle decoding		<ul style="list-style-type: none"> • DVB subtitles (ETSI EN 300743) • EBU teletext subtitles (ETSI EN 300706): subtitle pages, country and network identification (ETSI TS 101231 (2019-04))
Determination of lost data signal		timeout configurable per service
Closed caption decoding		visualization (EIA-608 and EIA-708)
Parental rating		status icon and limit monitoring
Running state		status icon
SCTE 35/SCTE 104		logging on trigger
HDR monitoring		<ul style="list-style-type: none"> • status icon • metadata: <ul style="list-style-type: none"> – HDR display primaries X0, Y0, X1, Y1, X2, Y2 – HDR white point X, Y – HDR display mastering luminance min/max – HDR transfer characteristics IDC – color primaries – transfer characteristics VUI – matrix coefficients

Video image quality monitoring

Data decoding		
Referenced-based video quality monitoring methods	max. resolution: UHD/4k	<ul style="list-style-type: none"> • LiveQM: live quality comparison of a signal video stream to a reference video stream having equal resolution and frame rate • PSNR, SSIM and SSIM MOS value for any decoded input signal • side-by-side visualization • A/V delay measurement
Reference-free video quality monitoring methods	resolution: 1080i/p, 720i/p codec: H.264/MPEG-4 AVC	<ul style="list-style-type: none"> • reference-free estimation of PSNR and MOS values for decoded input signal • alarm triggers via settable thresholds for estimated PSNR and MOS values
Number of simultaneously executed quality monitoring engines	max. (only on R&S®PRISMON ULTRA and R&S®PRISMON PRIME X platforms)	<ul style="list-style-type: none"> • 8 simultaneously executed quality monitoring engines up to 1080p60 • 2 simultaneously executed quality monitoring engines up to 2160p60
Delay of reference versus degraded video signal	max.	15 s
Delay of reference versus degraded audio signal	max.	2 s
Export of exact measurement data	CSV export	frame accurate results for last 3600 s

Video content monitoring

Video content compare		
Reference-based picture comparison	max. resolution: HD	content comparison of two video streams possibly having different resolutions and frame rates
Number of simultaneously executed monitoring engines	max.	service count on respective platform
Delay of reference vs. degraded video signal	max.	60 s
Video freeze		
Determination of video frames with no changes (video freeze)	max. resolution: UHD/4k ¹¹	alarm on freeze frame errors
Number of simultaneously executed monitoring engines	max.	service count on respective platform
Video freeze with whitelisting		
Determination of video freeze relative to known good reference images	max. resolution: HD	whitelisting of pre-recorded still images to prevent false alarms for freeze frame errors
Number of simultaneously executed monitoring engines	max.	service count on respective platform
Video black		
Determination of video frames with low luminance level (video black)	max. resolution: UHD/4k	detection of video going to black screen
Number of simultaneously executed monitoring engines	max.	service count on respective platform

¹¹ I-frame distance must be less than 1 s.

OTT source monitoring

Data decoding		
Multiprotocol download	protocols	<ul style="list-style-type: none"> • HLS (HTTP live streaming, draft-pantos-http-live-streaming version 19) • Microsoft Smooth Streaming ([MS-SSTR], rev 6.0, 6/30/2015) • DASH (ISO_IEC_23009-1_2014 – number and time based) • CMAF (ISO/IEC 23000-19:2018) • HDS (Adobe flash video file format specification version 10.1) • RTMP • HbbTV • Icecast
	codecs	<ul style="list-style-type: none"> • HLS: H.264, HEVC, AAC • Microsoft Smooth Streaming: H.264, AAC • DASH: H.264, HEVC, AAC • CMAF: H.264, HEVC, AAC • HDS: H.264 and AAC • RTMP: H.264 and AAC • HbbTV: H.264 and AAC • Icecast: Vorbis, MP3 and AAC
	decryption	<ul style="list-style-type: none"> • DASH: CENC • Microsoft Smooth Streaming, HLS: Microsoft PlayReady™
	subtitles	<ul style="list-style-type: none"> • HLS: WebVTT • DASH: W3C TTML text , SMPTE-TT base64 encoded PNG image • CMAF: W3C TTML text , SMPTE-TT base64 encoded PNG image • Microsoft Smooth Streaming: W3C TTML text, SMPTE-TT base64 encoded PNG image
	digital program insertion	<ul style="list-style-type: none"> • HLS: SCTE 35 (draft-pantos-hls-rfc8216bis-00; subset)
Multiprotocol upload sniffing	protocols	<ul style="list-style-type: none"> • HLS (HTTP live streaming, draft-pantos-http-live-streaming version 19) • DASH (ISO_IEC_23009-1_2014 – number and time based) • CMAF (ISO/IEC 23000-19:2018) • RTMP • Icecast
	codecs	<ul style="list-style-type: none"> • HLS: H.264, HEVC, AAC • DASH: H.264, HEVC, AAC • CMAF: H.264, HEVC, AAC • HDS: H.264 and AAC • RTMP: H.264 and AAC • Icecast: Vorbis, MP3 and AAC
Multiprotocol video-on-demand download		HLS

DVB-T2 source monitoring

Data decoding		
T2-MI decode		<ul style="list-style-type: none"> • extraction of TS from T2-MI data stream • PID selection

Transport layer monitoring

MPEG-TS monitoring

Supported packet size		188 bytes
TR 101290 V1.3.1 (only available with constant bitrate (CBR) transport streams)		
TR 101290 V1.3.1 – first priority		
TS synchronization	2	loss after packets
	7	lock after packets
Sync byte		error
PAT	1 ms to 100 s	upper repetition period
		table ID scrambled
Continuity count		<ul style="list-style-type: none"> discontinuous packet order packet occurs more than twice packet lost
PMT	1 ms to 100 s	upper repetition period
		scrambled
PID distance	1 ms to 100 s	video, upper period
	1 ms to 100 s	audio, upper period
	1 ms to 100 s	data, upper period
TR 101290 V1.3.1 – second priority		
Transport		error indicator
CRC		CRC error in PSI/SI tables: PAT, CAT, PMT, NIT, BAT, SDT, EIT, TOT
PCR discontinuity	1 ms to 100 s	upper limit
PCR repetition	1 ms to 100 s	upper period
PCR jitter	1 ns to 100000 ns	upper limit
	profile	MGF3 (1 Hz)
	test mode	accuracy ¹²
PTS repetition	1 ms to 100 s	upper period
CAT	1 ms to 100 s	missing
		table ID
TR 101290 V1.3.1 – third priority		
SI repetition	1 ms to 100 s	PAT, lower period
	limit is equal to limit of first priority PAT	PAT, upper period
	1 ms to 100 s	CAT, lower period
	1 ms to 100 s	CAT, upper period
	1 ms to 100 s	PMT, lower period
	limit is equal to limit of first priority PMT	PMT, upper period
	1 ms to 100 s	NIT ACTUAL, lower period
	1 ms to 100 s	NIT ACTUAL, upper period
	1 ms to 100 s	NIT OTHER, lower period
	1 ms to 100 s	NIT OTHER, upper period
	1 ms to 100 s	SDT ACTUAL, lower period
	1 ms to 100 s	SDT ACTUAL, upper period
	1 ms to 100 s	SDT OTHER, lower period
	1 ms to 100 s	SDT OTHER, upper period
	1 ms to 100 s	BAT, lower period
	1 ms to 100 s	BAT, upper period
	1 ms to 100 s	EIT ACTUAL PF, lower period
	1 ms to 100 s	EIT ACTUAL PRESENT, upper period
	1 ms to 100 s	EIT ACTUAL FOLLOWING, upper period
	1 ms to 100 s	EIT OTHER PF, lower period
	1 ms to 100 s	EIT OTHER PRESENT, upper period
	1 ms to 100 s	EIT OTHER FOLLOWING, upper period
	1 ms to 100 s	RST, lower period
	1 ms to 100 s	RST, upper period
	1 ms to 100 s	TDT, lower period
	1 ms to 100 s	TDT, upper period
	1 ms to 100 s	TOT, lower period
1 ms to 100 s	TOT, upper period	

¹² Recommended by TR 101290 for monitoring.

SI repetition (cont.)	1 ms to 100 s	AIT, lower period* ¹³
	1 ms to 100 s	AIT, upper period*
NIT ACTUAL	limit is equal to limit of SI repetition	repetition, lower period
	limit is equal to limit of SI repetition	repetition, upper period
		table ID
NIT OTHER	limit is equal to limit of SI repetition	repetition, lower period
	limit is equal to limit of SI repetition	repetition, upper period
SDT ACTUAL	limit is equal to limit of SI repetition	repetition, lower period
	limit is equal to limit of SI repetition	repetition, upper period
		table ID
SDT OTHER	limit is equal to limit of SI repetition	repetition, lower period
	limit is equal to limit of SI repetition	repetition, upper period
EIT ACTUAL	limit is equal to limit of SI repetition	PF repetition, lower period
	limit is equal to limit of SI repetition	present repetition, upper period
	limit is equal to limit of SI repetition	following repetition, upper period
		table ID
EIT OTHER	limit is equal to limit of SI repetition	PF repetition, lower period
	limit is equal to limit of SI repetition	present repetition, upper period
	limit is equal to limit of SI repetition	following repetition, upper period
EIT PRESENT/FOLLOWING		section missing
RST	limit is equal to limit of SI repetition	lower period
	limit is equal to limit of SI repetition	upper period
		table ID
TDT	limit is equal to limit of SI repetition	lower period
	limit is equal to limit of SI repetition	upper period
		table ID
AIT	limit is equal to limit of SI repetition	lower period*
	limit is equal to limit of SI repetition	upper period*
Unreferenced PID	1 ms to 10 s	waiting period after change in PMT or CAT
DVB timing		
Time and date table (TDT)	0 to 10000 s	alarm TDT offset between signaled time and local time
Time offset table (TOT)	0 to 10000 s	alarm TOT offset between signaled time and local time
Digital program insertion		
SCTE 35	protocol	SCTE 35 2017 (subset)
	splice commands	<ul style="list-style-type: none"> splice_null() splice_insert()
	splice time	<ul style="list-style-type: none"> splice_time()
	splice descriptors	<ul style="list-style-type: none"> splice_descriptor() avail_descriptor() DTMF_descriptor() segmentation_descriptor()
Adaptive streaming		
Adaptive Transport streaming	protocol	CableLabs® OC-SP-EBP-I01-130118
Encoding boundary point (ATS-EBP)	error code	<ul style="list-style-type: none"> PMT EBP descriptor missing/invalid PMT scte_adaptation_field_data_descriptor missing private adaptation field invalid EBP invalid/timeout

¹³ Measurements with an asterisk (*) are additional measurements provided on top of TR 101290 V1.3.1 and thus lack a priority class. They were inserted close to related TR 101290 V1.3.1 measurements.

Recording

Incident recording		
Recording instances		10
Maximum parallel recordings		4
Algorithm		event-triggered recording of sliding-window audio/video segments to hard disk
Sliding-window configurable parameters		<ul style="list-style-type: none"> pre-buffer time post-buffer time rearm time
Input	type	<ul style="list-style-type: none"> MPEG-TS OTT
Capture	mode	recording of single input triggered by configurable event type(s)
	trigger	<ul style="list-style-type: none"> manually Boolean logic encoded combination of event types (status, black image, still image)
File format		original container including meta data
File storage		system hard disk

Multiviewer

General capabilities

Design		
Available service tile preset types		<ul style="list-style-type: none"> video, teletext, radio, quality, waveform, status, studio user customizable tile presets storage/retrieval of up to 16 tile presets
Layout		<ul style="list-style-type: none"> each tile freely positionable selectable pre-defined sizes per service tile
Tile modes		<ul style="list-style-type: none"> continuous periodic thumbnails round robin (TSoIP and OTT inputs only)
Number of tiles per screen	max.	72
Number of screens	max.	4
Video visualization		
Aspect ratio handling		<ul style="list-style-type: none"> automatic scaling to correct aspect ratio support of dynamic aspect ratio changes
Audio visualization		
Total number of simultaneously visualized audio tracks		<ul style="list-style-type: none"> up to 6 audio tracks per service tile up to 6 audio channels per audio track
Audio meter scale	total scale	0 dBFS to -55 dBFS
	red area	0 dBFS to -9 dBFS
	yellow area	-9 dBFS to -20 dBFS
	green area	-20 dBFS to -55 dBFS
Peak indicator		<ul style="list-style-type: none"> sample peak program meter decay rate of peak indicator: 12 dB/s
RMS indicator		<ul style="list-style-type: none"> 0 dBFS for full-scale sine wave integration time: 80 ms for 48 kHz
Meta data visualization		
Displayed meta data for tiles		<ul style="list-style-type: none"> EIT present/following data and progress service name aspect ratio codecs video resolution video bit rate video PID audio codec audio language descriptor audio PID subtitle status icon subtitle language descriptor subtitle text teletext status icon parental ration icon running state icon deviation state icon closed caption state icon HDR status icon A/V delay bar A/V delay value OSD error information AIT state icon DSMCC state icon data rate packet loss rate per minute RTP-PTP offset 2022-7 connection status VITC/LTC timecodes

Dynamic system and description tiles		<ul style="list-style-type: none"> up to 10 static text, picture tiles or dynamic text up to 10 clocks up to 10 graphs for displaying bit rates, PSNR or SSIM information up to 16 logbook messages up to 10 counters (increment or decrement)
UMD/tally visualization	protocol	<ul style="list-style-type: none"> TSL UMD protocol (over UDP/IP), version 3.1 and 4.0
	display	<ul style="list-style-type: none"> 2 tallies (colors: none, red, green, amber; 4 luminosity levels) 1 UMD text (up to 8 characters)

HDMI™/DVI output

Resolution		
Frame size/frame rate in frames/s	requires R&S®PRM-B300 extension graphics card	<ul style="list-style-type: none"> mode "HD clone": 1080p25/30/50 identical on HDMI™ and DVI-D interfaces cloned from single multiviewer view mode "HD extended": 1080p25/30/50 separately on HDMI™ and DVI-D interfaces from different multiviewer views mode "UHD": 2160p25 on HDMI™ interface (DVI-D interface disabled)

Streaming output

Transport protocols		
IPv4		IETF RFC 791
UDP		IETF RFC 768
RTP/RTCP		IETF RFC 3550
Output views		
Maximum		4 ¹⁴
Output modes		
TS over IP		
Protocols		SMPTE ST 2022-2 MPEG single program transport stream (SPTS) ISO/IEC 13818-1
Video codecs	MPEG-2	<ul style="list-style-type: none"> MPEG-2 main profile, main level (as specified in ETSI TS 101154) 1 Mbit/s to 15 Mbit/s 576p25/30/50/60
	H.264/AVC	<ul style="list-style-type: none"> H.264/AVC (as specified in ETSI TS 101154) 1 Mbit/s to 15 Mbit/s 576p25/30 720p25/30 1080p25/30/50/60
Audio codecs	MP2	<ul style="list-style-type: none"> up to 2 channels per view (stereo downmix) 48 kHz
SDI over IP		
Protocols		SMPTE ST 2022-6, SMPTE ST 2022-7
Video codecs	uncompressed	<ul style="list-style-type: none"> 1080p25/30/50 YCbCr-4:2:2 10 bit
Audio codecs	uncompressed	<ul style="list-style-type: none"> up to 2 channels per view (stereo downmix) 48 kHz linear PCM, 24 bit (SMPTE ST 299-1)

¹⁴ Depending on platform choice and actual system load.

SMPTE ST 2110		
Protocols		SMPTE ST 2110-20, SMPTE ST 2110-21 (type W), SMPTE ST 2022-7, SMPTE ST 2110-30
Video codecs	uncompressed	<ul style="list-style-type: none"> • 1080p25/30/50/60 • 2160p25/30 • YCbCr-4:2:2 10 bit, PTP sampled
Audio codecs	uncompressed	<ul style="list-style-type: none"> • up to 2 channels per view (stereo downmix) • 48 kHz, 24 bit
OTT		
Protocols		HLS, MPEG-DASH, MPEG-CMAF, HDS, Microsoft Smooth Streaming, RTMP
Video codecs	H.264	<ul style="list-style-type: none"> • 240p25 • 576p25 • 720p25 • 1080p25
Audio codecs	audio not supported	

Operation and management

Application HMI

Web-based user interface		
Browser support	supported web browser	<ul style="list-style-type: none"> Firefox 49 or higher Chrome 51 or higher
	recommended screen resolution	1280 × 720 pixel or higher
Logbook	number of stored messages	up to 10 000 messages
	export format	CSV export

Application monitoring and notification

SNMP support		
SNMP GET		SNMP v2c (IETF RFC 1441 and following)
SNMP TRAP		<ul style="list-style-type: none"> SNMP v2c (IETF RFC 1441 and following) up to three trap sinks
SMTP support		
Email notification	send alert and alarm information via email to named recipients	RFC 2821
MQTT support		
Client mode	push monitoring values to broker	MQTT v3.1 (v3.1.1 client library)

System management

Base system		
Remote device monitoring		SNMP v1, v2c (IETF RFC 1441 and following)
Remote maintenance		<ul style="list-style-type: none"> web: configuration of services and software upgrades remote control and automation API
Time synchronization		
NTP		NTP v3 (RFC 1305)
PTP ¹⁵		<ul style="list-style-type: none"> IEEE 1588-2008 in the role of end station RTP-PTP offset measurement for SMPTE ST 2110 input Hybrid end-to-end mode configurable parameters: <ul style="list-style-type: none"> PTP domain (max. 4) delay DSCP event message DSCP general message hybrid delay mechanism
Software		
Configuration and version management		<ul style="list-style-type: none"> import/export system configuration to file software field-upgradeable via web UI support of dual software images (only with hardware-based deployment)
License management		<ul style="list-style-type: none"> via license server (deployment: co-located or standalone) support of floating licenses (dynamic sharing of licenses between instances of system)
Interoperability		
Discovery and registration		<ul style="list-style-type: none"> AMWA NMOS IS-04 v1.3
Device connection management		<ul style="list-style-type: none"> AMWA NMOS IS-05 v1.1

¹⁵ PTP only available with 100 Gigabit Ethernet card (R&S®PRM-B630/640) installed.

Virtualization/cloud hypervisor support

Compatibility		
VMware	VMware ESXi 6.7	provision as OVF image
KVM	KVM on Ubuntu 16.04 LTS	provision as QEMU image

Ordering information

Designation	Type	Order No.
System		
R&S®PRISMON system	R&S®PRM-SYSTEM	2119.7140K02
Hardware and options		
Hardware platform base unit		
R&S®PRISMON BASE base unit	R&S®PRM-BU110	2119.6989.02
R&S®PRISMON ULTRA base unit	R&S®PRM-BU140	2119.7010.02
R&S®PRISMON PLUS X base unit	R&S®PRM-BU220	2119.7040.02
R&S®PRISMON PRIME X base unit	R&S®PRM-BU230	2119.7056.02
Front panel R&S®PRM-BU1XX generation 2	R&S®BU-ZFP1	2119.7404.02
Front panel R&S®PRM-BU2XX generation 2	R&S®BU-ZFP2	2119.7410.02
Hardware accessories		
Graphics card		
Extension graphics card for VideoWall output	R&S®PRM-B300	2119.7633.02
I/O cards		
PRIOS-M SDI/ASI broadcast input card	R&S®PRM-B1000	2119.7740.02
8 x SDI/ASI BNC interface breakout box for PRIOS-M input card	R&S®PRM-B1100	2119.7756.02
Electrical dual 3G-SDI/ASI video SFP (emSFP) receiver module for PRIOS-M input card	R&S®AVS-B1200	3622.0989.02
USB external sound card	R&S®PRM-B100	2119.7591.02
4 x 1 Gigabit Ethernet card	R&S®PRM-B600	2119.7656.02
2 x 10 Gigabit Ethernet card (without SFP modules)	R&S®PRM-B610	2119.7640.02
1 x 100 Gigabit Ethernet card (without QSFP28 modules)	R&S®PRM-B630	2119.7579.02
2 x 100 Gigabit Ethernet card (without QSFP28 modules)	R&S®PRM-B640	2119.7585.02
Mounting components		
Base unit (1 RU) rackmount rail kit (Dell)	R&S®BU-Z707	2119.7679.02
Base unit X (2 RU) rackmount rail kit (Dell)	R&S®BU-Z708	2119.7685.02
Secondary power supplies		
Second redundant power supply for R&S®PRM-BU110	R&S®BU-Z110	2119.7704.02
Second redundant power supply for R&S®PRM-BU140	R&S®BU-Z112	2119.7727.02
Second redundant power supply for R&S®PRM-BU220/230	R&S®BU-Z111	2119.7710.02
Secondary hard disks		
Second redundant HDD for R&S®PRM-BU110/140/220/230	R&S®BU-Z113	2119.9559.02
Second redundant HDD for R&S®PRM-BU1xx/2xx generation 2	R&S®BU-Z213	2119.9571.02
Software and options		
System software dongle		
R&S®PRISMON system license dongle	R&S®PRM-DONGLE	2119.7110.02
Core software license		
R&S®PRISMON software instance – extended core license	R&S®PRM-KXCORE	2119.8681.02
Input – source signal types and basic monitoring		
Broadcast IP source – instance license	R&S®PRM-KBIPS	2119.8698.02
OTT source – instance license	R&S®PRM-KOTTS	2119.8700.02
SDI/ASI – instance license	R&S®PRM-KSDIS	2119.8717.02
Extended source signal monitoring and analysis		
Extended source signal monitoring and analysis – instance license	R&S®PRM-KEXSM	2119.8723.02
Processing – service decoding and basic analysis		
Video-thumbnail/pure-audio decoder and analysis – instance license	R&S®PRM-KVTAD	2119.8730.02
Video decoding and continuous analysis – single license	R&S®PRM-KSVDC	2119.8746.02
Extended service decoding		
TICO decoder – single license (1 stream)	R&S®PRM-KTICOS	2119.8475.02
TICO decoder – bulk license (4 streams)	R&S®PRM-KTICOB	2119.8481.02
Advanced service analysis		
Video freeze whitelisting – instance license	R&S®PRM-KVFWL	2119.8517.02
Video live quality measurement (LiveQM) – instance license	R&S®PRM-KVLQM	2119.8523.02
Video content compare – instance license	R&S®PRM-KVCC	2119.8530.02
Incident recording – instance license	R&S®PRM-KIREC	2119.8669.02
Output – multiviewer formats		
VideoWall: multiviewer mosaic view output – single license	R&S®PRM-KVWMMO	2119.8752.02

Designation	Type	Order No.
Virtualization/cloud options		
Hypervisor image		
R&S®PRISMON hypervisor image for VMware	R&S®PRM-KHVVM	2119.8800.02
R&S®PRISMON hypervisor image for KVM	R&S®PRM-KHVKVM	2119.8852.02

Option identification: R&S®PRM-Bxy = hardware option, R&S®PRM-Kxy = software option.

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