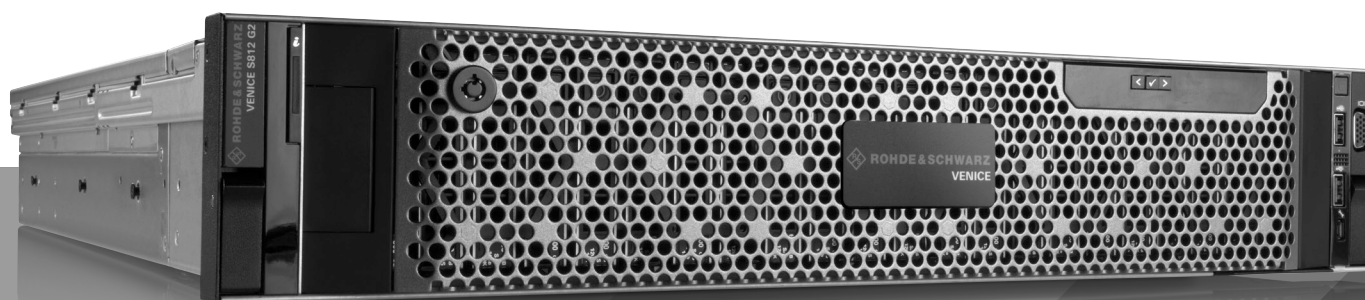


R&S® VENICE S

Specifications



Data Sheet
Version 08.00

ROHDE & SCHWARZ

Make ideas real



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Definitions

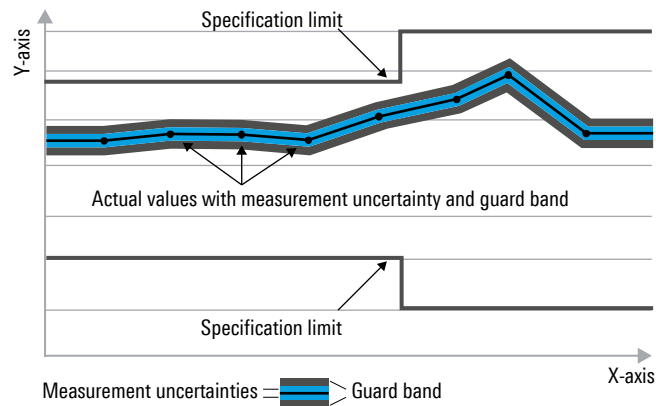
General

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.

Key features

R&S[®]VENICE is an ingest and studio playout platform that enables broadcasters to deliver content in the most appropriate manner by merging SDI and video-over-IP technologies, empowering the user to migrate to IP based production at a time and pace that best suits their situation. It provides a single platform covering live production, studio production and channel playout applications. It can be flexibly adapted to user requirements thanks to its software architecture and scalability. R&S[®]VENICE has a new server core, which is paired with commercial off-the-shelf hardware and a video I/O board designed by Rohde & Schwarz. This board allows R&S[®]VENICE to interface with traditional SDI infrastructures and be ready for upcoming IP technologies. The user controls the pace of the transition from SDI to IP.

- On-air reliability:
The entire system has no single point of failure thanks to the redundancy of every system-relevant component
- Hybrid SDI/IP functionality:
Switch from SDI to IP (ST 2110) by simply exchanging the SFP+ modules
- Scalability:
Scales to meet user requirements, no matter how many channels and how much storage capacity and bandwidth are needed
- UHD and HDR-ready:
Supports UHD material up to p60; supports Rec. 709 and Rec. 2020, allowing for high-quality HDR productions
- High channel density:
Up to 2 UHD p60 channels or up to 8 HD p60 channels in just 2 HU
- Comprehensive software based codec support
- Interoperability:
Highly interoperable, support for various communications protocols such as VDCP, FIMS, MOS
- Storage options:
Can be equipped with up to 24 Tbyte internal RAID storage and natively integrates into spectrum scale infrastructures

Specifications

System configuration	<ul style="list-style-type: none"> • 2 HU rackmount server chassis • up to 22 front-mounted, hot-swappable media hard disk drives • 1+1 redundant front-mounted, hot-swappable operating system hard disk drives • 1+1 redundant hot-swappable power supplies (100 V to 240 V AC) • 2 Intel Xeon™ 12-core processors (R&S®VENICE-S4XX models) • 2 AMD EPYC™ 24-core processors (R&S®VENICE-S8XX models) • up to 128 Gbyte DDR4 RAM • 2 × 1 Gbit Ethernet ports • 2 × 10 Gbit Ethernet ports • 2 × USB 3.0 ports (rear) • 2 × USB 2.0 ports (front) • Linux operating system
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Video I/O formats

SDI 270 Mbit/s		
SMPTE 259M	525i	29.97 fps
SMPTE 259M	625i	25 fps
SDI 1.5G single link		
SMPTE 274M	1080i, 1080p, 1080PsF	25 fps, 29.97 fps
SMPTE 296M	720p	25 fps, 29.97 fps, 50 fps, 59.94 fps
SDI 3G single link (level A or B)		
SMPTE 425	1080p	50 fps, 59.94 fps
SDI 6G quad link, 4 × 1.5G SDI		
SMPTE 2036	2160p (optional)	25 fps, 29.97 fps
SDI 12G quad link (level A or B), 4 × 3G SDI (SQD and 2SI)		
SMPTE 2036	2160p (optional)	50 fps, 59.94 fps
SDI 12G single link, 1 × 12G SDI		
SMPTE 2082	2160p (optional)	50 fps, 59.94 fps
10 Gbit/s Ethernet		
SMPTE 2110	720p	50 fps, 59.94 fps
	1080i, 1080p	25 fps, 29.97 fps
	1080p	50 fps, 59.94 fps
	2160p (optional)	50 fps

Channel configurations

R&S®VENICE can be set to HD/SD or UHD-1 operation.

HD, SD	<ul style="list-style-type: none"> • 4 ×/8 × bidirectional HD/SD channels • optional transform functionality per channel • automatic aspect ratio conversion (ARC) with active format descriptor (AFD) support (VDCP playout mode)
UHD-1 (optional)	<ul style="list-style-type: none"> • 1 ×/2 × bidirectional UHD-1 channels • optional transform functionality • 1 ×/2 × HD downconversion output channels (locked to UHD-1 channel)

Connectivity (inputs and outputs)

HD/SDI	video inputs/outputs	4 x/8 x SFP+ slots with 4 x/8 x 3G high-density BNC (HD-BNC) connectors on 2 x/4 x 3G-SDI dual receivers (optional)
		4 x/8 x 3G HD-BNC connectors on 2 x/4 x 3G-SDI dual transmitters (optional)
		1 x/2 x 12G HD-BNC connectors on 1 x/2 x 12G-SDI dual receivers (optional)
		1 x/2 x 12G HD-BNC connectors on 1 x/2 x 12G-SDI dual transmitters (optional)
HD/SDI down conversion	video output	1 x/2 x 3G HD-BNC
ST 2110	Video inputs/outputs	4 x/8 x SFP+ slots with 4 x/8 x 10 Gbit Ethernet transceivers (optional)
Genlock	reference sync input	bilevel, trilevel with dedicated HD-BNC connector
RS-422 serial control		4 x/8 x RJ-45
LTC	input/output	high-density D-Sub 26 connector (1 LTC input and 1 LTC output per channel with optional breakout cable)
10 Gbit Ethernet network		2 x SFP+ ports with SFP SR for 10 Gbit Ethernet
1 Gbit Ethernet network		2 x RJ-45

Audio

Input	per video channel	8 pairs (16 channels), embedded
Output	per video channel	8 pairs (16 channels), embedded
Sample precision		16 bit, 24 bit or 32 bit PCM, 48 kHz
Compressed audio pass-through		Dolby E™

Formats and codecs

SD		IMX30/40/50, DV25, DVCPro25, DVCPro50, Apple ProRes LT/422/HQ
HD 1080p/720p		DVCPro100, XDCAM HD (RDD09), Avid DNxHD, AVC-Intra50, AVC-Intra100, AVC-Intra200, XAVC, Apple ProRes LT/422/HQ
UHD-1		XAVC Intra Class 300, Avid DNxHR HQ/LB/SQ, Apple ProRes Proxy/LT/422/HQ
Proxy generation	HD/SD	
	encoded frame size	640 × 360 pixel, 640 × 480 pixel
	video encoding	MPEG-2, MPEG-4 (MP4, MXF)
	UHD-1	
	encoded frame size	1920 × 1080 pixel
	video encoding	Apple ProRes Proxy/LT/422/HQ (MOV)

For a comprehensive list of codecs, refer to the supported file formats document for R&S®VENICE S software, version 4.3 or newer.

Aspect ratio

SD		16:9, 4:3
HD, UHD-1		16:9
Aspect ratio conversion		in HD/SD playout and transform mode
AFD support ¹	standard (read)	WSS, SMPTE 2016
	standard (write)	SMPTE 2016
	override	insert/fill/override embedded AFD metadata on a per-channel basis

Closed captions and subtitles

Closed caption formats	file insertion, pass through and generation	scenarist closed caption (SCC)
	standards	EIA-608/708
	up/down/cross conversion ¹	<ul style="list-style-type: none"> support for NTSC EIA-608 to/from EIA-708 conversion support for line 21 to EIA-608/708 conversion
Subtitle formats	file insertion, pass through and generation	STL: world standard teletext (WST) subtitles
	standards	WST, OP-42, OP-47
	up/down conversion ¹	support for PAL WST, OP42 to OP47 conversion

Timecode

Timecode	LTC	balanced analog I/O per channel
	HD/SDI: HD HANC/VANC	read, generate and write discontinuous ATC/LTC, ATC/VITC1 and ATC/VITC2
	HD/SDI: SD VBI	read discontinuous VITC1 and VITC2

¹ Requires R&S®VENICE software, version 4.0 or higher.

Image processing

Proxy generation	video encoding	ProRes Proxy/LT/422/HQ, MPEG-2, MPEG-4
	HD/SD encoded frame size	640 x 360 pixel, 640 x 480 pixel
	UHD-1 encoded frame size	1920 x 1080 pixel
UHD-1 to HD downconversion		parallel HD-SDI output

Protocols, file interchange and file ingest

Protocols		
TCP/IP	video disk control protocol (VDCP)	
RS-422 serial		
TCP/IP	FIMS capture	
TCP/IP	FIMS transform	
TCP/IP	MOS 3.8	
TCP/IP	simple network management protocol (SNMP)	
TCP/IP	NMOS IS-04 based discovery and registration	
TCP/IP	NMOS IS-05 based device connection management	
UDP	SMPTE 2110-20 based transport of professional video over an IP network	
UDP	SMPTE 2110-30 based transport of professional audio over an IP network	
UDP	SMPTE 2110-40 based transport of professional ancillary data over an IP network	
ST 2022-7:2019	section 6: creation of streams for seamless reconstruction	fully supported
	section 7: reception of streams for seamless reconstruction	<p>receivers support:</p> <ul style="list-style-type: none"> video, class A: low skew (< 10 ms) audio, class B: moderate skew (< 50 ms) for level A <p>Note that the audio and ANC senders are implemented in software. The path difference of the transmitted primary and secondary stream can therefore be several milliseconds. Audio and ANC receivers connected to this sender should therefore support at least class A: low skew (< 10 ms) or, better, class B: moderate skew (< 50 ms).</p>
ST 2110-10:2022	section 6.1: general requirements	only IPv4
	section 6.2: real-time transport protocol (RTP)	supported
	section 6.3: standard UDP size limit	supported
	section 6.4: extended UDP size limit	not supported
	section 6.5: unicast and multicast	only IPv4 multicast transmission and reception
	section 7: system timing model	<ul style="list-style-type: none"> a common reference clock shall be provided and distributed on the network by means of IEEE 1588-2008 precision time protocol (PTP) the reference clock shall conform to SMPTE 2059-1 and SMPTE 2059-2 R&S®VENICE does not support PTP master mode; the media clock and the PTP clock must always be synchronized with the reference clock the RTP timestamps are compliant to section 7.6.1, 7.6.3, 7.7.1 and 7.7.3 currently not fully understood and tested are the sections 7.8 link offset delay <p>Video, audio and ANC delay considerations:</p> <p>The receiver requires an RTP video timestamp delay (RTP offset) of less than X frames. Audio, ANC and video streams of one R&S®VENICE channel are synchronized by comparing the RTP timestamps. Thus, the video, audio and ANC timestamps shall represent the same sampling instance. The received audio, ANC and video packets of the same sampling instance (same RTP timestamp) shall not be offset against the reference clock by more than X milliseconds.</p>

ST 2110-10:2022 (continued)	section 8: session description protocol (SDP)	supported except section: <ul style="list-style-type: none"> section 8.2: timestamp reference clock signaling: <ul style="list-style-type: none"> audio and video senders signal the reference clock via "ts-refclk:ptp" and the grandmaster ID the receivers assume that all streams are synchronized to the same reference clock section 8.3: media clock signaling: R&S®VENICE receivers do not support "a=mediack:sender" section 8.6: UDP datagram size section 8.7: RTP timestamp mode and delay <ul style="list-style-type: none"> TSMODE and TSDelay are not set in sender SDP files and ignored by the receivers
ST 2110-20:2022	section 6: uncompressed active video RTP essence format	<ul style="list-style-type: none"> R&S®VENICE senders and receivers only support the video sampling format: YCbCr-4:2:2 at 10 bit the sender will pack the headers and payloads conform to the general packing mode (GPM) the receiver supports section 6.3.3: block packing mode (BPM) a limitation of the PriosBC hardware is that a 2110-20 (video) multicast stream that is received on any of the PriosBC network ports can only be routed to a single R&S®VENICE channel
	section 7: session description protocol (SDP) considerations	<ul style="list-style-type: none"> full compatibility with SDP files describing the supported video sampling format: YCbCr 4:2:2 at 10 bit receivers ignore the following SDP parameters: <ul style="list-style-type: none"> MAXUDP RANGE PAR
ST 2110-21:2022	section 7.1: senders	the video senders are always section 7.1.2: narrow senders (type N) defined in section 6.3: gapped packet read schedule (PRS)
	section 7.2: receivers	R&S®VENICE can receive these types of video streams: <ul style="list-style-type: none"> 7.2.3 narrow, synchronous receivers (type N) 7.2.4 wide, synchronous receivers (type W)
	Section 8.1: required parameters	<ul style="list-style-type: none"> only the TP parameter is evaluated TROFF and CMAX are ignored
ST 2110-30:2017	section 6.1: media clock, RTP clock and RTP timestamps	<ul style="list-style-type: none"> the media clock and the PTP clock must always be synchronized with the reference clock only a sample rate of 48 kHz is supported timestamps are set in line with ST 2110-10
	section 6.2.1: general provisions	<ul style="list-style-type: none"> Rohde & Schwarz supports the standard for 48 kHz at 24 bit for up to 8 channels with a packet timing of 1 ms extended UDP size from ST 2110-10 is not supported
	section 6.2.2: channel order convention	<ul style="list-style-type: none"> not supported by sender and receivers receivers will ignore the channel order parameters in the SDP file
	section 7: conformance levels	<ul style="list-style-type: none"> senders are only compliant with conformance level A receivers are compliant with conformance level A receivers could be compliant with conformance level B (implementation needed)
AES67-2013	section 7.5: sender timing and receiver buffering	<p>due to the software implementation of the audio sender, an ST 2110-30 sender only supports the following packet timing constraints:</p> <ul style="list-style-type: none"> senders shall transmit data at the nominal transmission time with a variation of no more than 17 packet times or 17 ms, whichever is smaller as a result, a transmission time variation of 1 ms cannot be ensured
ST 2110-40:2023	section 5.2: RTP payload format	supported
	section 6: timing model	<ul style="list-style-type: none"> the sender sends the ANC packets synchronous to the ST 2110-20 video packets. The ANC packets transmit time is scheduled directly after the beginning of the frame. Therefore, ANC packets are provided in the video gap. the ANC sender shall conform to section 6.5: compatible transmission model (CTM) the ANC receiver can receive section 6.5: compatible transmission model (CTM) and 6.4 low-latency transmission model (LLTM) streams the section 6.2: definition of time offsets and section 6.3: frame and field start times are not considered in our implementation, since the implementation was done for an earlier version of the ST 2110-40:2018 standard where these timing constraints were not mentioned
	section 7: session description protocol (SDP)	the SDP file of the sender does not provide the parameters SSN, TM, exactframerate and TROFF; a receiver should use the default values and the frame rate from the video stream

AMWA NMOS IS-04		<ul style="list-style-type: none"> supported versions: 1.0, 1.1 and 1.2 the NMOS IS-04 discovery supports multicast and unicast DNS-SD, direct configuration of the registration server address and peer-to-peer mode as fallback
AMWA NMOS IS-05		supported version: 1.0
File interchange		
FTP	active and passive	the SDP file of the sender does not provide the parameters SSN, TM, exactframerate and TROFF; a receiver should use the default values and the frame rate from the video stream
SMB	FTP, FXP	

General data (R&S®VENICE-S4xx models)

Environmental conditions		
Temperature	operating temperature range	+10 °C to +35 °C
	storage temperature range	−40 °C to +65 °C
Relative humidity	operating	10 % to 80 % relative humidity with +29 °C maximum dew point
	storage	5 % to 95 % relative humidity with +33 °C maximum dew point; atmosphere must be noncondensing at all times
Power rating		
Rated voltage		100 V to 240 V AC
Rated frequency		50 Hz/60 Hz
Power output	maximum	1100 W (100 V to 240 V AC)
	average	414 W (100 V to 120 V AC, 60 Hz) 397 W (200 V to 240 V AC, 50 Hz)
BTU	maximum	4100 BTU/h
	average	1413 BTU/h, 414 W (100 V to 120 V AC, 60 Hz) 1355 BTU/h, 397 W (200 V to 240 V AC, 50 Hz)
Product conformity		
CE marking		in line with the following directives: <ul style="list-style-type: none"> • 2014/30/EU • 2014/35/EU • 2011/65/EU • 2009/125/EC
FCC rating		class A
UL		in line with the following standards: <ul style="list-style-type: none"> • UL 60950-1, second edition, 2011-12-19 • CSA C22.2 No. 60950-1-07, second edition, 2011-12
Dimensions and weight		
Dimensions	W × H × D	482 mm × 87.3 mm × 755.8 mm (18.98 in × 3.44 in × 29.76 in)
Weight	with drives	max. 31.4 kg (69.23 lb)

General data (R&S®VENICE-S8xx models)

Environmental conditions		
Temperature	operating temperature range	+10 °C to +35 °C
	storage temperature range	−40 °C to +65 °C
Relative humidity	operating	10 % to 80 % relative humidity with +29 °C maximum dew point
	storage	5 % to 95 % relative humidity with +33 °C maximum dew point; atmosphere must be noncondensing at all times
Power rating		
Rated voltage		100 V to 240 V AC
Rated frequency		50 Hz/60 Hz
Power output	maximum	1100 W (100 V to 240 V AC)
	average	414 W (100 V to 120 V AC, 60 Hz) 397 W (200 V to 240 V AC, 50 Hz)
BTU	maximum	4100 BTU/h
	average	1413 BTU/h at 414 W (100 V to 120 V AC, 60 Hz) 1355 BTU/h at 397 W (200 V to 240 V AC, 50 Hz)
Product conformity		
CE marking		in line with the following directives: <ul style="list-style-type: none"> • 2014/30/EU • 2014/35/EU • 2011/65/EU • 2009/125/EC
FCC rating		class A
UL		in line with the following standards: <ul style="list-style-type: none"> • UL 60950-1, second edition, 2011-12-19 • CSA C22.2 No. 60950-1-07, second edition, 2011-12
Dimensions and weight		
Dimensions	W × H × D	482 mm × 86.8 mm × 751.5 mm (18.98 in × 3.44 in × 29.59 in)
Weight	with drives	max. 33.4 kg (73.63 lb)

Rack support

Rackmounting		
Rails		<ul style="list-style-type: none"> • sliding rails for tool-less mounting in 4-post racks with square or unthreaded round holes or • tool-less mounting in 4-post threaded hole racks, with support for tool-less cable management arm
Cable management		tool-less cable management arm included

Ordering information

Your local Rohde & Schwarz expert will help find the best solution for you.
Contact your local Rohde & Schwarz sales office for more information, www.sales.rohde-schwarz.com

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- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

Rohde & Schwarz

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Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

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