R&S®VENICE S800/812/824-G2
User Manual

ROHDE&SCHWARZ

Make ideas real

Contents

General

This chapter includes the following section:

- "About this Documentation" (page 8)

About this Documentation

This documentation informs you about the installation of the VENICE S hardware, a video server system by Rohde & Schwarz, its operation as well as all connection possibilities. Furthermore, it describes maintenance tasks that you may carry out on your own.

Required Reading

Each person who is responsible for installation, operation, maintenance or setting of the system has to read and understand this manual.

Target Group

To use this manual you should have experience in handling video and computer equipment.

When performing maintenance tasks on the hardware, you must be qualified to work on, repair and test electrical equipment.

Additional Documentation

Following documents have to be heeded while working with VENICE S:
- Data Sheet
- Safety, Environment and Regulatory Information
- Software Integration Guide
- Supported File Formats for Software Version 3.5
- Supported File Formats for Software Version 4

The complete documentation can be downloaded from **https://gloris.rohde-schwarz.com** after registering/logging in to access restricted information. There you may find updated manuals and further information as well.

Safety

This chapter is divided into the following sections:

- "For your Safety" (page 10)
- "General Notes" (page 11)

For your Safety

The product documentation helps you to use VENICE S safely and efficiently. Keep the product documentation in a safe place and pass it on to the subsequent users. Use VENICE S only in its designated purpose as described in the product documentation. Observe the performance limits and operating conditions stated in the specification (data sheet).

Safety information is part of the product documentation. It warns you about the potential dangers and gives instructions how to prevent personal injury or damage caused by dangerous situations.

Safety information is provided as follows:

- In the "Basic Safety Instructions", safety issues are grouped according to subjects.
- Throughout the documentation, safety instructions are provided when you must pay attention during setup or operation.

Always read the safety instructions carefully. Make sure to fully comply with them. Do not take risks and do not underestimate the potential danger of small details such as a damaged power cable.

General Notes

Please observe the following general important notes:

- Computer hardware contains components that are sensitive to electro-static discharge. If you touch them without precautionary measures, they can be destroyed. Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the system. Avoid touching the internal components of VENICE S whenever possible.

- Performance Loss:
  VENICE S has been delivered to you fully preconfigured and optimized for a real-time in- and output of video streams. Changing any of the settings (e.g. the hardware, software and/or BIOS settings) may lead to a loss of performance or may even render the system unusable. Re-configuring VENICE S anew in most cases is a lengthy procedure. Modi-fications of settings i.e. BIOS settings shall be done with Rohde & Schwarz.

- Third-party Software:
  VENICE is built for the most demanding realtime operations. Third-party software might have unpredictable influences to the overall performanc and stability of the system. Do not install any third-party software that has not been tested and approved by Rohde & Schwarz on your system.

- Real-time performance:
  Use only the optional internal storage or external storage solutions which are tested and released by Rohde & Schwarz to store video and audio data. Other storage locations and solutions will be too slow for real-time operations.

- Storage capacity exceeded:
  In case of a full storage performance losses may occur. Leave about 10 to 15 % of the overall main storage capacity empty of data for perfor-mance reasons.

- It is recommended to set up an e-mail notification, to ensure you get informed when a hardware malfunction occurs.

Product Description

This chapter is divided into the following sections:

- "Function" (page 14)
- "Models" (page 15)
- "Features" (page 16)
- "Type Plate and Serial Number" (page 27)
- "Scope of Delivery" (page 29)
- "The Front of the System" (page 30)
- "The Rear of the System" (page 34)
- "Inside the System" (page 45)
- "Pin Assignment" (page 49)
- "Network Ports" (page 55)

Function

VENICE S is a media server especially designed for studio production as well as channel playout. It offers ingest, playout and transforming functions in one single box. The open software structure allows to combine video and IT workflows in broadcast environments.

In playout mode VENICE S assumes the role of a player. For a remote controlled playout set VENICE S in VDCP or MOS mode via VENICE web service or the R&S®Device Manager.

In ingest mode VENICE S assumes the role of a recorder. For a remote controlled ingest set VENICE S in FIMS or VDCP mode via VENICE web service or the R&S®Device Manager.

In transform mode VENICE S transforms video and audio material to different file formats. If possible, the file conversion (transcoding) will be performed in hardware at a faster render speed. For a remote controlled transform set VENICE S in FIMS mode via VENICE web service or the R&S®Device Manager.

For more information about the integration of VENICE S by VDCP, MOS, FIMS and the VENICE web service please see the Software Integration Guide, available at:
https://gloris.rohde-schwarz.com.

There's no graphical Desktop on the VENICE-S, so you got to talk to it via either:

- text console on locally connected monitor and keyboard (front or rear connectors)
- remote SSH console („Putty" or „MobaX" on Windows PC or laptop)
- remote R&S®Device Manager (via browser on Windows PC or laptop)

Models

The following models are available:

- VENICE S800 (no internal media storage)
- VENICE S812 (12 TB internal media storage)
- VENICE S824 (24 TB internal media storage)

Features

- **On-air reliability:** The entire system has no single point of failure due to the redundancy of every system-relevant component.
- **SDI and IP functionality:** Equipped with a new video I/O board, VENICE S offers SDI and IP functionality.
- **Flexible system design:** VENICE S can be scaled to meet your requirements, no matter how many channels and how much storage capacity or bandwidth you need.
- **UHD and HDR ready:** VENICE S supports up to two UHD p60 channel (bidirectional) and eight HD p60 channels (bidirectional) and handles HDR material with ease.
- **Standard server platform:** VENICE S uses a standard IT server whose reliability and performance has proven itself a thousand times over in data centers worldwide.
- **Comprehensive software-based codec support:** VENICE S minimizes the need for transcoding by supporting a variety of software-based codecs that can be expanded via future software updates.
- **Service-oriented architecture:** FIMS and web services communications allow the greatest possible interoperability, flexibility and integrability in the broadcast value chain. VENICE S is easy to integrate into existing infrastructures and can be dynamically adapted to meet any requirement.
- **Storage options:** VENICE S can be equipped with up to 24 terabyte internal RAID storage and connected to external storage solutions.

Channel Configuration

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

HD/SD:
- eight bidirectional HD/SD channels
- optional transform functionality per channel
- automatic aspect ratio conversion (ARC) with active format descriptor (AFD) support

UHD:
- two bidirectional UHD-1 channel
- optional transform functionality
- one HD downconversion output per channel (locked to UHD-1 channel)

Workflow-based Metadata

VENICE S enables you to use the process of closed captioning (CC) and subtitling (STL), so that it can be decoded and displayed on a television, video screen, or other visual displays.

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VBI-ANC Handling

VENICE S supports the read out of VBI (vertical blanking interval) information. VBI information will be converted to ANC on any output raster.

INPUT		PLAYOUT	OUTPUT	
ANC & VBI Closed Caption			**ANC Closed Caption**	
SD-SDI V-Lines: 525	VBI CEA-608 data ANC CEA-608 data ANC & VBI CEA-608 data[1]	→	SD-SDI V-Lines: 625	ANC CEA-608 data (SMPTE 334-1)
		→	HD-SDI	ANC Closed captioning (CEA-708) (CDP) (SMPTE 334-1)
HD-SDI	ANC Closed captioning (CEA-708) (CDP) ANC CEA-608 data	→	SD-SDI V-Lines: 625	ANC CEA-608 data (SMPTE 334-1)
		→	HD-SDI	ANC Closed captioning (CEA-708) (CDP) (SMPTE 334-1)

1.particular case

INPUT		PLAYOUT	OUTPUT	
ANC & VBI Closed Caption			**ANC Closed Caption**	
SD-SDI V-Lines: 625	VBI OP-42 ANC OP-47 ANC & VBI OP-47/42[1]	→	SD-SDI V-Lines: 625	ANC OP-47 (SMPTE 2031)
		→	HD-SDI	ANC OP-47 (SMPTE 2031)
HD-SDI	ANC OP-47	→	SD-SDI V-Lines: 625	ANC OP-47 (SMPTE 2031)
		→	HD-SDI	ANC OP-47 (SMPTE 2031)

1.particular case

The following VBI information will be converted to ANC:

VBI		ANC (SMPTE 291)
WSS (Wide Screen Signaling, ETSI EN 300 294)	→	AFD (Active Format Description, SMPTE 2016)
VBI OP-42 (Teletext/Subtitles)	→	ANC OP-47 (SMPTE 2031)
Line 21 (VBI CEA-608 data) (CC)	→	ANC CEA -608/708 (SMPTE 334-1)

ANC packages can be saved in QuickTime (CC only) and MXF OP1a files according to SMPTE 436.

Closed Caption

VENICE S allows pass through of embedded closed captions, insertion from closed caption files and SD/HD up and down conversion. Thereby SD closed captions conforms to the CEA-608. HD closed captions uses CEA-608 captions encapsulated within CEA-708 packets.

VENICE S supports embedded closed caption information stored in Quick-Time (MOV). It records embedded CEA-708 information from the incoming SDI signal in digital SD and HD.

When writing QuickTime files (ingest or transform) the closed caption data are preserved in the following order whereas the first type found is written into the files:

1 CEA-708 ANC (digital)
2 CEA-608 ANC (digital)

By default it is a QuickTime CEA-708 track ('c708').

A closed caption track will only be added to QuickTime files if valid closed caption data is detected on the first frame of the provided input or if writing of such a track has been enforced in the R&S®VENICE software (available with software version 3.5), in the R&S®Device Manager (available with software version 4) or via VENICE web service command `configureCodecRequest`.

Furthermore, closed captions are stored in MXF OP-1a files as defined in the SMPTE 436M standard. The closed captions are preserved with a head and tail trim. Then they can be played out to SDI again.

Multiple languages can be inserted into four data channels on line 21 from separate closed caption files. The first and the second closed caption track will be placed into field 1 of the video frame. If more tracks will be necessary closed caption information also can be written in a separate *.scc file. For this additional scc 3 files have to be enabled in the video settings of the R&S®Device Manager. Field 2 of a video frame then transfer closed caption tracks three and four.

For playout purposes external *.scc files can be inserted to the SDI signal.

(i) If transcoding one file format into another file format during ingest as well as transcoding the closed caption information could be lost with the following format: MXF (OP Atom, Sony XDCam IMX, AS02, AS11, IMF).

Closed Captions cannot be lost with the following formats: MOV, MXF (OP1a Generic, RDD09, Sony XDCam DV, XAVC) and MPEG-2.

Subtitles

VENICE S allows pass-through of embedded subtitles, insertion from subtitle files and SD/HD up and down conversion.

VENICE S supports embedded subtitling information in MXF OP1a files or additional in separate *.stl files. Subtitles can be read and written according to EBU Tech 3264-E.

For playout purposes, external *.stl files for multiple languages can be inserted into the SDI signal.

The subtitles configuration for VENICE is done in the R&S®Device Manager tool. If the respective "Record Subtitle Type" is enabled in the Subtitle Settings, the system automatically uses subtitles, if available. The "Subtitle File Path" setting in the "VDCP Settings" section is used to specify the directory where the system looks for subtitle files.

(i) For working instructions on how to perform these settings, see section "Configuring the Subtitles" on page 74.

Currently VENICE S supports Latin and Greek character sets.

Aspect Ratio

There are many technical issues while dealing with SD and HD content. SD content can be available in 16:9 or 4:3. HD content is always 16:9. A broadcaster must be able to playout all three types of material and switch seamlessly between them all. The aspect ratio can be changed at various points in the broadcast chain.

To get an optimal picture it is important that the format bring accurate information with it. Outside the US, WSS (Wide Screen Signaling) was sometimes used with SD signals to define the aspect ratio. The information was stored on VBI line 20 for NTSC and line 23 for PAL. Meanwhile AFD has replaced WSS for both, SD and HD material.

AFD (Active Format Description) describes the video picture in terms of the aspect ratio and other characteristics of the active image within the coded frame.

With one of the following values in the "AFD Data Mode" in the R&S®Device Manager or via the VENICE web service it can be determined, if the existing AFD data file should be used or if this data should be overwritten:

> ⓘ If transcoding one file format into another file format during ingest as well as transcoding the AFD information could be lost with the following format: MXF (OP Atom, Sony XDCam IMX, AS02, AS11, IMF).
>
> AFD data couldn't be lost with following formats: MXF (OP1a Generic, RDD09, Sony XDCam DV, XAVC) and MPEG-2.

Strip	All AFD data is removed.
PassThrough	The existing AFD data is passed through.
Generate	The existing AFD data is passed through. If no AFD data is present, AFD data is generated based on the current settings.
Replace	The AFD data is always generated based on the current settings. Existing AFD data is replaced.

The „AFD Reset Mode" can used to determine whether the AFD overwrite should be valid only for this clip or until further notice.

Supported Conversion Using AFD

VENICE S can be configured for SD, HD and UHD playout. So the server supports many different clip-related aspect ratio conversions (ARC) as shown in the following:

AFD In	Input (4:3)	AFD Out	Output (16:9)
0001	Reserved	-	Invalid
0010	Letterbox 16:9 image, at the top of the coded frame	1000	Full frame 16:9 image, the same as the coded frame
0011	Letterbox 14:9 image, at the top of the coded frame	1011	Pillarbox 14:9 image, horizontally centered in the coded frame
0100	Letterbox image with an aspect ratio greater than 16:9, vertically centered in the coded frame	0100	Letterbox image with an aspect ratio greater than 16:9, vertically centered in the coded frame
0101	Reserved	-	Invalid
0110	Reserved	-	Invalid
0111	Reserved	-	Invalid
1000	Full frame 4:3 image, the same as the coded frame	1001	Pillarbox 4:3 image, horizontally centered in the coded frame

AFD In	Input (4:3)	AFD Out	Output (16:9)
1001	Full frame 4:3 image, the same as the coded frame	1001	Pillarbox 4:3 image, horizontally centered in the coded frame
1010	Letterbox 16:9 image, vertically centered in the coded frame with all image areas protected	1010	Full frame 16:9 image, with all image areas protected
1011	Letterbox 14:9 image, vertically centered in the coded frame	1011	Pillarbox 14:9 image, horizontally centered in the coded frame
1100	Reserved	-	Invalid
1101	Full fame 4:3 image, with alternative 14:9 center	1101	Pillarbox 4:3 image
1110	Letterbox 16:9 image, with alternative 14:9 center	1110	Full frame 16:9 image
1111	Letterbox 16:9 image, with alternative 4:3 center	1111	Full frame 16:9 image

AFD In	Input (16:9)	AFD Out	Output (4:3)
0001	Reserved	-	Invalid
0010	Full frame 16:9 image, the same as the coded frame	1010	Letterbox 16:9 image, vertically centered in the coded frame with all image areas protected
0011	Pillarbox 14:9 image, horizontally centered in the coded frame	1011	Letterbox 14:9 image, vertically centered in the coded frame
0100	Letterbox image with an aspect ratio greater than 16:9, vertically centered in the coded frame	0100	Letterbox image with an aspect ratio greater than 16:9, vertically centered in the coded frame
0101	Reserved	-	Invalid
0110	Reserved	-	Invalid
0111	Reserved	-	Invalid
1000	Full frame 16:9 image, the same as the coded frame	1010	Letterbox 16:9 image, vertically centered in the coded frame with all image areas protected
1001	Pillarbox 4:3 image, horizontally centered in the coded frame	1000	Full frame 4:3 image, the same as the coded frame
1010	Full frame 16:9 image, with all image areas protected	1010	Letterbox 16:9 image, vertically centered in the coded frame with all image areas protected

Features

AFD In	Input (16:9)	AFD Out	Output (4:3)
1011	Pillarbox 14:9 image, horizontally centered in the coded frame	1011	Letterbox 14:9 image, vertically centered in the coded frame
1100	Reserved	-	Invalid
1101	Pillarbox 4:3 image, with alternative 14:9 center	1101	Full frame 4:3 image, with alternative 14:9 center
1110	Full frame 16:9 image, with alternative 14:9 center	1110	Letterbox 16:9 image, with alternative 14:9 center
1111	Full frame 16:9 image, with alternative 4:3 center	1111	Letterbox 16:9 image, with alternative 4:3 center

In the following figure represent the most common conversions.
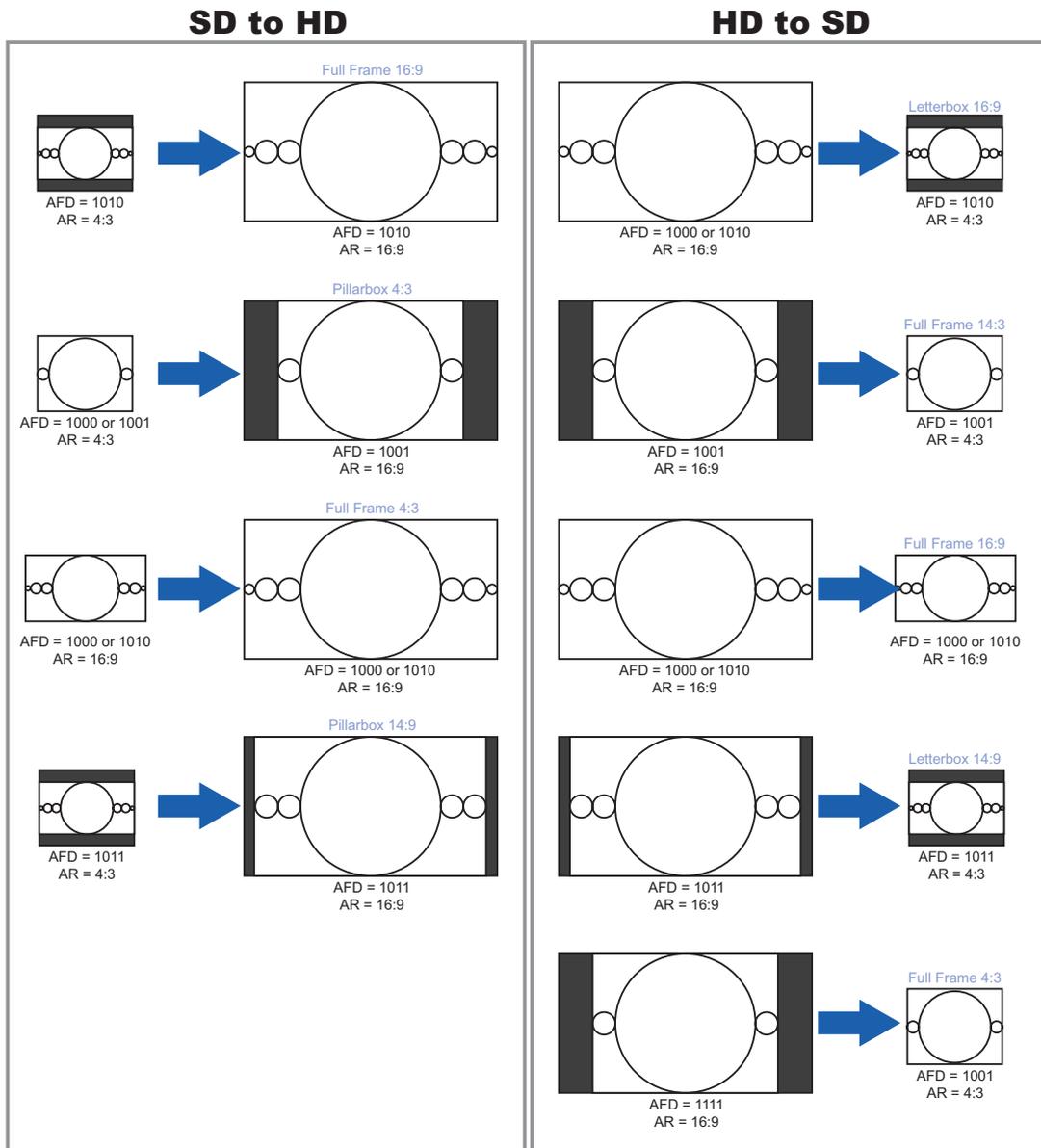
Incorrectly set AFD's are ignored.

At any time AFD values might be overwritten with the VENICE web service command `ActiveFormatBase`. This setting is also possible in the R&S®Device Manager. Furthermore you can scale and resize the video material if output format and the format of the video material are different. Therefor the following parameter are available:

Off	The material will maintain its original size.
Box	The original material will be scaled to its maximum allowable width or height so that no information gets lost. If the aspect ratio is different, you will receive black bars in the output.
Crop	The images will be scaled to their maximum allowable width or height so that you receive a full image at the output. If the aspect ratio is different, parts of the images will be cropped.
Fit	The aspect ratio will not be preserved. The resulting images will be stretched or compressed if the aspect ratio is different and you will always receive a full image in the output.
Active Format Based	The scaling will be performed based on the "Supported Conversion Using AFD" on page 20.

Audio Routing

The R&S®Device Manager allows an easy audio routing of every video channel.

DolbyE

VENICE S supports the pass trough of DolbyE audio. Thereby DolbyE tracks will be handled as PCM audio. For example: if an MXF file has 8 channels of PCM audio, it is possible that the first two channels (1 and 2) transfer DolbyE while the other channels (3 -6) transfer normal PCM audio. It is also possible the other way around, so that the first six channels transfer PCM audio and the last two channels DolbyE.

Image Processing

VENICE supports upscaling during playout and transform operations.

INPUT \ OUTPUT	480i29.97	576i25	720p50	720p59.94	1080p25	1080p/9.97	1080i25	1080p50	1080i29.97	1080p59.94	2160p50	2160p59.94
480i29.97	x								x			
576i25		x					x					
720p50			x		x			x			x	
720p59.94				x		x				x		x
1080p25			x		x			x			x	
1080p29.97				x		x			x	x		x
1080i25		x					x					
1080p50			x		x			x			x	
1080i29.97	x								x			
1080p59.94				x		x				x		x
2160p50			x		x			x			x	
2160p59.94				x		x				x		x

Timecode

VENICE S supports a wide range of timecode types:

- Internal
- Generic (Timecode of media file)
- LTC (Longitudinal Timecode)
- VITC (Vertical Interval Timecode)
- VTRTC (RS-422 Timecode)
- DVITC (Digital Vertical Interval Timecode
- DLTC (Digital Longitudinal Timecode)
- Time of day

On video tapes the VITC is basically stored for each frame in one video line of the vertical blanking interval. While the LTC is recorded along the tape, mostly for this, an audio track is used. In opposite to VITC, the LTC can be read out during a fast forward and written later. Certainly during a still image (paused) or during a slow forward the LTC can not be read out. With VITC it's possible.

DLTC and DVITC is inserted in the vertical blanking interval of the SDI-Signal. It won't be published in the video image. DVITC replaces the previously used VITC of analog systems. DVITC will be recorded most preferably in line 9 and 10 of the SDI signal at the output of MAZ devices.

VTRTC (RS-422) is a via RS-422 transferred timecode of a controlled video source.

Time of day is the actual time of the device.

Play After Write

The automated play after write functionality allows a true visual quality check. It reads the open file being currently recorded directly from the disk. The operator can see the file and can judge its quality directly after the video has passed the encoding process and has been written to the storage.

ⓘ Please note that for the play after write feature an additional channel for playout is needed. Furthermore, the ingest and playout channels need to be on the same VENICE server.

Type Plate and Serial Number

The serial number of the system is located on the type plate.

Type Plate

The type plate itself is located on the slide-out panel (information tag) which can be accessed on the front of the system (bottom right).
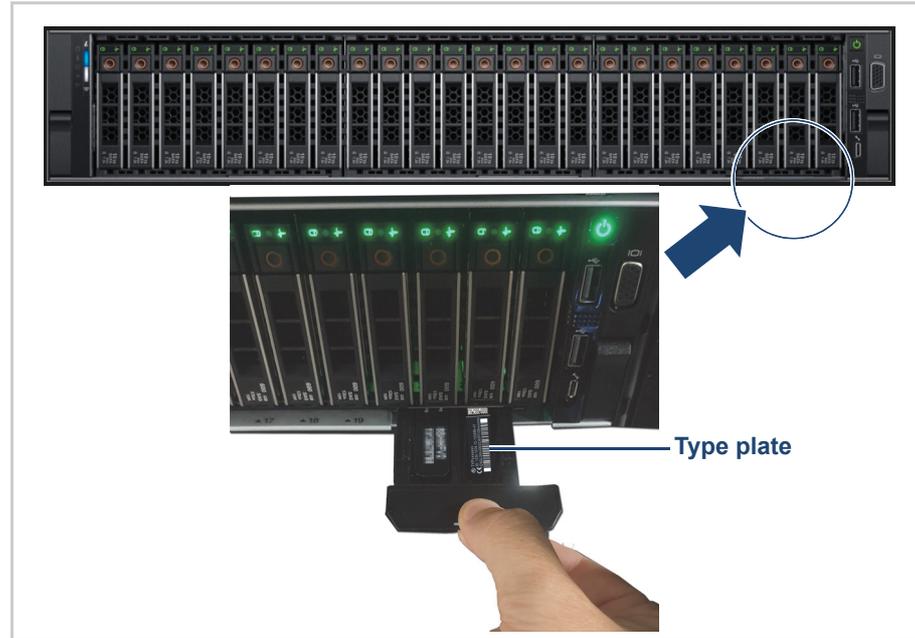
Location of the type plate on the slide-out panel
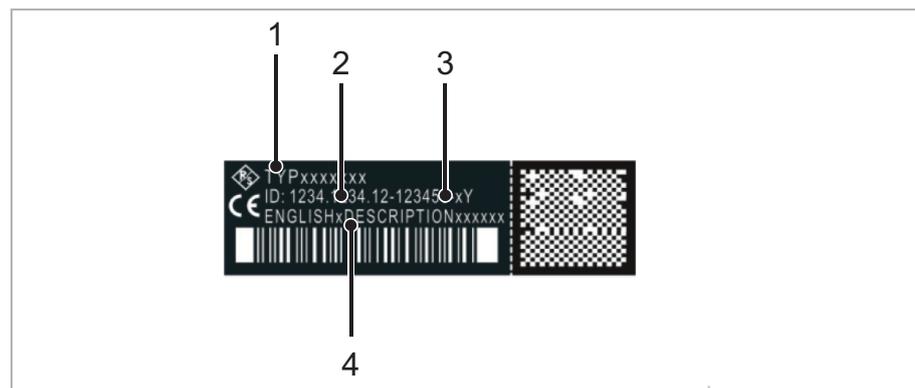
Type plate

1	Type
2	Article number
3	Serial number, see also "Serial Number" (page 28)
4	Product description

Serial Number

The serial number is part of the system ID. It is the 6-digit number that comes after the article number:
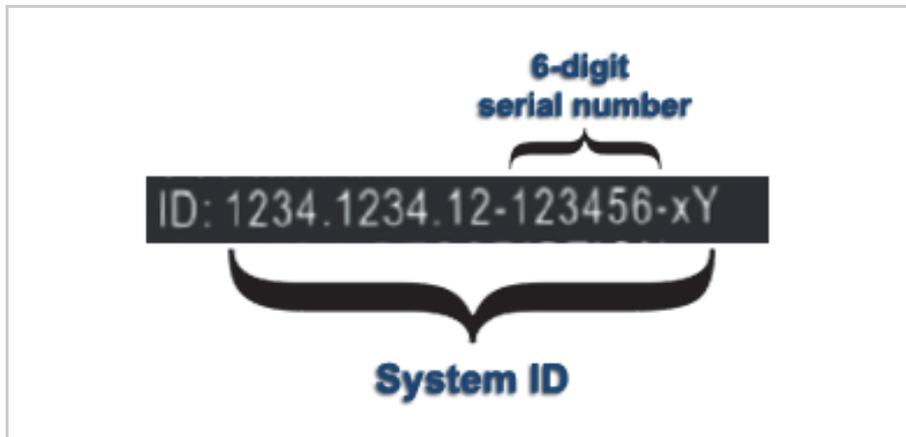
Serial number as part of the system ID

This 6-digit serial number is used as password when logging in to:

- R&S®Device Manager web frontend (username: "administrator")
- VENICE_S server (username: "root")

Scope of Delivery

The following components are included:

- VENICE S chassis
- Rack mount kit
- Cable management kit
- Power cable (rack)
- 2x SR SFP+ 10GbE optical transceiver
- 8x SDI 3G SFP bundle: SDI 3G combined input and output SFPs for 8 bidirectional HD/SDI channels (includes 4x 3G dual receiver and 4x 3G dual transmitter)
- Product documentation

Optional:

- 2x VENICE accessory kit: 8x HD-BNC to BNC adapter cables, 4x RJ45 to DB9-adapter cables (RS422), 1x HD-D-SUB 26 male to 8 x XLR female/male breakout cables.

The Front of the System

Front Plate

The front plate covers all operation items and the disk array. It is attached on mounting on the left and on the right side in the front.
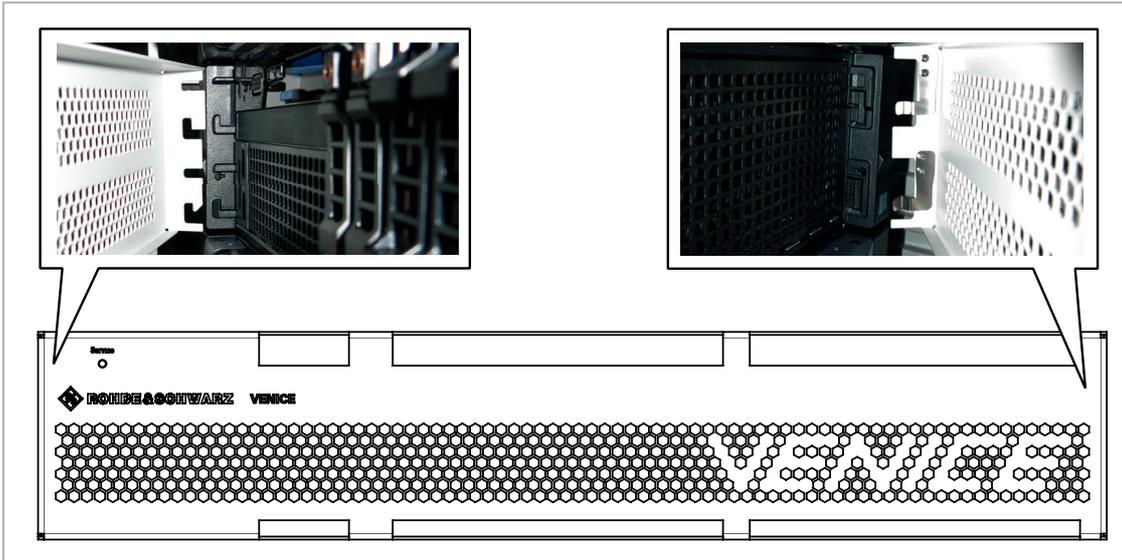
Front plate

Chassis Front
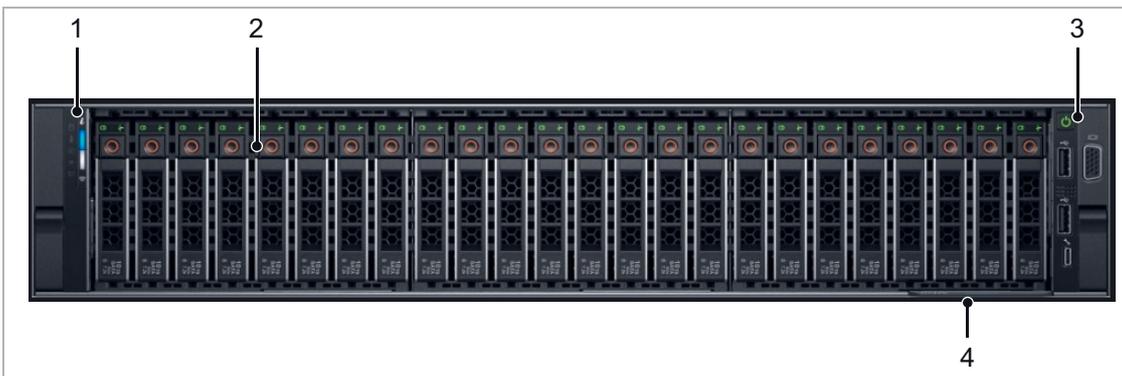
Chassis front

1	Left control panel	Contains system health and system ID, status LED and optional iDRAC Quick Sync 2 (wireless). For more information see chapter "Left Control Panel" on page 31
2	Hard drives	Up to 30 2.5-inch hot-swappable hard drives.

3	Right control panel	Contains the power button, VGA port, iDRAC Direct micro USB port, and two USB 2.0 ports. For more information see chapter "Right Control Panel" on page 31
4	Information tag	Contains system information such as service tag, NIC, MAC address for your reference. The information tag is a slide-out label panel, see also "Type Plate and Serial Number" on page 27.

Left Control Panel
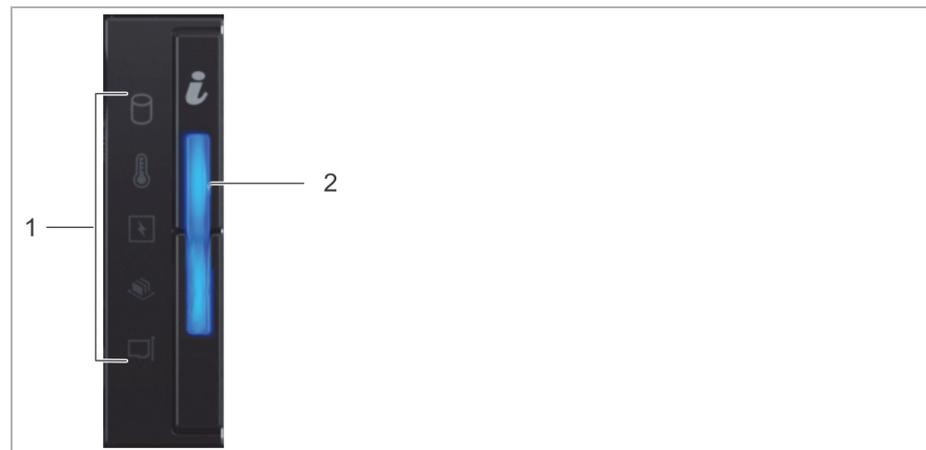
Control panel left

1	Status LED indicators	N/A	Indicate the status of the system.
2	System health and system ID indicator	ⓘ	Indicates the system health.

Right Control Panel
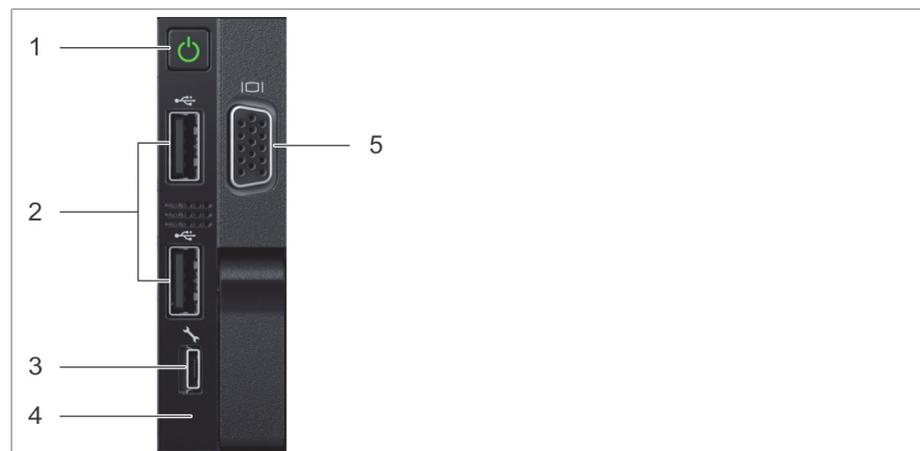
Control panel right

The Front of the System

1	Power button	⏻	Enables you to know the power status of the system. The power indicator turns on when the system power is on. The power button controls the power supply output to the system.
2	USB port	⇷	Enables you to connect USB devices to the system. The ports are USB 2.0 compliant.
3	iDRAC Direct port	🔧	Enables you to connect USB devices to the system or provides access to the iDRAC Direct features. The USB management port is USB 2.0 compliant.
4	iDRAC Direct LED	N/A	The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is connected.
5	Video connector	|◻|	Enables you to connect a VGA display to the system.

Hard Drives
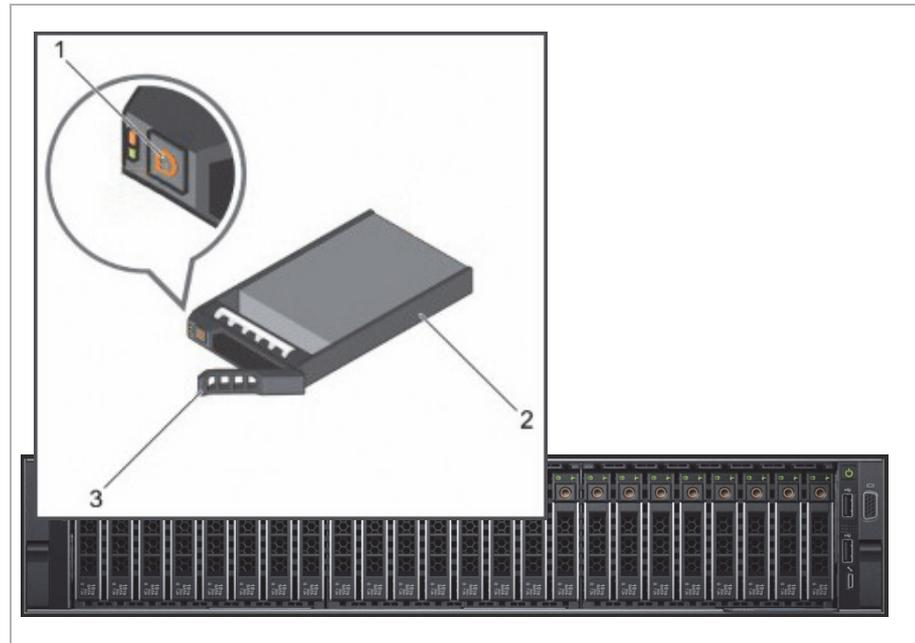
Hard drives

1	Release button
2	Hard drive carrier
3	Hard drive carrier handle

For more information about removing and installing a hard drive see chapter "Replacing a Hot Swappable Hard Drive" on page 132.

Hard Drive Indicators
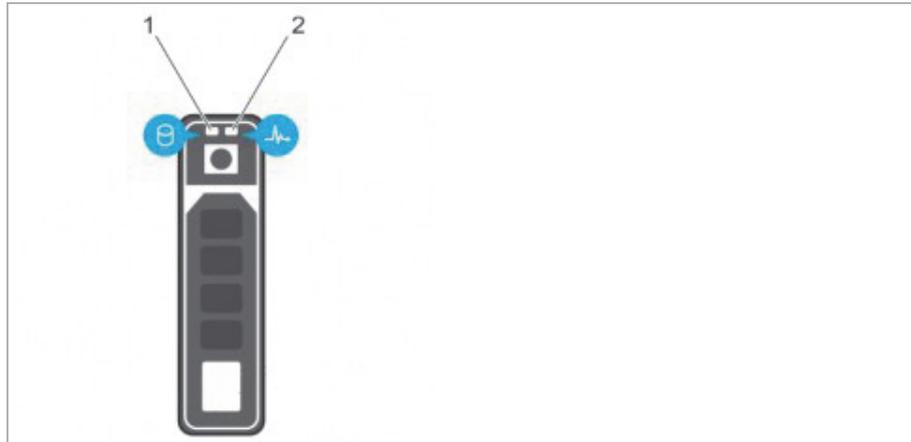
Hard drive indicators

1	Hard drive activity indicator
2	Hard drive status indicator

> **(i)** If the hard drive is in the Advanced Host Controller Interface (AHCI) mode, the status indicator (on the right side) does not function and remains off.

Hard Drive Indicator Codes

Flashes green twice per second	Identifying drive or preparing for removal.
Off	Drive ready for insertion or removal. **NOTE: The drive status indicator remains off until all hard drives are initialized after the system is turned on. Drives are not ready for insertion or removal during this time.**
Flashes green, amber, and turns off	Predicted drive failure
Flashes amber four times per second	Drive failed
Flashes green slowly	Drive rebuilding
Steady green	Drive online
Flashes green for three seconds, amber for three seconds, and turns off after six seconds	Rebuild stopped

The Rear of the System

Back Panel

Back panel

1	Full height PCIe slot (3)	N/A	Enables you to connect up to three full-height PCI Express expansion cards.
2	HD-BNC connector	N/A	Reference input
3	SFP+ port (4)	N/A	In-/Output of digital video signals For more information see chapter "In-/Output of Digital Video Signals" on page 39.
4	HD-BNC connector	N/A	Downconvert video output For more information see chapter "Downconvert Video Output" on page 38.
5	RJ45 connector, serial RS-422 interface (4)	N/A	Out- or input of primary/secondary control signals For more information see "Out- or Input of Primary/Secondary Control Signals" on page 37 and for the pin assignment chapter "RJ45 Connector" on page 50.
6	HD Sub-D connector	N/A	LTC In/Out For more information see chapter "LTC In/Out" on page 35 and for the pin assignment chapter "HD Sub-D Connector (LTC In/Out)" on page 49.
7	Power supply unit (PSU) (2)	N/A	AC 1100 W For more information see chapter "Power Supply Unit" on page 36.
8	Handle	N/A	
9	Ethernet connector (4)	🖧	Four integrated connectors that include: ● Two 10 Mbps/100 Mbps/1 Gbps NIC connectors ● Two 100 Mbps/1 Gbps/10 Gbps SFP+/10 GbE T connectors For more information see "Network Interface Card (NIC) Connectors" on page 43.
10	USB port (2)	⇜	Enables you to connect USB devices to the system. The ports are USB 3.0-compliant.
11	Video connector	▭	Enables you to connect a VGA display to the system. For the pin assignment see chapter "Video Connector" on page 52.

12	Serial connector	IOIOI	Enables you to connect a serial device to the system. For the pin assignment see chapter "Serial Connector" on page 51.
13	iDRAC Enterprise port	🔧	Dedicated management port.
14	System identification button	ⓘ	The identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pressed, the LCD panel on the front and the system status indicator on the back flashes until one of the buttons is pressed again. Press to toggle the system identification (ID) on or off.

LTC In/Out
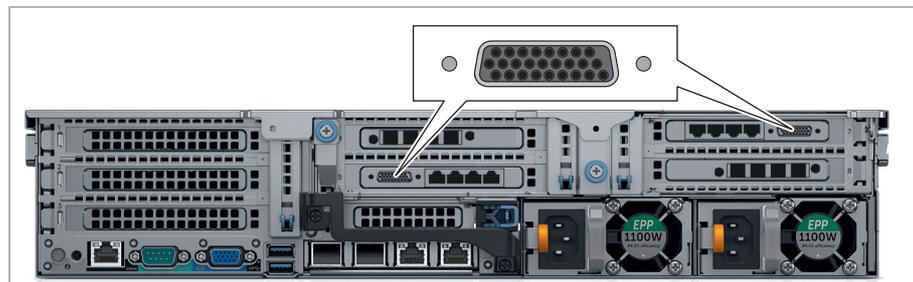
HD Sub-D connector

Besides the timecode options which are described in chapter "Timecode" on page 25 VENICE S gives you the possibility to use LTC timecode on each channel for ingest and playout. Receive or provide LTC timecode with the supplied Lynx cable (see chapter "Lynx CBL-AES1604 Cable" on page 54).

Via the R&S®Device Manager it's possible to assign LTC timecode that is received by one channel to all other channels.

Power Supply Unit

Your system supports two 1100 W multi range PSUs (90 - 240 VAC).
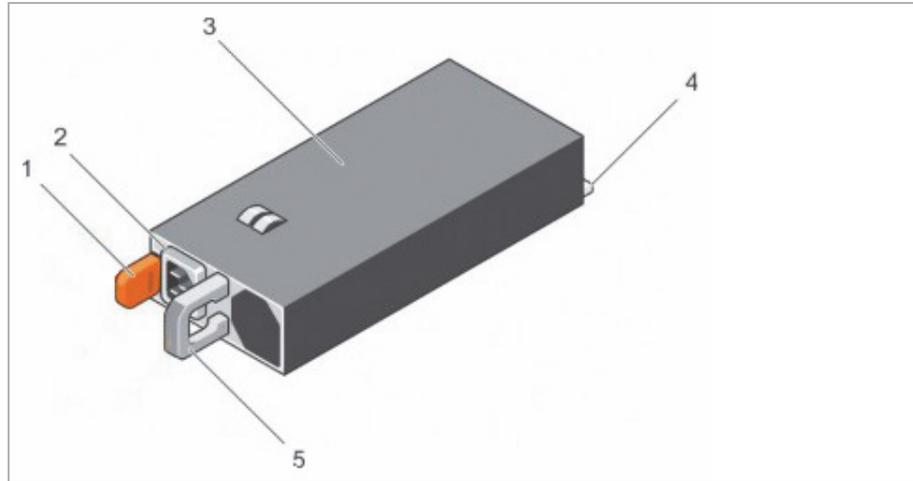
Power supply unit

1	Release latch
2	Power supply status indicator
3	PSU
4	Power connector
5	PSU handle

For more information about removing and installing a PSU see chapter "Replacing a Power Supply Unit" on page 130.

Power Supply Indicator

AC power supply units (PSUs) have an illuminated translucent handle that serves as an indicator. The indicator shows whether power is present or a power fault has occurred.
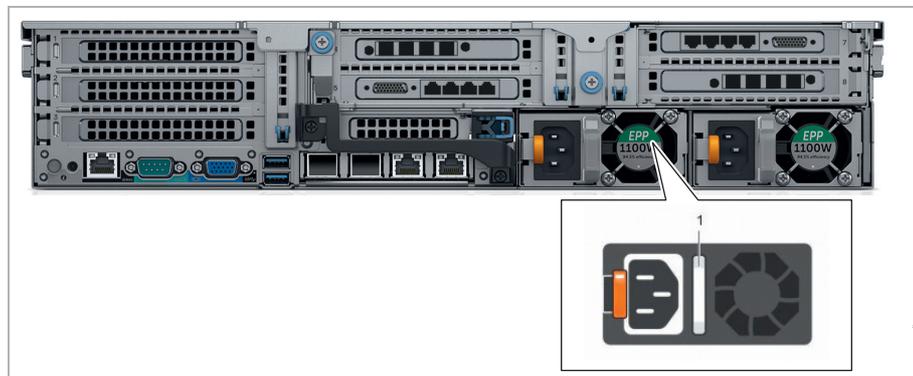
PSU status indicator

1	PSU status indicator/handle

PSU Status Indicator Codes

PSU status indicator codes

	Status	Condition
A	Green	A valid power source is connected to the PSU and the PSU is operational.
B	Flashing green	When the firmware of the PSU is being updated, the PSU handle flashes green.
C	Flashing green and turns off	When hot-adding a PSU, the PSU handle flashes green five times at 4 Hz rate and turns off. This indicates a PSU mismatch concerning efficiency, feature set, health status, and supported voltage.
D	Flashing amber	Indicates a problem with the PSU.

Out- or Input of Primary/Secondary Control Signals
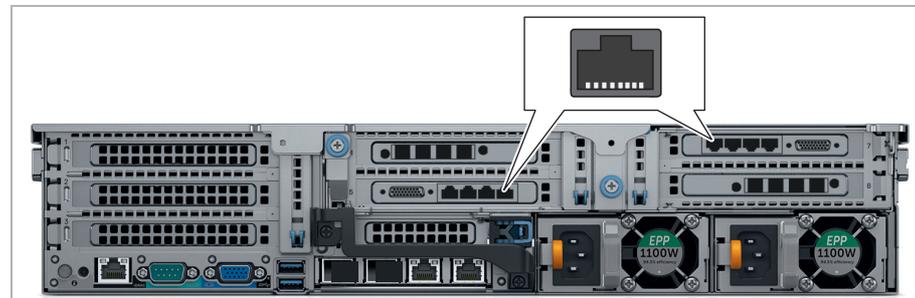
RJ45 connector

During a standard operation the pin-outs of the RJ45 connector are adjusted to secondary control mode. To use the full functionality of this connector you have to use the supplied adapter cable. For more information about the cable see chapter "Adapter Cable" on page 52. For the pin assignment see chapter "RJ45 Connector" on page 50.

With software version 4 in normal operation VENICE S is in secondary control mode. With software version 3.5 it is possible to change between primary and secondary mode in the R&S®VENICE Client software.

Downconvert Video Output
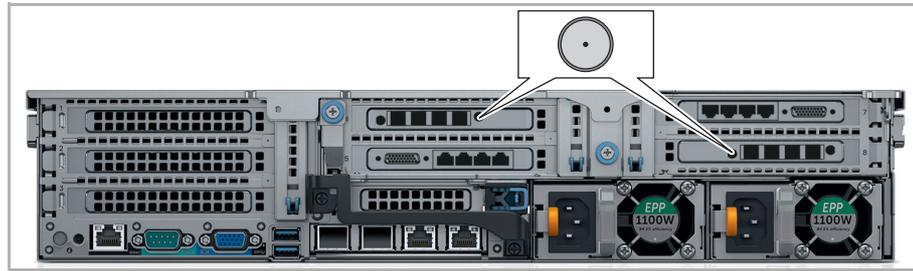
HD-BNC connector

The downconvert video output can be used for HD monitoring while the system is configured for UHD operation. The downconvert functionality is only active with UHD or 4K rasters. If enabled the UHD material will be send via the SDI outputs (1 channel operation) and the HD material via the downconvert output. In principle the signal is suitable for broadcast operations (e.g. Simulcast Playout). Please note the following restrictions.

ⓘ Ingest signals (e.g. ingest of external satellite feeds), which are asynchronously to the output can cause frame repetitions or drop frames.

ⓘ Compared to the UHD output the downconvert output is delayed by a number of frames.

Standard Conversion

ⓘ The frame rate of the downconvert output must be either the same as the frame rate of the UHD raster or a multiple of it.

Output for 2160p50 Input:
- 576i50[1]
- 720p50
- 1080p25[2]
- 1080psf25[2]
- 1080i50
- 1080p50

Output for 2160p59,94 Input:
- 480i59,94[1]
- 720p59,94
- 1080p29,97[2]
- 1080psf29,97[2]
- 1080i59,94
- 1080p59,94

[1] Each full p frame will be converted to a single field in alternating order. All original motion phases will be kept during this conversion. Due to the enormous scaling factor from SD to UHD this conversion might incooperate aliasing.

[2] This conversion skips every second original frame resulting in a reduction of temporal resolution.

In-/Output of Digital Video Signals

The SFP+ ports are used for an in-/output of single-link and/or quad-link SDI video signals in 1.5G, 3G, 6G, and 12G.
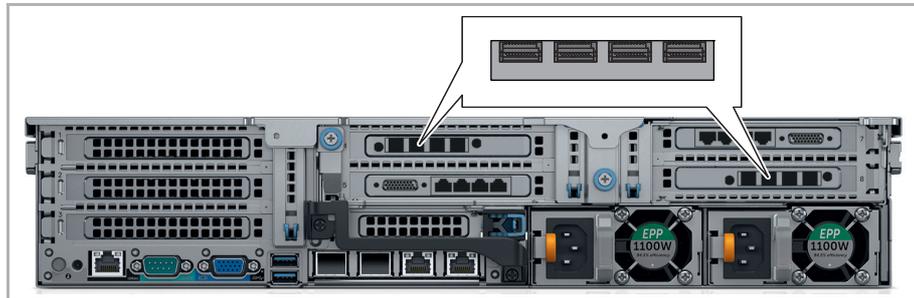
To use the functionality you have to insert the dual receiver and the dual transmitter into the SFP+ ports. For more information see chapter "Installing the System" on page 58.

> (i) Use only original Rohde & Schwarz certified parts.

Channel Assignment

There are two configuration options depending on whether the system is equipped with 12G-capable SFP modules or only 3G modules are available.

3G Configuration Option

3G SDI SFP coaxial dual transmitter

3GSDI SFP coaxial dual receiver

The Rear of the System

With the 3G configuration option all installed SFP modules are 3G-capable only. Higher input/output modes such as 6G and 12G are also available, however only in quad link mode.
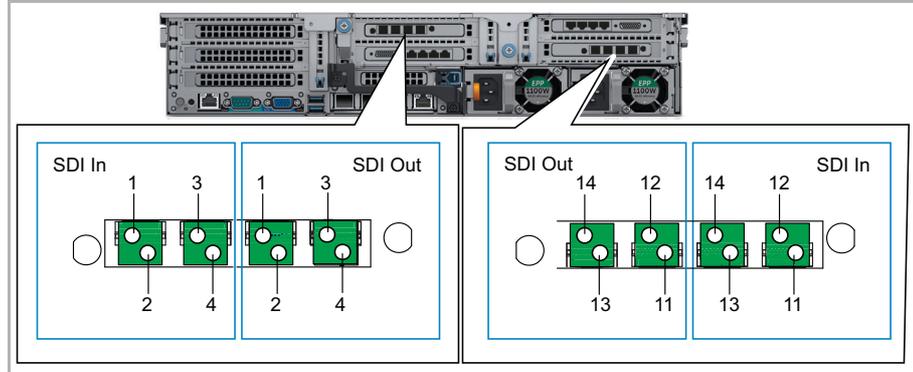
3G Configuration

You can use any of the channels in single link mode (1.5G or 3G). For quad link mode use 1 - 4 (and respectively 11 - 14) to form a quadrant, i.e 1.5G x 4 for 6G, or 3G x 4 for 12G.

12G Configuration Option:

12G SDI SFP coaxial dual transmitter

12GSDI SFP coaxial dual receiver

In 12G mode, every other module is 12G-capable whereas the rest of the installed modules are still 3G:
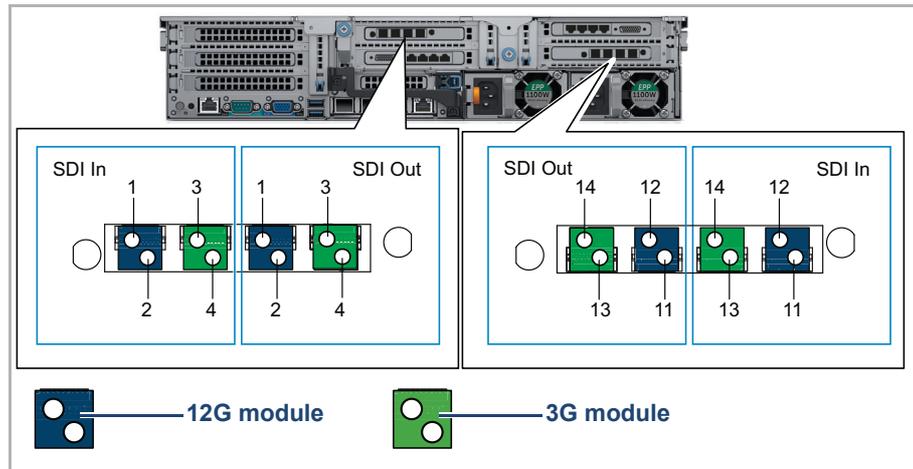
12G Configuration

In 12G configuration mode, channel 1 (and channel 11 respective-ly) are reserved for 12G single link operation. The rest of the chan-nels can still be used in combination to form other input/output modes similar to the 3G configuration option.

The desired output mode is set in the VENICE UI software via the context menu of the associated channel ("Video settings" > "Playout" > "Output link").
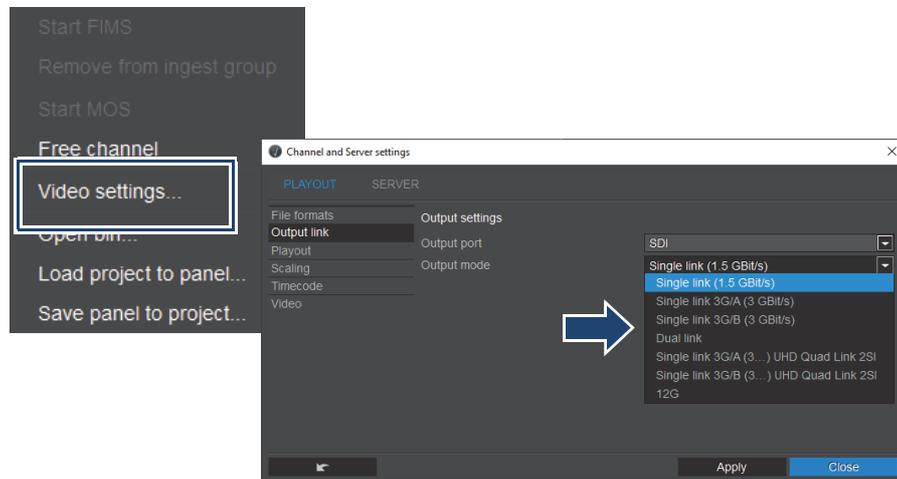
Video I/O Formats

SDI 270 Mb/s Single Link

Standard	Raster	Framerate	Cabling per channel
SMPTE 259M	525i	29.97 fps	1x SDI 1.5G
SMPTE 259M	625i	25 fps	

SDI 1.5G Single Link

Standard	Raster	Framerate	Cabling per channel
SMPTE 274M	1080i, 1080p, 1080PsF	25 fps, 29.97 fps	1x SDI 1.5G
SMPTE 296M	720p	25fps, 29.97fps, 50fps, 59.94fps	

SDI 3G Single Link (Level a or B)

Standard	Raster	Framerate	Cabling per channel
SMPTE 425	1080p	50fps, 59.94fps	1x SDI 3G

SDI 6G Single Link

Standard	Raster	Framerate	Cabling per channel
SMPTE 2081	2160p	25fps, 29.97fps	1 x SDI 6G on 12G modules (port 1 or 11 only)

SDI 12G Single Link

Standard	Raster	Framerate	Cabling per channel
SMPTE 2082	2160p	50fps, 59.94fps	1 x SDI 12G (port 1 or 11 only)

Network Interface Card (NIC) Connectors
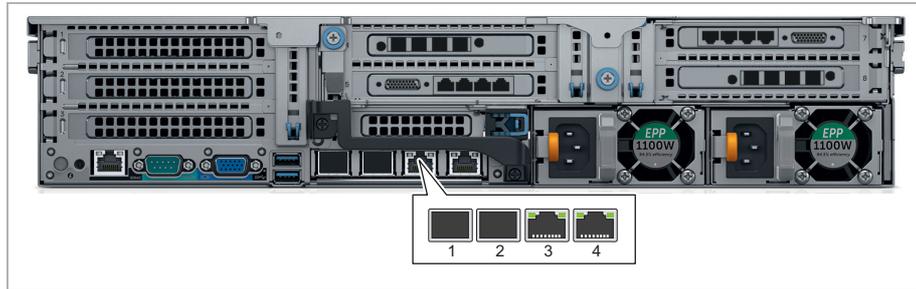
Ethernet connectors

	Port	Configuration	Speed
1	eno1	unconfigured	10 Gbps SFP+
2	eno2	unconfigured	10 Gbps SFP+
3	eno3	DHCP	1 Gbps RJ45
4	eno4	static IP address: 10.0.0.8	1 Gbps RJ45

NIC Indicator
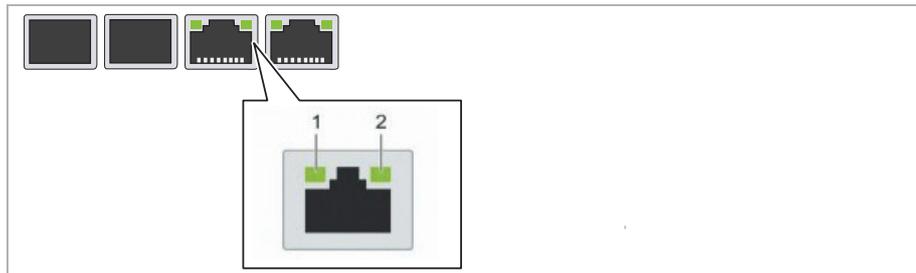
NIC indicator

1	Link indicator
2	Activity indicator

NIC Indicator Codes

NIC indicator codes

	Status	Condition
A	Link and activity indicators are off	The NIC is not connected to the network.
B	Link indicator is green	The NIC is connected to a valid network at its maximum port speed (1 Gbps or 10 Gbps).

The Rear of the System

C	Link indicator is amber	The NIC is connected to a valid network at less than its maximum port speed.
D	Activity indicator is flashing green	Network data is being sent or received.

Inside the System

To get access to different components for example to replace a cooling fan you have to remove the system cover.

System Cover

The system cover protects the components inside the system. Removing the system cover actuates the intrusion switch which aids in maintaining system security.
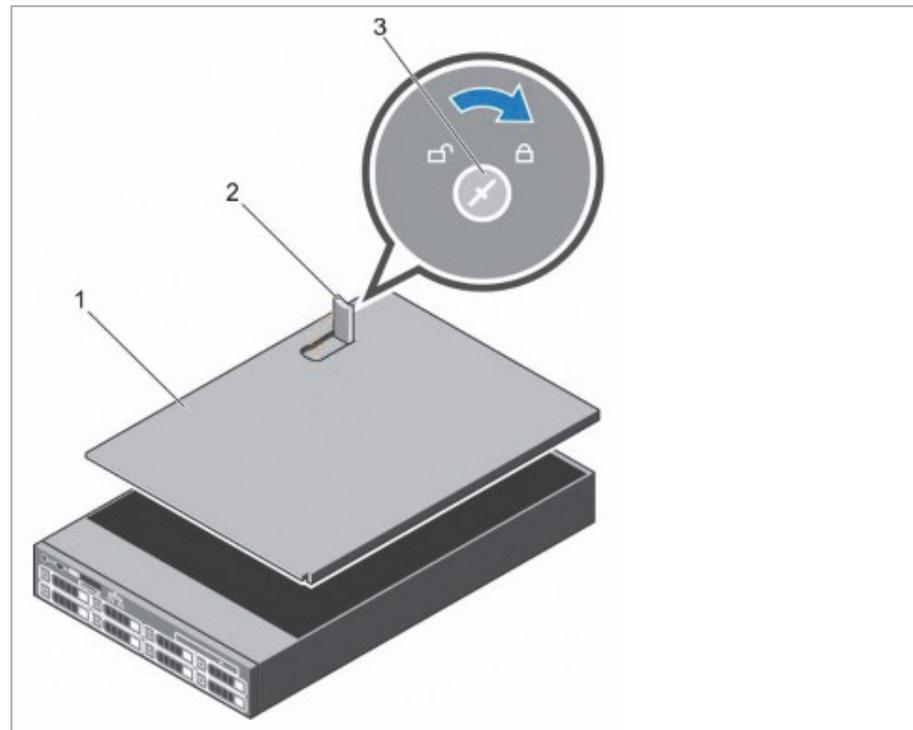
System cover

1	System cover
2	Latch
3	Latch release lock

For more information about opening and closing the system cover see chapter "Removing the System Cover" on page 128 and chapter "Installing the System Cover" on page 129.

Cooling Fan Assembly
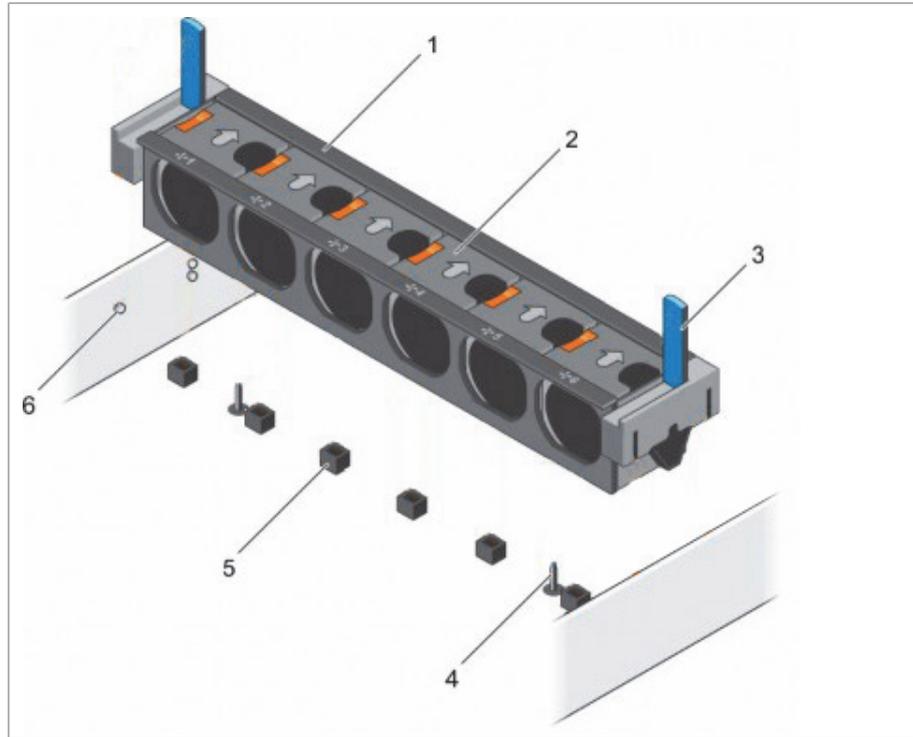
Cooling fan assembly

1	Cooling fan assembly
2	Cooling fan (6)
3	Release lever (2)
4	Guide pin on the system board (2)
5	Cooling fan connector (6)
6	Guide pin on the chassis (6)

The cooling fan assembly is an essential part of a server's cooling system. It ensures that the key components of the server such as the processors, hard drives, and memory get adequate air circulation to keep them cool. A failure in the server's cooling system can result in the server overheating and may lead to damage.

For more information about removing and installing the cooling fan assembly see chapter "Replacing a Cooling Fan Assembly" on page 134.

Cooling Fans

Your system supports six hot-swappable cooling fans.
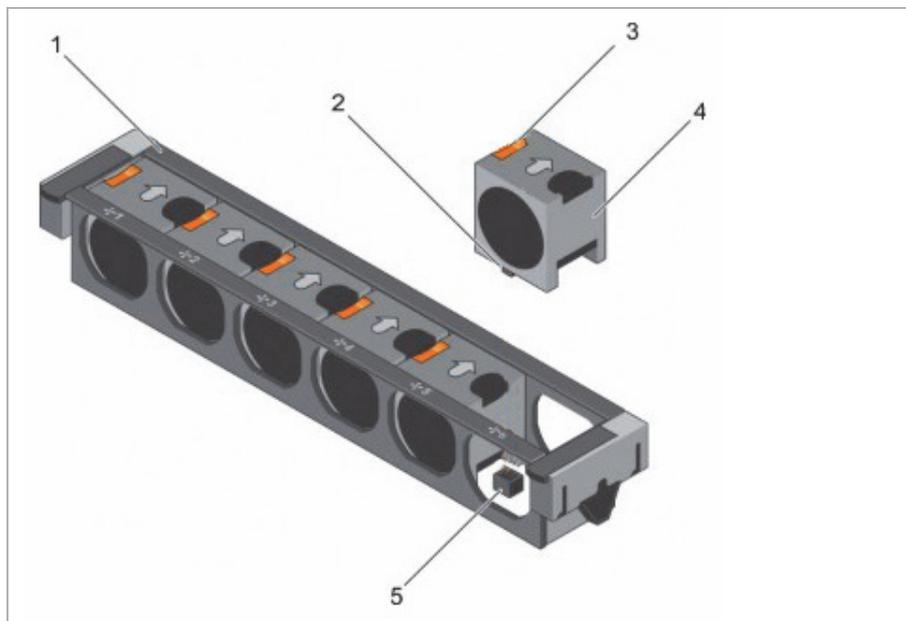
Cooling fans

1	Cooling fan assembly
2	Cooling fan connector (6)
3	Fan release tab (6)
4	Cooling fan (6)
5	Cooling fan connector on the system board (6)

In the event of a problem with a particular fan, the fan number is referenced by the R&S®Device Manager, allowing you to easily identify and replace the proper fan by noting the fan numbers on the cooling fan assembly.

For more information about removing and installing a cooling fan see chapter "Replacing a Cooling Fan" on page 135.
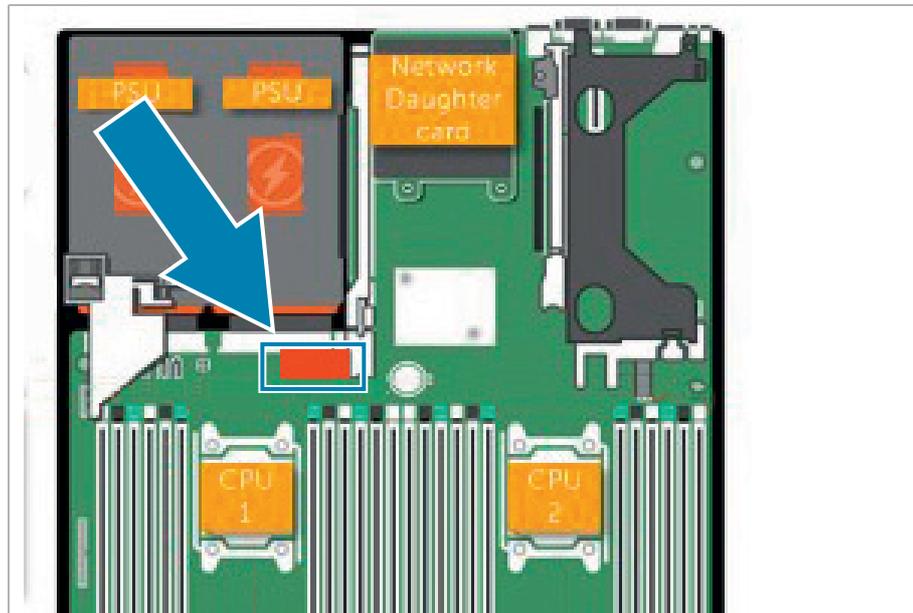
Rescue Stick

Rescue stick

The VENICE contains an internal USB flash drive that can be used to restore the operating system on the system disk back to its manufacturing state. Further information you will find in chapter "Replacing the Internal USB Memory Key" on page 137, chapter "Creating a Backup Image" on page 80 and chapter "Restoring the System" on page 83.

Pin Assignment

HD Sub-D Connector (LTC In/Out)

The HD Sub-D Connector enables you to use LTC In/Out. For all necessary information see chapter "LTC In/Out" on page 35 and information about the cable available in chapter "Lynx CBL-AES1604 Cable" on page 54.

HD Sub-D connector (external view on device [female])

Pin No.	Signal	Pin No.	Signal
1	GROUND	14	OUT1 N
2	OUT4 N	15	IN4 P
3	GROUND	16	IN3 N
4	OUT2 N	17	IN2 P
5	GROUND	18	IN1 N
6	IN4 N	19	GROUND
7	GROUND	20	OUT3 P
8	IN2 N	21	GROUND
9	GROUND	22	OUT1 P
10	WORDCLOCK OUT	23	GROUND
11	OUT4 P	24	IN3 P
12	OUT3 N	25	GROUND
13	OUT2 P	26	IN1 P

RJ45 Connector

The RJ45 connector enables you to use Primary/Secondary control. For more information see chapter "Out- or Input of Primary/Secondary Control Signals" on page 37.
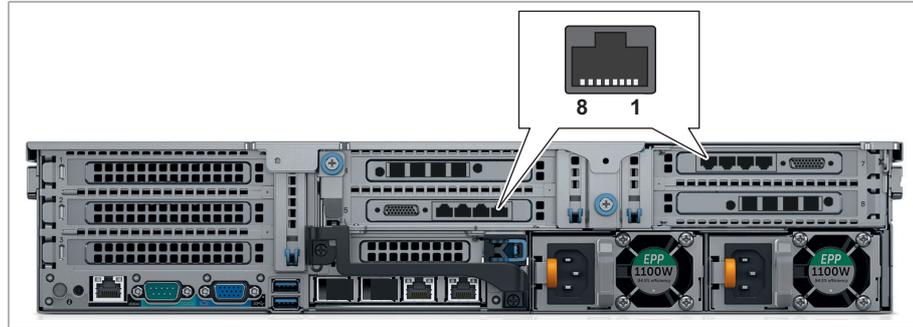
RJ45 connector, serial RS-422 interface (4) (external view on device [female])

RJ45 Pin No.	Secondary Mode (default) Signal	Primary Mode Signal
1	GND	GND
2	reserved	reserved
3	RX (+)	TX (+)
4	TX (-)	RX (-)
5	TX (+)	RX (+)
6	RX (-)	TX (-)
7	not connected	not connected
8	not connected	not connected

(i) If you want to manufacture a direct line VDCP cable please note the secondary mode assignment above. Your VDCP cable should connect the automation's TX+/- pins with the RX+/- pins of the VENICE S and vice versa (**+** to **+** and **-** to **-** and of course GND/ground).

Serial Connector

The COM port enables you to connect a serial device to the system.
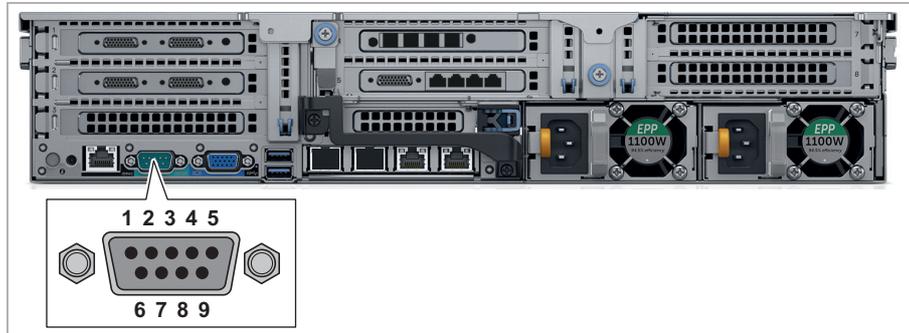
R232 connector (external view on device [female])

Pin No.	Signal	Pin No.	Signal
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground		

Video Connector

The VGA port enables you to connect a VGA display to the system.
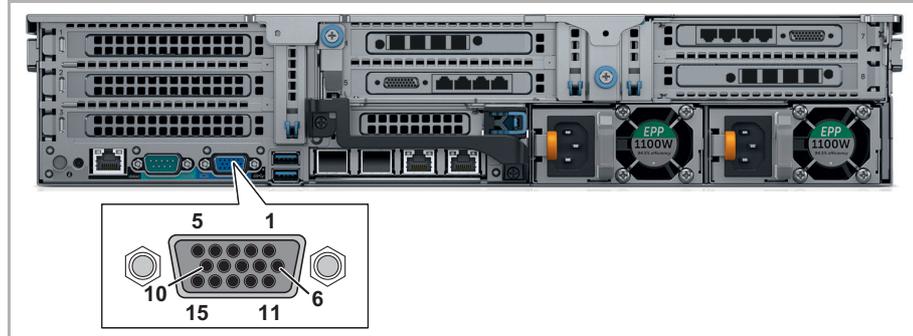
DB-15 connector (external view on device [female])

Pin No.	Signal	Pin No.	Signal
1	RED	9	KEY
2	GREEN	10	SGND
3	BLUE	11	ID0
4	ID2	12	ID1 or SDA
5	GND	13	HSYNC or CSYNC
6	RGND	14	VSYNC
7	GGND	15	ID3 or SCL
8	BGND		

Adapter Cable

With the adapter cable its possible to transfer the primary/secondary control signal. For more information see chapter "RJ45 Connector" on page 50.

RS-422 (RJ-45 [RIB7.0] male to D-Sub 9

RJ-45   **D-Sub 9**
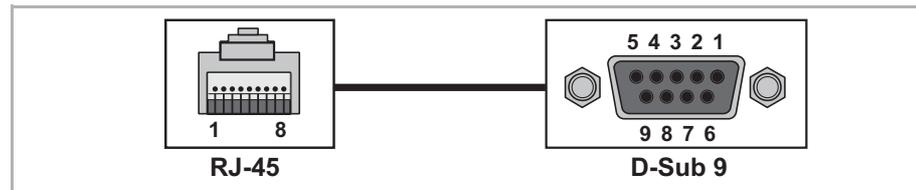
RS-422 (RJ45 [RIB7.0] male to D-Sub 9 female, external view)

RJ45 Pin No.	Secondary Mode (default) Signal	Primary Mode Signal	D-Sub 9 Pin No.
1	GND	GND	4, 6
2	reserved	reserved	5
3	RX (+)	TX (+)	3
4	TX (-)	RX (-)	2
5	TX (+)	RX (+)	7
6	RX (-)	TX (-)	8
7, 8	not connected	not connected	1, 9

Output		
RJ-45 Pin No.	**Signal**	**D-Sub 9 Pin No.**
3	TX (+)	3
6	TX (-)	8
5	RX (+)	7
4	RX (-)	2
1	Ground	4, 6
2	Reserved	5
7,8	not connected	1, 9

Lynx CBL-AES1604 Cable

The Lynx CBL-AES1604 cable allows you to transfer an LTC in- and output signal for each channel. For more information see chapter "LTC In/Out" on page 35.

Lynx CBL-AES1604 cable
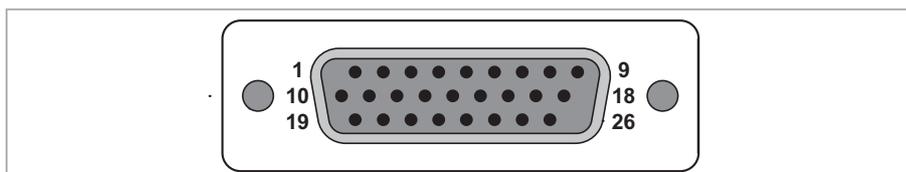
Lynx CBL-AES1604 cable (external view)

Pin No.	Signal	Pin No.	Signal
1	GROUND	14	OUT1 N
2	OUT4 N	15	IN4 P
3	GROUND	16	IN3 N
4	OUT2 N	17	IN2 P
5	GROUND	18	IN1 N
6	IN4 N	19	GROUND
7	GROUND	20	OUT3 P
8	IN2 N	21	GROUND
9	GROUND	22	OUT1 P
10	WORDCLOCK OUT	23	GROUND
11	OUT4 P	24	IN3 P
12	OUT3 N	25	GROUND
13	OUT2 P	26	IN1 P

Network Ports

This section lists the default TCP and UPD ports used by VENICE S. All ports are open by default.

Port	Type	Direction	Info
3702	UDP	in & out	WSDD service discovery
443	TCP	in	Device Manager
8031	TCP	in	Installation service (RSI)
8070	TCP	in & out	Maintenance service
8111 – 8114, 8119 8121 - 8124, 8129	TCP	in & out	VDCP over IP
5960 – 5970	TCP	in	Video overlay streaming
30002 – 40001	TCP	in & out	SpycerNet
8011 – 8014, 8019, 8021 – 8024, 8029	TCP	in & out	VENICE web service
30001	UDP	in & out	SpycerNet service discovery
9983	TCP	in & out	SpycerCopy
8010	TCP	in & out	Spycer web service
161 162	UDP	in out	SNMP Traps
8093	TCP	in & out	Workflow engine
4224, 4225	UDP/TCP	in & out	Virtual Storage Access (VSA)
80	TCP	in	iDRAC (DELL management)
25, 587	TCP	out	E-mail notifications
123	UDP	out (& in)	NTP (depending on config.)
53	UDP/TCP	out	DNS
22	TCP	in & out	SSH
137, 138, 139, 445	TCP	in & out	SMB
20, 21	TCP	in & out	FTP
2049, 111	UDP/TCP	in	NFS (Other ports might be required, too)
5353	UDP	in & out	NDI: Service discovery (Multicast, mDNS)
4711 - 4714, 4719 4721 - 4724, 4729	TCP	in & out	NDI: Overlay streaming
5960	TCP	in	NDI: General communication (Stream catalogue)

Network Ports

Port	Type	Direction	Info
5961 - 5968	TCP	in	NDI: Communication One port per overlay channel (in random order, so channel 1 is not always on 5961)
7960	TCP	out	NDI: General communication
7961 - 7968	TCP	out	NDI: Video streaming Server uses these ports to push video to the client

Network Ports

Installation and Configuration

This chapter is divided into the following sections:

Installing the System

Perform the following steps:

1. Unpack the VENICE S system and its accessories.

NOTICE	**Warranty Claims**
	To make warranty claims you have to keep the original packing and use it in case of a return transportation.

---

2. Check your delivery and compare it with the delivery note. In case of missing items, contact your local vendor or Rohde & Schwarz immediately.

⚠ **DANGER**

Source of Danger

Improper handling of the VENICE S can cause substantial damage to personnel and equipment by falling or overturning.

**VENICE S must be lifted and carried by two people on both sides.
It is preferable to use lifting devices and means of transport.
Beware of the crushing hazard when working with heavy loads.**

---

3. Place the system on a firm, flat surface within reach of a power outlet or mount it in a rack. For proper air circulation and cooling make sure the ventilation holes on the rear of the system are not covered.
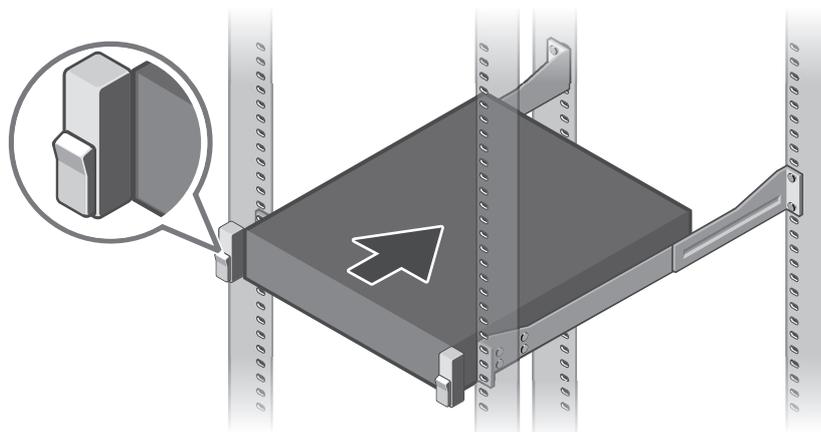
NOTICE   **Environmental Conditions**

For error-free working and a long service life **VENICE S** needs some basic environmental conditions:

- Do not expose VENICE S to sources of heat, such as direct sunlight or a radiator.
- Do not cover or obstruct the ventilation holes of the system. When installing the system in a rack, take care that warmed up air is conducted to the rear of the rack and properly vented away.
- Avoid areas with high humidity or dust. Best operating conditions are given in an air-conditioned site.
- Do not expose VENICE S to strong electric or magnetic fields.
- Avoid areas where VENICE S will be subject to vibrations or shocks.

4. If necessary connect the following computer peripherals:
→ Mouse
→ Keyboard
→ Monitor
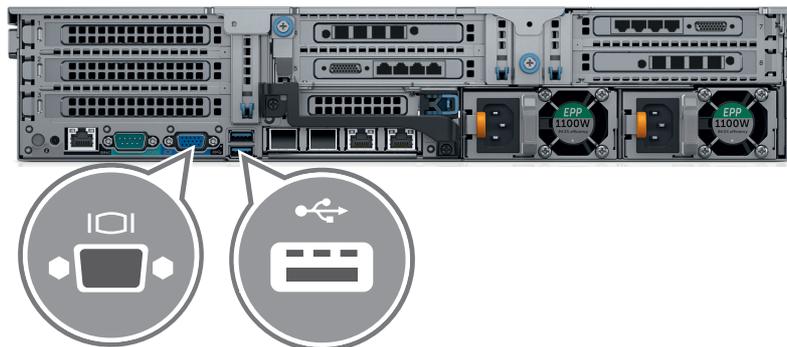
5. Connect the system to a power source.
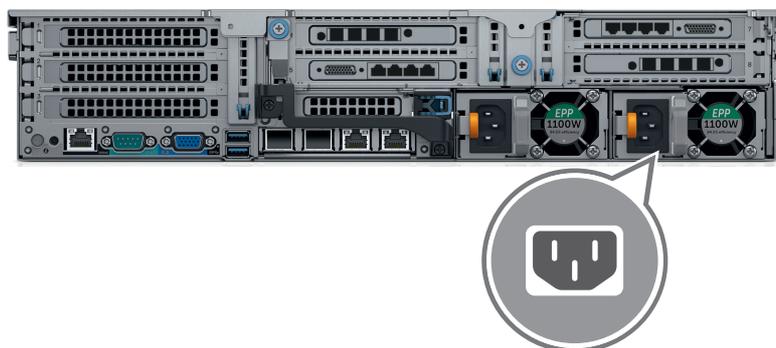
6. Loop and secure the power cable using the retention strap.
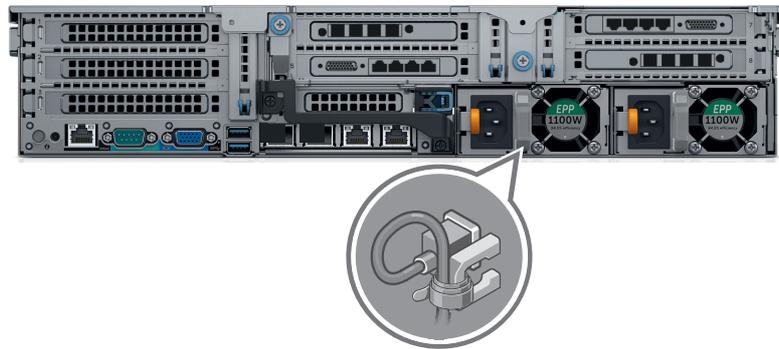
7. Connect a network cable to the Ethernet connector "eno3" or "eno 4"depending on your installation routine. For details see chapter "Network Configuration" on page 63.

▸ With "eno3" the IP address is assigned automatically. With "eno4" the default IP is **10.0.0.8**.

ⓘ　Use only original Rohde & Schwarz certified parts.

8. Insert the supplied SDI SFP coaxial dual transmitter (arrows point outwards) and the SDI SFP coaxial dual receiver (arrows point inwards) into the according SFP+ ports.

SDI In	SDI Out

SDI Out	SDI In
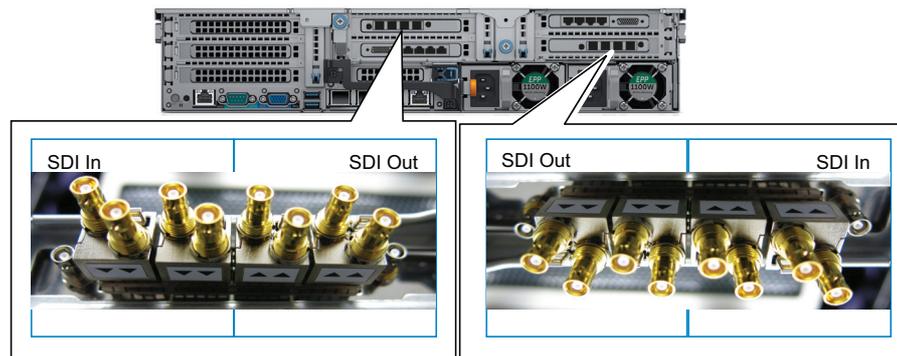
ⓘ　In case you are installing the 12G option, consult also section "Channel Assignment" on page 39 for the correct position of the SFP modules.

9. Connect the HD-BNC to BNC adapter cables to the SDI In/Out connectors.

10. Connect any other peripheral computer and video equipment. An overview of the panels and connectors are listed in chapter "The Rear of the System" on page 34.

VENICE S is ready for first use.The VENICE S hardware is now properly installed and you can switch on the system.

Starting the System

After a proper installation of the system you may start the VENICE S system at any time.

Perform the following steps:

- Press the power switch briefly to turn on the system.
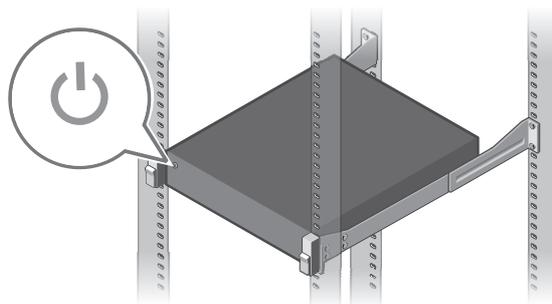
▷ The system will be started. It takes several minutes until the system is fully operational.

For the initial setup the device must be integrated into a network. If the IP of the device is already known a remote SSH terminal (e.g. Putty) can be used to make the basic configuration. Alternatively a monitor and keyboard can be temporarily connected on the front or on the rear of the system. Continue with chapter "Configuring the System" on page 63.

Configuring the System

For the initial setup the device must be integrated into a network.

Network Configuration

There are two ways for the network configuration. You can use a dynamic or a static IP address as described bellow. We recommend to use a static IP for the initial setup.

Using a Static IP

Perform the following steps:

1. Connect your laptop or PC directly to network interface "eno4".

2. Configure your PC's/laptops network interface to a static IP address 10.0.0.x.

3. Open a SSH console to the IP 10.0.0.8.
    ➔ Alternatively you can use a local console with keyboard/mouse.

4. Log in as **root** with the following password: **[serial number of the device]**.

5. Edit the configuration file with:
    vi /etc/sysconfig/network-scripts/ifcfg-eno4

6. Change line **IPADDR=10.0.0.8** into: **IPADDR= your new IP address**

7. Activate the new IP with:
    systemctl restart network

Now VENICE S is ready for integrating the software services.

Using a Dynamic IP

Perform the following steps:

1. Connect a cable from the network interface "eno3".

2. Determine the dynamic IP address with the command:
    ifconfig eno3

Now the dynamic IP address can be used for further configurations.

Integrating Software Service

This setting configures which network interface the software uses for communication. In general this setting is already configured to use the interface "eno3". Only use the following steps if a different configuration is necessary.

Perform the following steps:

* Use the command `fbms-setup.sh -c [interface]` to integrate the software services on the network.
  e.g.: `fbms-setup.sh -c eno4` (It's the most common use to change to port "eno4" for static IP setups.)

After the command is executed the configuration is complete. VENICE S can immediately be operated by remote control from any Windows system connected to the same network.

System Update

There is a factory created base image on the system disks that does not contain the latest VENICE software.

Perform the following steps:

* Follow the steps in chapter "System Update" on page 86.

You are in full operating state now and can configure the VENICE S and change it's operating modes (VDCP, MOS, FIMS) to demo all functionality with the available graphical clients.

Management Tool R&S®Device Manager

As soon as you have the network up and running you can access the R&S®Device Manager from your PC/laptop for all kind of configuration and management. To get access to the R&S®Device Manager you have to enter the previously determined IP address in a standard browser (see chapter "Network Configuration" on page 63).

Shutting Down the System

There are several possibilities to shut down the system. It depends on whether the operating system is already loaded, frozen or not completely loaded. Please act accordingly.

NOTICE   **Re-start**

It takes a while to safely erase all memory banks of the system.

After a shut-down wait at least ten seconds before starting the system again.

Shut Down While Running

Perform the following steps:

● Enter `poweroff` in the command line of the VENICE S.
  ▸ The operating system will save your personal settings and once it has ended, the system will turn off.

System is shut down.

Shut Down With Operating System Frozen or Not Completely Loaded

If the operating system is not responding anymore or not completely loaded, do as follows:

NOTICE   **Corrupted Data**

Shutting down the system while frozen or not completely loaded may lead to corrupted system data.

Use this procedure only if absolutely necessary.

Perform the following steps:

● Shut down the system by pressing the power switch lengthly until the system turns off.

The system is shut down.

Shutting Down the System

Operation

This chapter includes the following section:

- "Operating the System" (page 68)

Operating the System

This section describes how to operate VENICE S.

The following topics are covered:
- "Usable Software and Protocols" (page 68)
- "VENICE UI" (page 68)
- "Playing Content" (page 69)
- "Ingesting Content" (page 69)
- "Transforming Content" (page 70)
- "File Management" (page 70)
- "Configuring VENICE S Services" (page 71)
- "Configuring the Subtitles" (page 74)

Usable Software and Protocols

Module	Software / Protocol	
Ingest	VDCP	RS-422, TCP/IP
	R&S®VENICE UI	
	FIMS capture	SOAP
Playout	VDCP	RS-422, TCP/IP
	R&S®VENICE UI	
	MOS	SOAP
Transform	R&S®VENICE UI	
	FIMS transform	SOAP

VENICE UI

The R&S®VENICE UI software is the operator's interface to the video channels. With it the operator can connect to the server (i.e. to the VENICE server software) via network and allocate one of the video channels to control ingest, playout and transform operations. The R&S®VENICE UI software can be installed on any Windows network client for a remote control of the server. With one instance of the software you can control different video channels of one or more VENICE servers at the same time.

Playing Content

The R&S®VENICE UI Playout Module is the operator's interface to the video channels to play content. With one instance of the software you can control different video channels of one or more VENICE servers at the same time.

In addition VENICE S supports MOS 3.8.4 using SOAP. By implementing MOS, Rohde & Schwarz has opened and simplified the integration of the VENICE S.

Furthermore VENICE S with software is VDCP compliant. This proprietary communications protocol primarily is used in broadcast automation to control broadcast devices, like video servers for broadcast television. The serial communications protocol based on RS-422 is derived from the Sony 9-Pin protocol, an industry-standard protocol for controlling professional broadcast VTRs.

VENICE S uses the tightly coupled primary-secondary methodology of VDCP. The controlling device takes the initiative in communications between the controlling broadcast automation device and the controlled device (video disk). VDCP conforms to the Open Systems Interconnection (OSI) reference model.

For more information see chapter "Configuring VENICE S Services" on page 71 and chapter "Out- or Input of Primary/Secondary Control Signals" on page 37.

Ingesting Content

With R&S®VENICE UI you can connect to the server via network and control single and multi channel ingest operations. With one instance of the software you can control different video channels of one or more VENICE servers at the same time.

Furthermore VENICE S supports FIMS capture using SOAP. Rohde & Schwarz has chosen to implement the FIMS protocol as the primary method by which machines may access their devices and consume their services.

For more information see chapter "Configuring VENICE S Services" on page 71.

Transforming Content

With R&S®VENICE UI it is possible to control transform jobs and you can use FIMS as well. For more information see chapter "Configuring VENICE S Services" on page 71.

File Management

The innovative data and content control software R&S®Spycer allows you to easily maintain transparency and control over video and audio data and their associated metadata. The software offers conclusive rights management, browsing, searching and viewing of video and audio material.

Rohde & Schwarz offers the Spycer functionality also via Spycer web service. For more information see chapter "Configuring VENICE S Services" on page 71.

Configuring VENICE S Services

To use one of the mentioned methods on a VENICE S with you have to activate the respective function in the R&S®Device Manager. For more information about the different web services, VDCP as well as how to integrate and control VENICE S by third-party software see the Software Integration Guide. (available at **https://gloris.rohde-schwarz.com**)

Activating and Launching VDCP

Perform the following steps:

1. Open the R&S®Device Manager on your local system. To get access to the R&S®Device Manager you have to enter the previously determined IP address and the port 3000 in a standard browser.

2. Select the **VENICE MEDIA SERVER** tab.
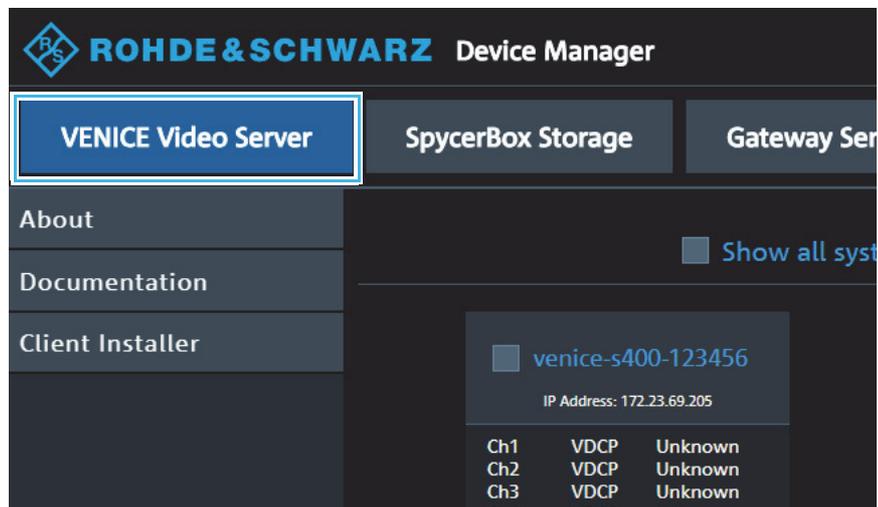
    ▸ The running mode will be indicated in the respective tile in the system view.

3. Select the respective system.
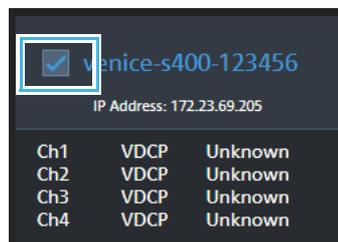
4. If the system runs in another mode than VDCP select the running mode (e.g. FIMS).

5. Click **Disconnect** to make the channel available for the VDCP mode.

6. Select the **VDCP** mode in the **Automation Control** settings.
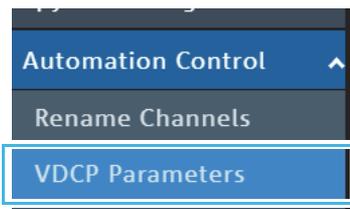
7. Enter a valid **Path** to a local or a central storage for each channel.
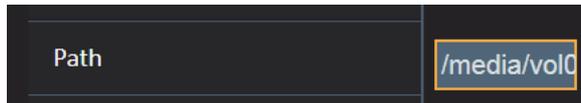
8. Activate **InitiallyLocked** for each channel.
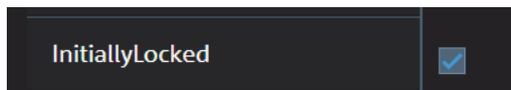
9. Click **Connect** to start the VDCP mode of the respective channel.
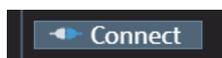
    A successfully started connection of a channel in VDCP mode will be indicated in the system view.

Video Settings

Perform the following steps:

1. Select the **Sync Reference** settings in the **Video Settings**.
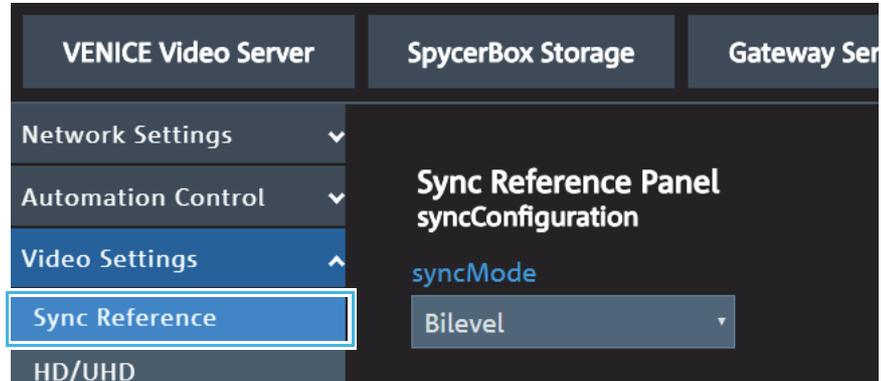
2. Set the **Sync Mode**, the **syncHPhase** and the **syncVPhase** as needed. For detailed information see the documentation of the R&S®Device Manager.
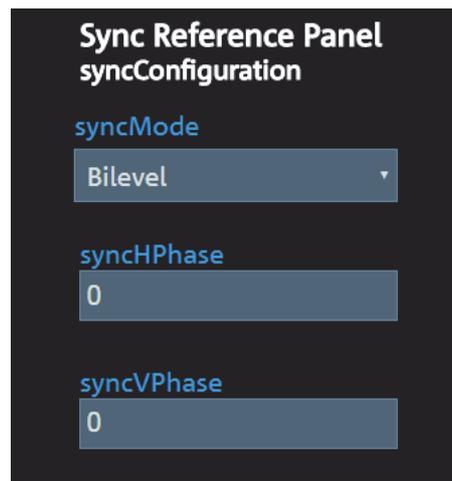
3. Select the **HD/UHD** settings in the **Video Settings**.
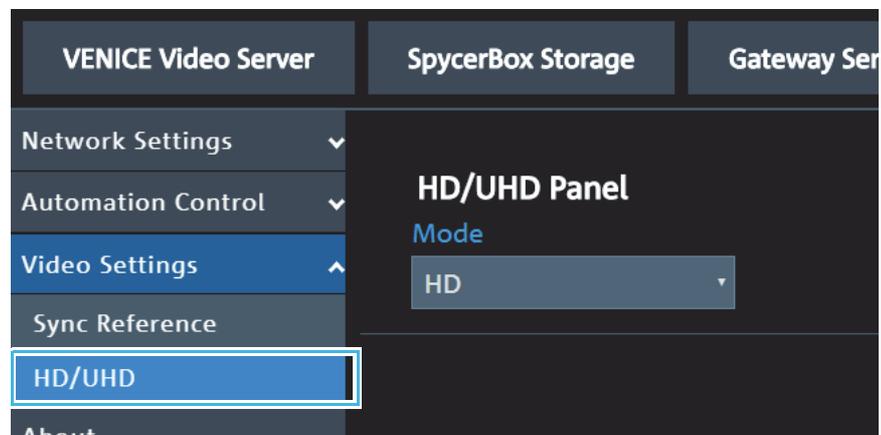
4. Set the **Mode** as needed. For detailed information see the documenta-
   tion of the R&S®Device Manager.
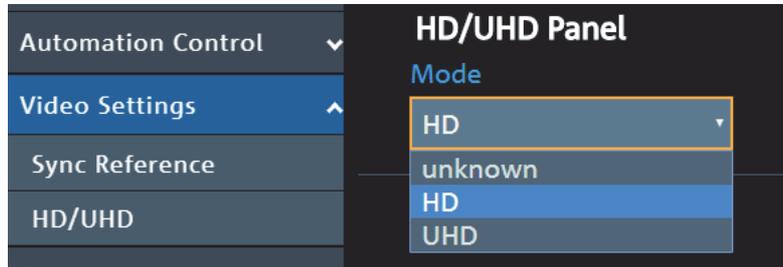
Configuring the Subtitles

This section describes the configuration of subtitles for the VENICE S
system using the R&S®Device Manager.

The following topics are covered:

* Subtitle Configuration in Device Manager (page 74)
* VDCP Subtitle Parameters (page 76)

Subtitle Configuration in Device Manager

To access the subtitle configuration settings in Device Manager, select the
associated system within the Workspace and navigate to "Video Settings" >
"Record" > "Subtitle Configuration".

Subtitle Configuration

Record Subtitle Type	Determines whether subtitle recording is enabled or not (Off) and which type of subtitles (Scc1, Scc3 or Stl) should be recorded.
SCC Start From Mode	Specifies the start mode determination method for SCC: • **StartZero**: Read/Write: SCC files always start at 0. • **ParentTC**: Read/Write: SCC files derive the starting point from the first video TC. • **Guess**: Read: Try to guess whether the SCC file starts with 0 or with the video TC. Write: Same as ParentTC. • **UserDefined**: Read/Write: The start is user-defined.
SCC Drop Frame	Specifies the dropframe-mode determination method for SCC. • **Auto**: SCC files dropframe-mode is determined by the video stream. • **NoneDropFrame**: SCC files are always non-dropframe. • **DropFrame**: SCC files are always dropframe.
Start Frame Number	Determines the frame number of the first video frame calculated from the start time code for SCC and STL.
Start Timecode	STL: Defines the video program start timecode. Only one of startFrameNumber and startTimeCode may be present.
STL Subtitle Page Number	Determines the subtitle page number for STL. Enter a value in the following range: 100-899.
STL GSI Code Page Number	Determines a character code page for the STL GSI block (UnitedStates, Multilingual, Portugal, Canada-French, Nordic).
stlDisplayStandardCode	Determines the display code for STL (OpenSubtitling, Level1, Level2).
stlLanguageCode	Determines the language code for STL. Allowed values are: • 04 (Croatian) • 06 (Czech) • 08 (German) • 09 (English) • 0A (Spanish) • 0C (Estonian) • 0F (French) • 15 (Italian) • 1A (Lithuanian) • 1B (Hungarian) • 20 (Polish) • 21 (Portuguese) • 22 (Romanian) • 24 (Serbian) • 25 (Slovak) • 26 (Slovenian) • 27 (Finnish) • 28 (Swedish) • 29 (Turkish

VDCP Subtitle Parameters

In this dialog you can globally set the directory in which the VENICE S system will look for subtitle files. To access the VDCP Parameters in Device Manager, navigate to "Automation control" > "VDCP Parameters".
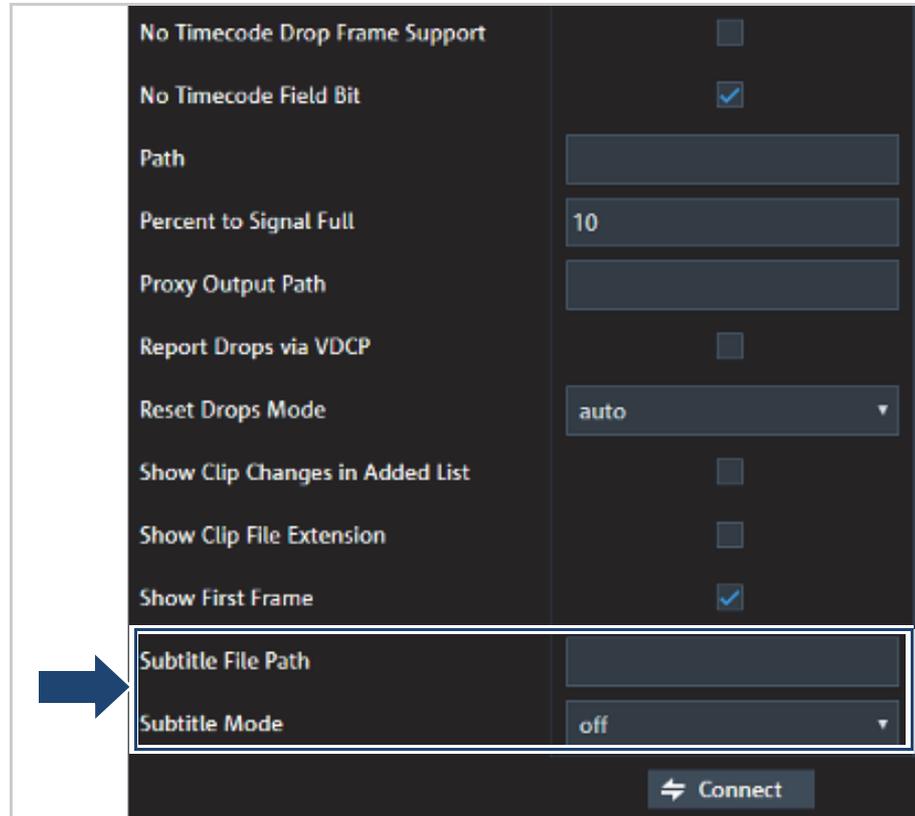
VDCP Subtitle Parameters

Subtitle File Path	Determines the directory where the system looks for subtitle files when 'SubtitleMode' is enabled. If this option is omitted or an empty string is given, the VDCP root directory is used.
Subtitle Mode	Determines whether the system automatically uses subtitle files, if available. • **Off**: No subtitle files are used. • **Auto**: If a supported subtitle file for the clip is present, it will be automatically used.

Administration

This chapter is divided into the following sections:

User Management

To integrate VENICE S into an existing environment it is sometimes neces-
sary to change the file permissions used to write clips.

To achieve this, two things can be done:

- „Changing the User ID"
- „Adding Samba Users"

ⓘ   The steps below are valid for VENICE S with software 3.5 or higher.

Changing the User ID

All the R&S software on a VENICE S runs as user "rsapp", who is in the
group "rsapp". By default user rsapp has the user ID (UID) 1000 and the
rsapp group has group ID (GID) 1000. The steps below describes how to
change that.

Perform the following steps:

1. Ensure that the system is currently not used.

2. Log into the system as root, either directly or via SSH.

3. Stop all R&S processes with:
   /opt/rohde-schwarz/fbms-services.sh stop

4. Query the UID that is currently used by user rsapp with:
   id -u rsapp (By default this should be **1000**.)

5. Query the UID that is currently used by group rsapp with:
   id -g rsapp (By default this should be **1000**.)

6. Modify the UID (e.g. to 1234): **usermod -u 1234 rsapp**
   ▷ If there are still processes running as rsapp, usermod will show an
     error message like this:
     usermod: user rsapp is currently used by process 4224

7. Stop the running processes if necessary.

8. Modify the GID (e.g. to 1234): **groupmod -g 1234 rsapp**

9. Change the ownership of files that belonged to user rsapp, so they
   belong to that user again:
   find / -mount -user 1000 -exec chown -h rsapp {} \;
   ➔ **1000** is the UID that you query in step 4.
   ▷ This only changes the files on the system disk (/). You can run this for
     your storage too, if needed.

10. Change the group affiliation of files that belonged to group rsapp, so they belong to that group again:
`find / -mount -group 1000 -exec chgrp -h rsapp {} \;`
➔ **1000** is the GID that you query in step 4.

> ⓘ Due to the -mount option **`find`** will only change files on the system disk. You can run this for your storage too, if needed.

Adding Samba Users

Perform the following steps:

1. Decide about the name and password for the new account and which group the user should be in. It might be advisable to use the rsapp group, so the user can read clips written by VENICE. The default GID of the rsapp group is 1000.
In this example we will use the name "username" and the GID "1000".

2. Add the account:
`useradd username -g 1000 -N -s /sbin/nologin`

3. Set a password for that user:
`smbpasswd -a username`
▸ You will be prompted for a password.

Creating a Backup Image

The following describes the steps to make a backup image of the system disk and save it to the internal USB flash drive.

Perform the following steps:

1. If appropriate, disconnect all externally connected storage devices from the system.

2. Turn on the VENICE S. At the indicated moment during start-up you have to press **[F11]** to enter the boot menu.
    ▸ The boot menu is displayed on the screen.

3. Select the internally installed USB flash drive as the boot device.

4. Press **[Enter]**.
    ▸ The system will boot from the internal USB flash drive.
    ▸ You will see a window on the screen where you can select the Rohde & Schwarz Rescue environment for loading.

    (i) To complete the loading of the Rohde & Schwarz Rescue environment some user entries are required. For this follow the instructions given on the screen.

    The loading of the environment and the process itself will both try to initialize hardware that may not be present on your system. Any error messages displayed during loading/initialization, e.g. `Failed` or `Warning`, can be disregarded. The backup/recovery process should work nonetheless.

5. Select RuS Rescue and press **[Enter]**.

> (i) If you do not perform any action, RuS Rescue will be loaded automatically after 30 seconds.

▸ Once the loading has finished, you will see the RuS Rescue script with its options on the screen. Your display should look similar to the following:

```
--- RuS Rescue ---

1 - Backup on internal USB device
2 - Restore from internal USB device
3 - Backup on self selected external device
4 - Restore from self selected external device
5 - Reboot the system
6 - Poweroff the system

0 - Exit

Enter selection:
```

6. To create a backup image of your system disk and save it to the internal USB flash drive, press **[1]** and then **[Enter]**.
    ▸ A list of possible source devices will be detailed on the screen. The system disk normally is the 'ATA' disk with, for example, 'sda', 'sdb' or 'sdc' as its device name
    (e.g.: **1:0:0:0   disk   ATA   <device info>   /dev/sda**).

> (i) Ex factory the VENICE S will be delivered with 'sda' as the default system disk. If other configurations have been made later or on customer request, this may be different.

> **NOTICE** **Data Loss**
>
> Selecting the wrong source device may lead to an unwanted configuration and malfunctions when the system is operating.
>
> **Continue with the following steps only if you are able to identify the correct source device.**

7. Enter the name of the system disk: Type in e.g. **sda** (or in other cases **sdb**, **sdc**, etc.) and press **[Enter]**.
    ▸ The system will ask you to enter the image name for the backup image to be saved to the USB flash drive. By entering the name of an already existing backup image you can overwrite it.

8. Type in the name of the image you want to save to the USB flash drive for a later recovery. To confirm your entry press **[Enter]**.
    ▸ The system will ask you to confirm your selection and whether you want to continue:

(i) To abort the process at this point enter **n** for 'no' and press **[Enter]**. You will be redirected to the RuS Rescue script.

After starting the process its termination is no longer possible.

9. To start the backup process type in **y** for 'yes' and press **[Enter]**.
    ▷ The program starts the backup process. Its progress will be indicated on the screen.

(i) The backup process may take some time.

If during the process the screen turns black, press **[Space]** to get it back again.

When the system has finished the backup process, you will be notified about this. Then after pressing **[Enter]**, you will be redirected to the Rohde & Schwarz Rescue script once more where you can choose, for example, 'reboot' or 'poweroff' to restart or turn off the system.

Restoring the System

The following describes the steps to make a recovery of the system disk.

NOTICE **Total Loss of Data**

Selecting the wrong device for restoring the system partition will lead to a total loss of data.

Do not execute any commands if you are not sure about the correct target device.

Perform the following steps:

1. If appropriate, disconnect all externally connected storage devices from the system.

2. Turn on the VENICE S. At the indicated moment during start-up you have to press **[F11]** to enter the boot menu.
   ▸ The boot menu is displayed on the screen.

3. Select the internally installed USB flash drive as the boot device.

4. Press **[Enter]**.
   ▸ The system will boot from the internal USB flash drive. You will see a window on the screen where you can select the Rohde & Schwarz Rescue environment for loading.

   (i) To complete the loading of the Rohde & Schwarz Rescue environment some user entries are required. For this follow the instructions given on the screen.

   The loading of the environment and the process itself will both try to initialize hardware that may not be present on your system. Any error messages displayed during loading/initialization, e.g. `Failed` or `Warning`, can be disregarded. The backup/recovery process should work nonetheless.

5. Select RuS Rescue and press **[Enter]**.

> If you do not perform any action, RuS Rescue will be loaded automatically after 30 seconds.

▶ Once the loading has finished, you will see the Rohde & Schwarz Rescue script with its options on the screen. Your display should look similar to the following:

```
--- RuS Rescue ---

1 - Backup on internal USB device
2 - Restore from internal USB device
3 - Backup on self selected external device
4 - Restore from self selected external device
5 - Reboot the system
6 - Poweroff the system


0 - Exit


Enter selection:
```

6. To restore your system disk from the internal USB flash drive, press **[2]** and then **[Enter]**.
    ▶ A list of possible target devices will be detailed on the screen. The system disk normally is the 'ATA' disk with, for example, 'sda', 'sdb' or 'sdc' as its device name:
    (e.g.: `1:0:0:0   disk   ATA   <device info>   /dev/sda`).

> Ex factory the VENICE S will be delivered with 'sda' as the default system disk. If other configurations have been made later or on customer request, this may be different.

NOTICE   **Data Loss**

A recovery will overwrite all your data.

Continue with the following steps only when you are able to identify the correct target device.

7. Enter the name of the system disk: Type in e.g. **sda** (or in other cases **sdb**, **sdc**, etc.) and press **[Enter]**.
    ▶ A further list of possible source images will be detailed on the screen. If there is only the Rohde & Schwarz recovery image on the USB flash drive, this one will be listed. If there are several images, all images will be displayed.

8. Select the image you want to use for the recovery. Normally, it provides the serial number of the VENICE S in its name. To confirm your choice press **[Enter]**.
    ▶ The system will ask you to confirm your selection and whether you want to continue.

(i) To abort the process at this point enter **n** for 'no' and press **[Enter]** on your keyboard. You will be redirected to the RuS Rescue script.

After starting the process its termination is no longer possible.

9. To start the recovery process type in **y** for 'yes' and press **[Enter]**.
    ▸ The program starts the recovery process. Its progress will be indicated on the screen.

(i) The recovery process may take some time.

If during the process the screen turns black, press **[Space]** to get it back again.

When the system has finished the recovery process, you will be notified. Then after pressing **[Enter]**, you will be redirected to the RuS Rescue script once more where you can choose, for example, 'reboot' or 'poweroff' to restart or turn off the system. The next time the system is started, it will load the restored operating system.

System Update

Rohde & Schwarz delivers system updates in so called RSI's. It is an executable that needs to run on a Windows computer in order to update one or more R&S systems over the network.

In some cases there are three different types of RSI. Please refer to the GLORIS site for your system and download the linked RSI packages. To update a system, all of them have to be installed in this specific order.

- **File system RSI:** contains a new version of the file system, either Spectrum Scale or StorNext.
- **Operating system RSI:** contains fixes and improvements for the CentOS system.
- **Software RSI:** updates the R&S software.

Perform the following steps:

1. Download the last version of the installation package from:
   https://gloris.rohde-schwarz.com

   The installation of RSI packages can only be done on a Windows platform. The respective machine have to be in the same network as the VENICE S.

2. Open the file manager (Windows Explorer).

3. Switch to the directory that contains the installation file.

4. Unzip the installation package.

5. Execute the installation file with a double-click of the mouse.
   ▹ The device list is shown.

6. Select the system you want to install to and start the process by clicking „Install". If your system is not showing up, use the „Options" dialog to enter the VENICE's IP address and hit the „Rescan" button.
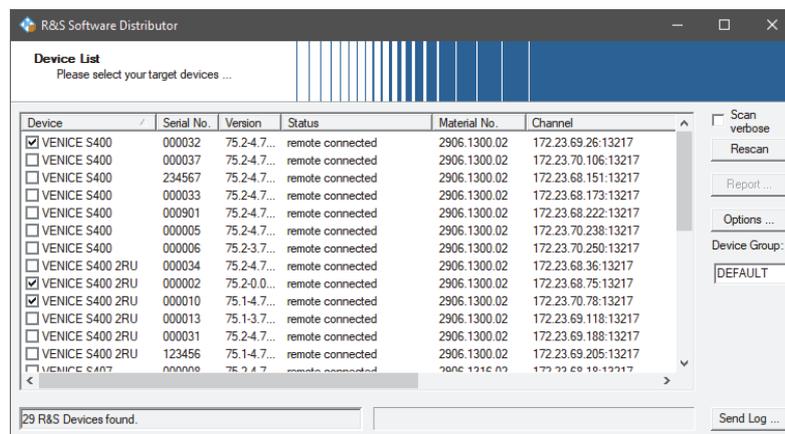
7. Start the installation process by clicking „Install".
    ▶ The installation routine starts and will guide you through the installa-
      tion process.

8. Follow the instructions given on the screen.
    ▶ During the installation procedure all necessary files and libraries will
      be installed on the computer system. The installation will be finished
      as soon as a message reports this.

> (i) Please be aware that the system will automatically reboot within ten
> minutes after the installation of a file system or operating system
> RSI.

> (i) If you did not install the RSI's in the correct order or you missed out
> a previous OS upgrade the system will send „error 34" or „error 37".

9. Shut down the server with the command: `poweroff`

10. Restart the server by pressing the power switch.

After the cold start the system update will be complete and it can be started
at any time.

System Monitoring

The R&S®Device Manager allows you to monitor and query the state of the VENICE S and single parts of the hardware. You will be able to define critical values and configure an e-mail notification as well.

The following parts can be queried:

- Fans
- Disks arrays
- Power supply units
- CPU

Hardware Monitoring through SNMP

The Simple Network Management Protocol (SNMP) is a standard internet protocol for the device management in IP networks. SNMP allows you to e.g. monitor and query the state of several VENICE devices in a network or single parts of the hardware.

VENICE S provides a `StorageManagement-MIB` and `MIB-Dell-10892` that give you the opportunity to query the state of the system or parts of it, using SNMP.

Explanation of the OIDs

(i)   The following applies to software version 4 only.

When using a monitoring software, you will have to enter all OIDs once to be able to monitor the hardware's state continuously.

File	OIDs	Object	Value
MIB-Dell-10892	.1.3.6.1.4.1.674.108 92.1.700.12.1.6.1.1	System Board Fan 1	RPM (Rounds per minute)
	.1.3.6.1.4.1.674.108 92.1.700.12.1.6.1.2	System Board Fan 2	
	.1.3.6.1.4.1.674.108 92.1.700.12.1.6.1.3	System Board Fan 3	
	.1.3.6.1.4.1.674.108 92.1.700.12.1.6.1.4	System Board Fan 4	
	.1.3.6.1.4.1.674.108 92.1.700.12.1.6.1.5	System Board Fan 5	
	.1.3.6.1.4.1.674.108 92.1.700.12.1.6.1.6	System Board Fan 6	
	.1.3.6.1.4.1.674.108 92.1.700.20.1.6.1.1	System Board Inlet Temp	Temperature in °C * 10 [the value needs to be devided by 10, e.g. reading 220 -> 22°C]
	.1.3.6.1.4.1.674.108 92.1.700.20.1.6.1.2	System Board Exhaust Temp	
	.1.3.6.1.4.1.674.108 92.1.700.20.1.6.1.3	CPU1 Temp	
	.1.3.6.1.4.1.674.108 92.1.600.12.1.5.1.1	PS1 Status	other(1), unknown(2), ok(3), nonCritical(4), critical(5), nonRecoverable(6)
	.1.3.6.1.4.1.674.108 92.1.600.12.1.5.1.2	PS2 Status	
Storage Management-MIB	.1.3.6.1.4.1.674.108 93.1.20.140.1.1.4.1	System disk array (array 1)	ready(1), failed(2), online(3), offline(4), degraded(6), verifying(7), resynching(15), regenerating(16), failedRedundancy(18), rebuilding(24), formatting(26), reconstructing(32), initializing(35), backgroundInit(36), permanentlyDegraded(52)
	.1.3.6.1.4.1.674.108 93.1.20.140.1.1.4.2	Meta data disk array (array 2)	
	.1.3.6.1.4.1.674.108 93.1.20.140.1.1.4.3	Log disk array (array 3)	
	.1.3.6.1.4.1.674.108 93.1.20.140.1.1.4.4	Data disk array (array 4) **VENICE S812/824 only**	

SNMP Status Query

Using the SNMP protocol you can query the status of various components and processes. The VENICE S system provides several MIB files from which you can query the status of the associated data points.

Understanding SNMP Naming

The SNMP naming structure contains variable parts (dimensions) which will vary depending on the type of the queried process or the location it is currently running. For example, the [Channel] and the [Stream] variables within the SNMP name `rsSt2110V1SenderAudioCh[Channel]Id[Stream]DummyPackets` will indicate which channel and stream are currently being called up. This variable structure apllies also to the associated object ID of the respective data point.
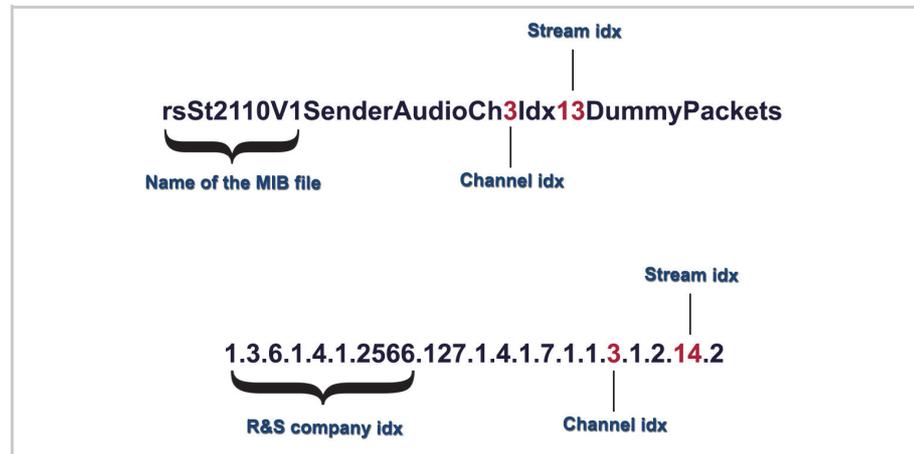
SNMP naming and OID structure

The following values are possible for each of the variables:

- Channel: 1-4, 11-14
  - **Note:** 11-14 means channel 1 to 4 on card 2. Also, index is only used when [Card] is not used
- Card: 1, 2
- Stream:
  - for video: 0
  - for ANC: 0
  - for audio: 0-15 (1-16 in the object ID)
- Storage (A/B): A or B (A and B being redundant storage systems)

To query information of non-SSFS internal VENICE storages use the following SNMP data points:

- HOST-RESOURCES-MIB: data point: hrStorageTable
- UCD-SNMP-MIB: data point dskTable

External SSFS storage information cannot by queried directly via SNMP from VENICE S. If VENICE S is connected to a SpycerNode system, the mounted SSFS storage information can be queried from the following SpycerNode SNMP data points:

- GPFS-MIB: gpfsFileSystemStatusTable

SNMP Data Points

The following table gives a thorough overview over the available MIB files with their data points and more information on the use cases.

Data Point	Dimension	Description	Use Case	SNMP Name
rsVeniceV1MIB (server channel states)				
ChannelMode	Channel, Card	The channel mode of the channel: unknown, VDCP, FIMS, MOS	Validate whether the Venice channel is in the right mode.	rsVeniceV1VideoServer[Channel]ChannelMode
OperationMode	Channel, Card	The operation mode of the channel: unknown, idle, playout, record, transform	Validate whether the Venice channel is performing the correct operation.	rsVeniceV1VideoServer[Channel]OperationMode
VideoDropFrameCount	Channel, Card	Number of video frames dropped on that channel	An increase of that value indicates that video frames have been dropped.	rsVeniceV1VideoServer[Channel]VideoDropFrameCount
AudioDropFrameCount	Channel, Card	Number of audio samples dropped on that channel	An increase of that value indicates that audio samples have been dropped.	rsVeniceV1VideoServer[Channel]AudioDropFrameCount
AncDropFrameCount	Channel, Card	Number of ANC packets dropped on that channel	An increase of that values indicates that ANC packets have been dropped.	rsVeniceV1VideoServer[Channel]AncDropFrameCount
rsPriosBcV1MIB (I/O board status report)				
ExternalVideoSync	Card	Status of the external video sync: unknown, connected, disconnected	Check if the video clock is synchronized to an external clock like BlackBurst or PTP	rsPriosBcV1-Card[Card]ExternalVideoSync

Data Point	Dimension	Description	Use Case	SNMP Name
Name	Card	Name of the installed card: PRIOS_BC	Check which card is installed.	rsPriosBcV1-Card[Card]Name
Variant	Card	Variant of the installed card: string number e.g. "02"	Check the installed variant of the card.	rsPriosBcV1-Card[Card]Variant
SerialNumber	Card	Serial number of the card	Query the serial number of the card for maintenance reasons.	rsPriosBcV1-Card[Card]Serial-Number
SwVersion	Card	Driver version string.	Query the installed driver version for maintenance reasons.	rsPriosBcV1-Card[Card]SwVersion
ProductionDate	Card	Date of production	For maintenance reasons if a specific charge of cards show a specific behavior.	rsPriosBcV1-Card[Card]Produc-tionDate
Manufacturer	Card	Rohde & Schwarz	Query manufacturer name.	rsPriosBcV1-Card[Card]Manufac-turer
PCI	Card	PCI version		rsPriosBcV1-Card[Card]Pci
Temperature1	Card	Temperature on the card in milli grad Celsius: 40000		rsPriosBcV1-Card[Card]Tempera-ture1
Temperature2	Card	Temperature on the card in milli grad Celsius: 40000		rsPriosBcV1-Card[Card]Tempera-ture2
Temperature3	Card	Temperature on the card in milli grad Celsius: 40000		rsPriosBcV1-Card[Card]Tempera-ture3
FanSpeed	Card	Speed of the fan. Value only provided if the card has a fan.		rsPriosBcV1-Card[Card]FanSpeed
TemperatureError	Card	Enumeration that signals an tempera-ture error: ok, fault	Check if temperature limit has been reached.	rsPriosBcV1-Card[Card]Tempera-tureError
FanError	Card	Enumeration that signals an fan error: ok, fault	Same as temperatu-reError	rsPriosBcV1-Card[Card]FanError
PowerError	Card	Enumeration that signals an power error: ok, fault	Same as temperatu-reError	rsPriosBcV1-Card[Card]Power-Error
VideoInput	Channel, Card	Video input status: unknown, detected, notDetected	Check if there is a valid video input signal connected to this channel.	rsPriosBcV1-Card[Card]Channel[Channel]VideoInput

Data Point	Dimension	Description	Use Case	SNMP Name
ExternalVideo-SyncStatus	Channel, Card	Status of the external video sync: unknown, unlocked, locked	If external video sync is used, check if the video channel is locked to the external video clock.	rsPriosBcV1-Card[Card]Channel[Channel]ExternalVideo-SyncStatus
EmbeddedAudio1	Channel, Card	Status of the first four embedded audio channels: unknown, detected, notDetected	Check if all embedded audio channels are connected, e.g. received over SDI.	rsPriosBcV1-Card[Card]Channel[Channel]EmbeddedAudio1
EmbeddedAudio2	Channel, Card		Check if all embedded audio channels are connected, e.g. received over SDI.	rsPriosBcV1-Card[Card]Channel[Channel]EmbeddedAudio2
EmbeddedAudio3	Channel, Card		Check if all embedded audio channels are connected, e.g. received over SDI.	rsPriosBcV1-Card[Card]Channel[Channel]EmbeddedAudio3
EmbeddedAudio4	Channel, Card		Check if all embedded audio channels are connected, e.g. received over SDI.	rsPriosBcV1-Card[Card]Channel[Channel]EmbeddedAudio4
AesAudio1	Channel, Card	Status of the first two AES audio channels: unknown, detected, notDetected	Check if all AES audio channels are connected, e.g. received over SDI.	rsPriosBcV1-Card[Card]Channel[Channel]EmbeddedAudio1
AesAudio2	Channel, Card	Status of the second two AES audio channels: unknown, detected, notDetected	Check if all AES audio channels are connected, e.g. received over SDI.	rsPriosBcV1-Card[Card]Channel[Channel]EmbeddedAudio2
AesAudio3	Channel, Card	Status of the second two AES audio channels: unknown, detected, notDetected	Check if all AES audio channels are connected, e.g. received over SDI.	rsPriosBcV1-Card[Card]Channel[Channel]EmbeddedAudio3
AesAudio4	Channel, Card	Status of the second two AES audio channels: unknown, detected, notDetected	Check if all AES audio channels are connected, e.g. received over SDI.	rsPriosBcV1-Card[Card]Channel[Channel]EmbeddedAudio4
rsSt2110V1MIB (ST2110 video over IP specific information)				
VideoSenderActive	Stream, Channel, (Card included in Channel idx)	Status of the sender: active, inactive	This is always active as the data point is not available if the IP daemon is not running.	rsSt2110V1Sender-VideoCh[Channel]Id[Stream]Active

Data Point	Dimension	Description	Use Case	SNMP Name
VideoSenderRtp-PktCnt	Stream, Channel, (Card included in Channel idx)	Number of RTP Packets send	An increasing count signals that packets have been sent.	rsSt2110V1Sender-VideoCh[Channel]Id[Stream]RtpPktCnt
AudioSenderActive	Stream, Channel, (Card included in Channel idx)	Status of the sender: active, inactive	This is always active as the data point is not available if the IP daemon is not running	rsSt2110V1Sender-AudioCh[Channel]Id[Stream]Active
AudioSenderDum-myPackets	Stream, Channel, (Card included in Channel idx)	Number of dummy packets sent.		rsSt2110V1Sender-AudioCh[Channel]Id[Stream]DummyPackets
AudioSenderFu-tureDropped-Packets	Stream, Channel, (Card included in Channel idx)	Number of packets dropped because they are scheduled in the future.	Number of packets provided too early to the driver.	rsSt2110V1Sender-AudioCh[Channel]Id[Stream]Future-DroppedPackets
AudioSenderPast-DroppedPackets	Stream, Channel, (Card included in Channel idx)	Number of packets dropped because they are in the past.	Number of packets provided too late to the driver.	rsSt2110V1Sender-AudioCh[Channel]Id[Stream]PastDropped-Packets
AudioSenderAll-Packets	Stream, Channel, (Card included in Channel idx)	Number of total packets sent.	If this number increases something has been sent.	rsSt2110V1Sender-AncCh[Channel]Id[Stream]DummyPackets
AncSenderActive	Stream, Channel, (Card included in Channel idx)l	Status of the sender: active, inactive	This is always active as the data point is not available if the IP daemon is not running.	rsSt2110V1Sender-AncCh[Channel]Id[Stream]Active
AncSenderDum-myPackets	Stream, Channel, (Card included in Channel idx)	Number of dummy packets sent.	Number of packets without any content in a drop case.	rsSt2110V1Sender-AncCh[Channel]Id[Stream]DummyPackets
AncSenderFuture-DroppedPackets	Stream, Channel, (Card included in Channel idx)	Number of packets dropped because they are in the future	Number of packets provided too early to the driver.	rsSt2110V1Sender-AncCh[Channel]Id[Stream]FutureDropped-Packets
AncSenderPast-DroppedPackets	Stream, Channel, (Card included in Channel idx)	Number of packets dropped because they are in the past.	Number of packets provided too late to the driver.	rsSt2110V1Sender-AncCh[Channel]Id[Stream]PastDropped-Packets
AncSenderAll-Packets	Stream, Channel, (Card included in Channel idx)	Number of total packets sent.	If this number incre-ments something has been sent.	rsSt2110V1Sender-AncCh[Channel]Id[Stream]AllPackets
VideoReceiverAc-tive	Stream, Channel, (Card included in Channel idx)	Status of the receiver: active, inactive	This is always active as the data point is not available if the IP daemon is not running.	rsSt2110V1Receiver-VideoCh[Channel]Idx[Stream]Active

Data Point	Dimension	Description	Use Case	SNMP Name
VideoReceiverRtp-PktValid	Stream, Channel, (Card included in Channel idx)	Number of valid packets received.	An incrementing count signals that packets have been received.	rsSt2110V1Receiver-VideoCh[Channel]Idx[Stream]RtpPktValid
VideoReceiverRtp-PktUnrecv	Stream, Channel, (Card included in Channel idx)	Unrecoverable packet count increments when a media packet is missing in the channel stream.	An incrementing count signals that packets are missing -> frame/line/pixel drop.	rsSt2110V1Receiver-VideoCh[Channel]Idx[Stream]RtpPktUnrecv
VideoReceiverRtp-PktCorr	Stream, Channel, (Card included in Channel idx)	Corrected packet count increments when a media packet is being recovered in the channel stream.	An increasing count signals that packets could be recovered from received data (leg1 or leg2).	rsSt2110V1Receiver-VideoCh[Channel]Idx[Stream]RtpPktCorr
VideoReceiverRtp-PktDup	Stream, Channel, (Card included in Channel idx)	Duplicated packet count increments when a channel received a media packet that already exists in the media buffer. The count also increases for redundant St2022-7 packets.	An increasing count signals that packages have been received twice. This could indicate that there are multiple streams in the network using the same transport parameters. When St2022-7 is enabled, the packets received on leg 2 are counted as duplicate packets. For St2022-7 this count can be used to validate the quality of the secondary stream. As long as this counter and the VideoReceiverRtpPkt-Valid counter increase with the same paket rate, all packets of the secondary stream have been received.	rsSt2110V1Receiver-VideoCh[Channel]Idx[Stream]RtpPktDup
VideoReceiverRtp-PktCnt	Stream, Channel, (Card included in Channel idx)	Total number of RTP Packets received by the interface.	An incrementing count signals that packets have been received. However, it does not tell anything about the quality of the packets.	rsSt2110V1Receiver-VideoCh[Channel]Idx[Stream]RtpPktCnt

Data Point	Dimension	Description	Use Case	SNMP Name
AudioReceiverActive	Stream, Channel, (Card included in Channel idx)	Status of the receiver: active, inactive	This is always active as the data point is not available if the IP daemon is not running.	rsSt2110V1Receiver-AudioCh[Channel]Idx[Stream]Active
AudioReceiverOutOfOrderPackets	Stream, Channel, (Card included in Channel idx)	The counter increases if the packet queue needs to be reordered because of missing sequence numbers.	Signals gaps in received sequence numbers. Might indicate missing packets or a switch to another sender or stream.	rsSt2110V1Receiver-AudioCh[Channel]Idx[Stream]OutOfOrderPackets
AudioReceiverDroppedPackets	Stream, Channel, (Card included in Channel idx)	Number of dropped packets due to full queue.	An increasing value indicates that incoming packets could not be processed in time. Thus the queue is full and packages need to dropped.	rsSt2110V1Receiver-AudioCh[Channel]Idx[Stream]DroppedPackets
AudioReceiverDuplicates	Stream, Channel, (Card included in Channel idx)	Number of duplicate packets.	An increasing count signals that packages have been received twice. This could indicate that there are multiple streams in the network using the same transport parameters. When St2022-7 is enabled, the packets received on leg 2 are counted as duplicate packets. For St2022-7 this count can be used to validate the quality of the secondary stream. As long as this counter and the VideoReceiverRtpPktValid counter increase with the same paket rate, all packets of the secondary stream have been received.	rsSt2110V1Receiver-AudioCh[Channel]Idx[Stream]Duplicates

Data Point	Dimension	Description	Use Case	SNMP Name
AudioReceiver-ValidPackets	Stream, Channel, (Card included in Channel idx)	Number of valid packets received.	An increasing count signals that correct packets have been received. The received data could still have errors due to missing or corrupted packets.	rsSt2110V1Receiver-AudioCh[Channel]Idx[Stream]ValidPackets
AudioReceiver-MissingPackets	Stream, Channel, (Card included in Channel idx)	Number of missing packets.	An increasing count signals that packets are missing -> samples drop	rsSt2110V1Receiver-AudioCh[Channel]Idx[Stream]Missing-Packets
AudioReceiverReceivedPacketsOn-Leg1	Stream, Channel, (Card included in Channel idx)	Number of pakets received by the interface for leg 1 (primary St2022-7 stream)	An increasing count signals that packets from the primary stream have been received. For St2022-7 this count should increase with the same rate as ReceivedPacketsOn-Leg2.	rsSt2110V1Receiver-AudioCh[Channel]Idx[Stream]Received-PacketsOnLeg1
AudioReceiverReceivedPacketsOn-Leg2	Stream, Channel, (Card included in Channel idx)	Number of pakets received by the interface for leg 2 (secondary St2022-7 stream)	An increasing count signals that packets from the primary stream have been received. For St2022-7 this count should increase with the same rate as ReceivedPacketsOn-Leg1.	rsSt2110V1Receiver-AudioCh[Channel]Idx[Stream]Received-PacketsOnLeg2
AncReceiverActive	Stream, Channel, (Card included in Channel idx)	Status of the receiver: active, inactive	This is always active as the data point is not available if the IP daemon is not running.	rsSt2110V1Receiver-AncCh[Channel]Idx[Stream]Active
AncReceiverOutOfOrderPackets	Stream, Channel, (Card included in Channel idx)	The counter increases if the packet queue needs to be reordered because of missing sequence numbers.	Signals gaps in received sequence numbers. Might indicate missing packets or a switch to another sender or stream.	rsSt2110V1Receiver-AncCh[Channel]Idx[Stream]OutOfOrder-Packets
AncReceiver-DroppedPackets	Stream, Channel, (Card included in Channel idx)	Number of dropped packets due to full queue.	An increasing value indicates that incoming packets could not be processed in time. Thus the queue is full and packages need to dropped.	rsSt2110V1Receiver-AncCh[Channel]Idx[Stream]Dropped-Packets

Data Point	Dimension	Description	Use Case	SNMP Name
AncReceiverDuplicates	Stream, Channel, (Card included in Channel idx)	Number of duplicate packets.	An increasing count signals that packages have been received twice. This could indicate that there are multiple streams in the network using the same transport parameters. When St2022-7 is enabled, the packets received on leg 2 are counted as duplicate packets. For St2022-7 this count can be used to validate the quality of the secondary stream. As long as this counter and the VideoReceiverRtpPkt-Valid counter increase with the same paket rate, all packets of the secondary stream have been received.	rsSt2110V1Receiver-AncCh[Channel]Idx[Stream]Duplicates
AncReceiverValid-Packets	Stream, Channel, (Card included in Channel idx)	Number of valid packets received.	An increasing count signals that correct packets have been received. The received data could still have errors due to missing or corrupted packets.	rsSt2110V1Receiver-AncCh[Channel]Idx[Stream]ValidPackets
AncReceiverMissingPackets	Stream, Channel, (Card included in Channel idx)	Number of missing packets.	An increasing count signals that packets are missing -> drop	rsSt2110V1Receiver-AncCh[Channel]Idx[Stream]MissingPackets
AncReceiverReceivedPacketsOnLeg1	Stream, Channel, (Card included in Channel idx)	Number of pakets received by the interface for leg 1 (primary St2022-7 stream)	An increasing count signals that packets from the primary stream have been received. For St2022-7 this count should increase with the same rate as ReceivedPacketsOnLeg2.	rsSt2110V1Receiver-AncCh[Channel]Idx[Stream]ReceivedPacketsOnLeg1

Data Point	Dimension	Description	Use Case	SNMP Name
AncReceiverRe-ceivedPacketsOn-Leg2	Stream, Channel, (Card included in Channel idx)	Number of pakets received by the inter-face for leg 2 (secondary St2022-7 stream)	An increasing count signals that packets from the primary stream have been received. For St2022-7 this count should increase with the same rate as ReceivedPacketsOn-Leg1.	rsSt2110V1Receiver-AncCh[Channel]Idx[Stream]ReceivedPack-etsOnLeg2
rsVsaV1MIB (virtual storage layer)				
Name	Storage (A/B)	Path of the storage	Query the storage path.	rsVsaS-torage[A/B]Name
UUID	Storage (A/B)	UUID of the storage	Query the storage uuid.	rsVsaS-torage[A/B]Uuid
State	Storage (A/B)	State of the storage: Unknown, Ok, Offline, WriteOnly, QueueFull	Query the storage state.	rsVsaS-torage[A/B]State
rsSyncdV1MIB (internal storage information)				
DaemonState	1	State of the daemon: Undef, Unkonwn, Inprogress, Primary, Secondary	Query the state of the daemon.	rsSyncdV1Daemon-State
SyncState	1	Synchronization status of the daemon: Undef, Idle, Running, Failed	Query the synchroni-zation state.	rsSyncdV1SyncState
SyncElements	1	Number of elements		rsSyncdV1SyncEle-ments
Name	Storage (A/B)	Path of the storage	Query the storage path.	rsSyncd-VStorage[A/B]Name
UUID	Storage (A/B)	UUID of the storage	Query the storage uuid.	rsSyncd-VStorage[A/B]Uuid
State	Storage (A/B)	State of the storage: Undefined, Online, Offline, Inconsistent	Query the storage state	rsSyncd-VStorage[A/B]State
HOST-RESOURCES-MIB (third-party standard library)				
hrStorageTable	Table	Monitoring of storage level for local mount points (no SSFS support) (3rd-party-mib)		hrStorageTable

Data Point	Dimension	Description	Use Case	SNMP Name
UCD-SNMP-MIB (third-party standard library)				
dskTable	Table	Monitoring of storage level for local mount points (no SSFS support) (3rd-party-mib)	The table entries must be added to /etc/snmp/snmpd.conf , e.g. disk /media/vol0 for monitoring the mount point. Traps can also be config-ured that fire if a storage limit has been reached.	dskTable

Integration into an IP Network

This section guides you through the process of transforming VENICE S with SDI support to also support professional video, audio and ancillary data transmission over an IP network.

The following topics are covered

- Preconditions (page 101)
- General Network Settings (page 102)
- Installing the IP Software (page 105)
- Channel Configuration (page 105)
- Activating the SMPTE 2110 IP Interfaces (page 106)
- Configuring the PTP Sync Mode (page 107)
- Configuring the PTP Parameters (page 109)
- Configuring the NMOS Node Settings (page 110)
- NMOS Stream Configuration (page 110)

Preconditions

For the integration into an IP network, VENICE S requires the installation of SFP modules which have to be ordered separately.

Ordering Information

Article name	Article order number	Comments
VEN-B433 VOIP SFP BUNDLE (4X)	2906.1574.02	VENICE S4: 1x needed VENICE S8: 2x needed

VENICE S might be connected with up to three different networks:

- Management network for configuration and video server protocols (VDCP, FIMS, MOS, VeniceWS, WSDD)
- Media over IP network (SMPTE 2110, NMOS)
- **Optional:** Storage network (e.g. SpycerNode)

ⓘ We recommend to use static IP addresses on all required VENICE S network interfaces (no DHCP).

Required Interfaces

Interface	Card [cardIndex]	SMPTE 2110 Port [portIndex]	Model
rsip0s0 (Default 2022-7 main interface)	0	0	VENICE S4/S8
rsip0s1 (Default 2022-7 secondary interface)		1	
rsip0s2		2	
rsip0s3		3	
rsip1s0 (Default 2022-7 main interface)	1	0	VENICE S8 only
rsip1s1 (Default 2022-7 secondary interface)		1	
rsip1s2		2	
rsip1s3		3	

General Network Settings

For the initial configuration of the IP settings, a client PC is required that is directly connected to the default 1G configuration network interface "eno4" on the VENICE S server (factory default: static IP 10.0.0.8). The corresponding client PC's network port needs to be configured to an IP address that is in the same network (e.g. 10.0.0.9).

Configuring the IP interfaces

If the VENICE S server already got a dedicated management network IP configured on one of the two available 1G network interfaces ("eno3" or "eno4"), just use that port for the network settings configuration.

Perform the following steps:

1. Open the R&S®Device Manager in your Chrome browser by using the management network interface IP address.

2. Log in to the Device Manager web frontend:
   username: **administrator**; password: **[serial number of the device]**
   With version 1.0.0.0 to 1.5.1.0 use password **admin**.

3. Click the **VENICE MEDIA SERVER** tab in the "Device Manager" section and select the corresponding VENICE server.
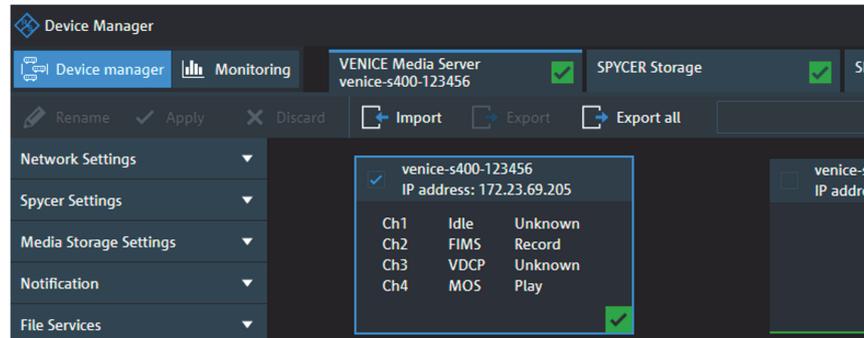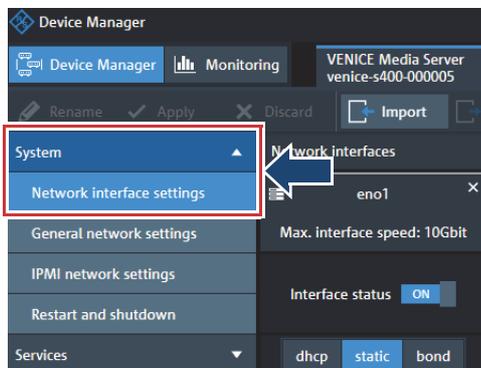

4. Navigate to **System > Network interface settings**.

5. Configure all IP interfaces for all used networks

IP interfaces

Port	Network Interface	Comments
eno1	Storage	optional
eno3	Management	required
rsip[cardIndex]s[portIndex] See also Required Interfaces in "Precondi- tions" (page 101)	Media over IP	required

Default Gateway and DNS Server

Perform the following steps:

1. Select **General Network Settings** in the **System** settings.

2. Configure the default gateway and DNS server (Name Server 1 - 3) addresses as needed.
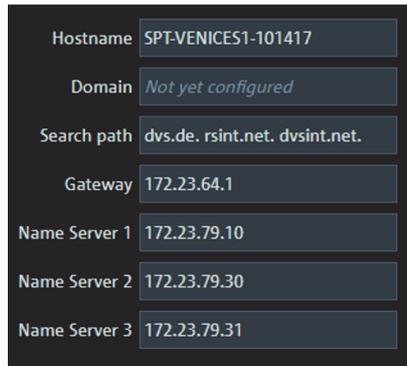
IPMI Settings

ⓘ   We recommend a static network configuration.

Perform the following steps:

*   Configure the IPMI management interface network settings.
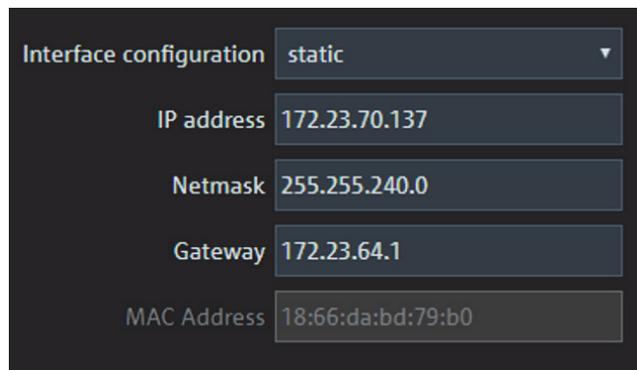
Installing the IP Software

Perform the following steps:

1. Download the latest RSI release package from GLORIS
   `https://gloris.rohde-schwarz.com`

2. Start the RSI executable on your Windows client PC that is connected to the same management network the VENICE S is connected to.

3. Click through the installation menu until you can select servers.

4. Select all VENICE S servers you want to update and start the installation.

(i) If the firmware of the server's video I/O card was changed, the server will be automatically cold rebooted.

Channel Configuration

Perform the following steps:

1. Open the R&S®Device Manager as described in "Configuring the IP interfaces" (page 102) and select the corresponding video server.

2. Navigate to **Video settings > HD/UHD**.

3. Select **SMPTE2110HD** or **SMPTE2110UHD** as mode for all available cards.
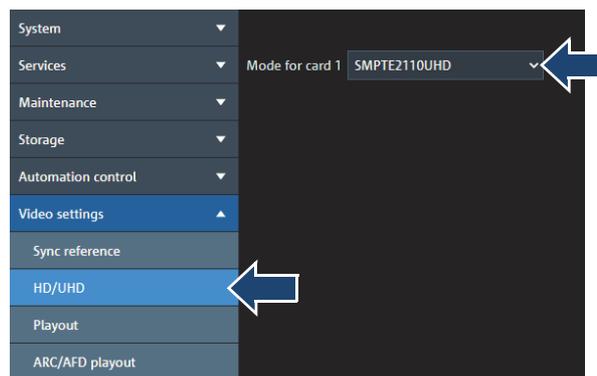
4. Press Apply to confirm your settings.

(i) This triggers a restart of the VENICE S server.

Activating the SMPTE 2110 IP Interfaces

Perform the following steps:

1. Open the R&S®Device Manager as described in "Configuring the IP interfaces" (page 102) and select the corresponding video server.

2. Navigate to **System > Network interface settings**.

3. Switch **INTERFACE STATUS** to **ON** for all required interfaces, see also "Preconditions" (page 101) for the required interfaces.
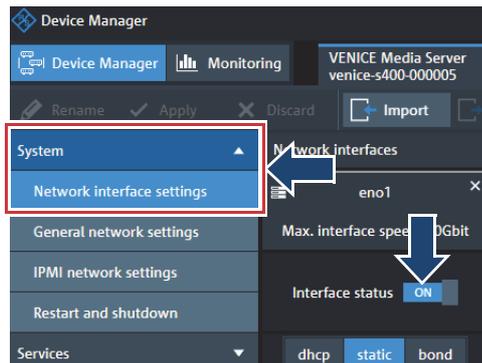
4. Configure static or DHCP settings.

5. Press **Apply** to confirm your settings.

6. Each time you change the network settings the network service is restarted on the associated device. Press OK to confirm the warning message.
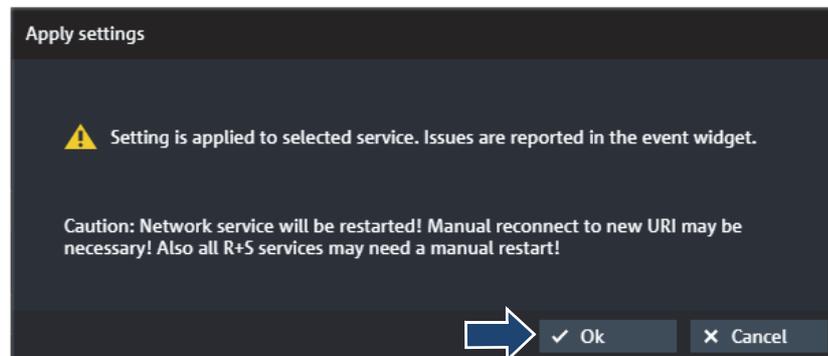
Configuring the PTP Sync Mode

The PTP sync mode can be configured either through the R&S®Device Manager or via the VENICE Web Service (VeniceWS)

Using the R&S®Device Manager

Perform the following steps:

1. Open the R&S®Device Manager as described in "Configuring the IP interfaces" (page 102) and select the corresponding video server.

2. Navigate to **Video Settings> Sync Reference**.

ⓘ The **Sync Reference** panel will be displayed only if all channels of the selected VENICE S are set to IDLE UNKNOWN state, which requires them to be disconnected from current service. If the panel is displayed in your case, proceed directly with step 4, otherwise first perform step 3.

3. **(Optional)** To disconnect the channels, do the following:
   → Navigate to **Automation control** and check which service is started on each channel. You may have to click through each of the parameters sections (VDCP, FIMS or MOS) to locate the channel and the running service.
   → For each running channel click the **Disconnect** button.
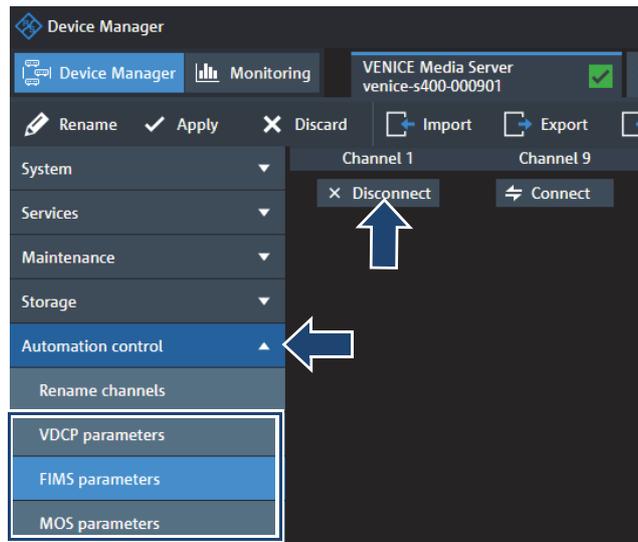
4. In the Sync Reference panel set CURRENT CHANNEL to **1**.

5. Select SYNC CONFIGURATION and set SYNC MODE to **PTP**.
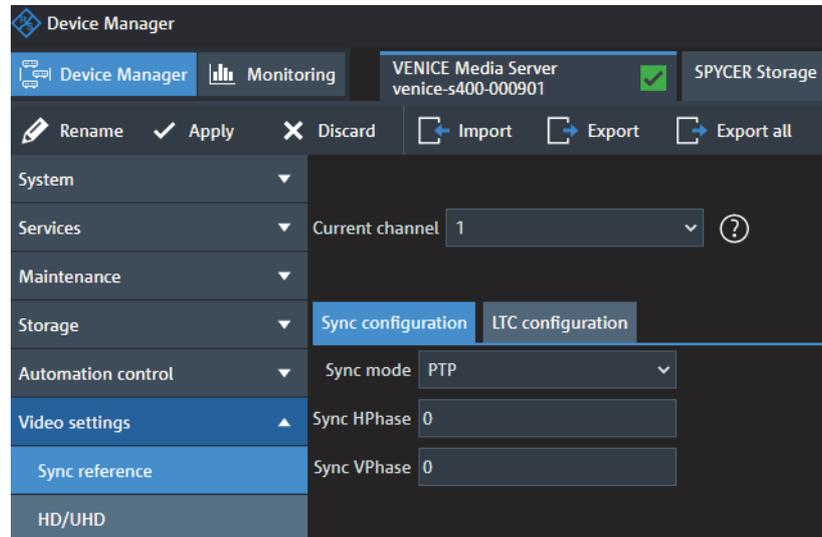
6. Repeat steps 4 and 5 with CURRENT CHANNEL being set to **11**.

7. Press **Apply** to confirm your settings.

Using the VENICE Web Service (VeniceWS)

Perform the following steps:

1. Use the VeniceWS SOAP request **querySyncConfigurationRequest** to check if VENICE S uses PTP synchronization mode. Send the following command to **[Management-IP]:8011** and **[Management-IP]:8021**:

```
<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:urn="urn:rus:webservices:venice">
   <soapenv:Header/>
   <soapenv:Body>
      <urn:querySyncConfigurationRequest/>
   </soapenv:Body>
</soapenv:Envelope>
```

2. Set VENICE S to PTP clock synchronization mode with the VeniceWS
    SOAP request **configureSyncRequest**. Send the following request to
    [Management-IP]:8011 and **[Management-IP]:8021**:

```
<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:urn="urn:rus:webservices:venice">
<soapenv:Header/>
    <soapenv:Body>
        <urn:configureSyncRequest>
            <urn:syncConfiguration>
                <!--Optional:-->
                <urn:syncMode>PTP</urn:syncMode>
                <urn:syncHPhase>0</urn:syncHPhase>
                <urn:syncVPhase>0</urn:syncVPhase>
            </urn:syncConfiguration>
        <!--Optional:-->
        </urn:configureSyncRequest>
    </soapenv:Body>
</soapenv:Envelope>
```

Configuring the PTP Parameters

ⓘ Both interfaces rsipXs1 and rsipXs0 of the corresponding card X need to be
enabled even if only one interface is connected to the network. Otherwise
PTP will not work correctly after reboot. See also "Activating the SMPTE 2110
IP Interfaces" (page 106) for activation instructions.

Perform the following steps:

1. Open the R&S®Device Manager as described in "Configuring the IP
    interfaces" (page 102) and select the corresponding video server.

2. Navigate to **Services > PTP settings**.

3. Determine the defaults for your specific PTP environment.

4. Press **Apply** to confirm your settings.

ⓘ This panel also contains PTP status monitoring information for one card of
VENICE S4 and two cards of VENICE S8.

Configuring the NMOS Node Settings

Configuration of NMOS node settings is available via the R&S®Device Manager.

Perform the following steps:

1. Open the R&S®Device Manager as described in "Configuring the IP interfaces" (page 102) and select the corresponding video server.

2. Navigate to **Video settings > Global NMOS settings.**

3. Set the corresponding values for VENICE S:
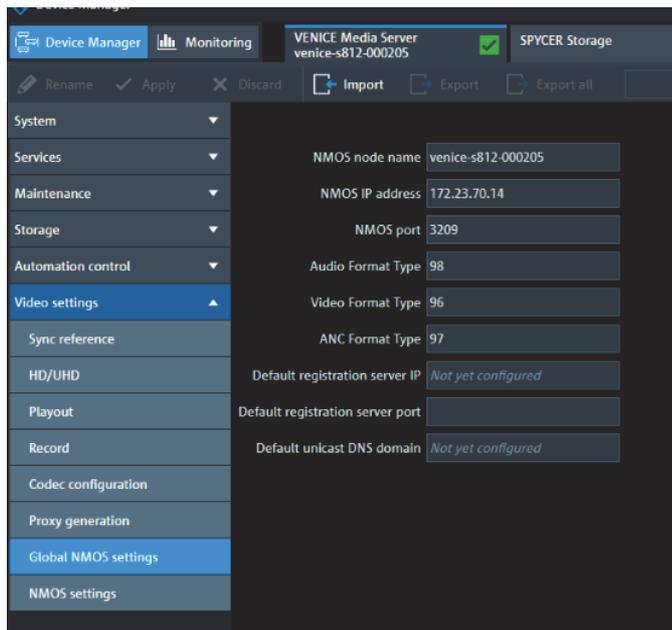
> The last three settings at the bottom are intended for unicast based registration servers.There is no need to specify those settings if a multicast based registration server is used.

NMOS Stream Configuration

Instead of one SDI input port and one SDI output port for video, audio and ANC I/O, the IP VENICE provides NMOS resources for sending and receiving IP streams over one channel. In contrast to SDI, specific NMOS sender and receiver resources need to be configured separately for each data type, such as audio, video and ANC. These recourses are prepared externally as JSON files which are then imported using the Device Manager interface.

There can also be multiple instances of NMOS resources of the same data type. VENICE S currently supports one video sender and receiver, one ANC sender and receiver and up to 16 audio senders and receivers per channel.

NMOS Settings   Perform the following steps:

1. In the Device Manager select the requested VENICE server and navigate to **Video settings > NMOS settings**.
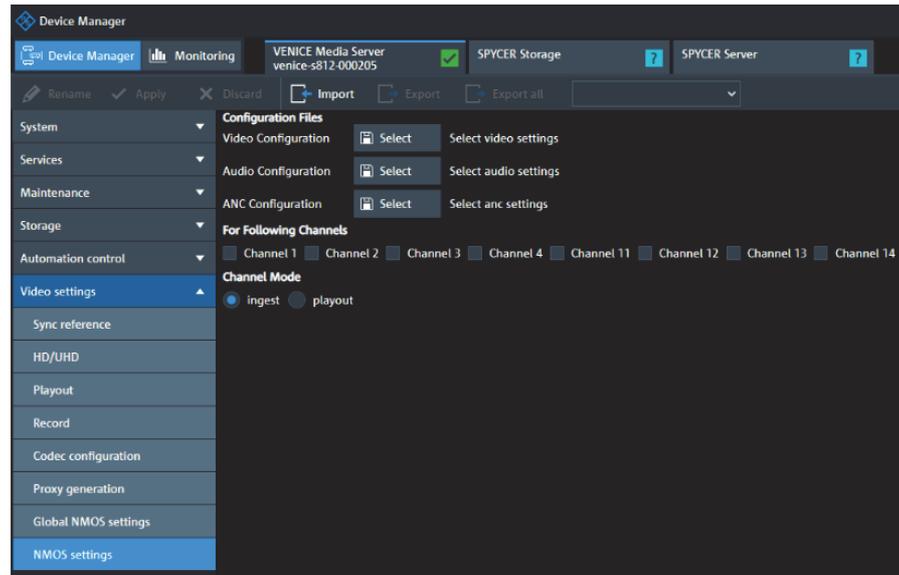
2. Import the JSON files with the NMOS configuration settings. There is one JSON file per data type, operation mode (playout or ingest), and channel.
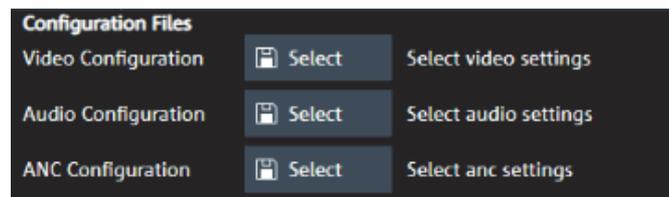
💡 Please note that it is a good practice to include at least the channel index and maybe the name of the NMOS Node into the name of the resource. This simplifies the assignment of the stream to the corresponding channel.

3. Select the associated channel.

ⓘ Channels 11,12,13,14 are available for the second video card (VENICE S8 only).

4. Select the channel mode (ingest or playout).
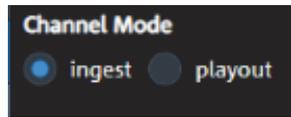
ⓘ   If the configuration file for a specific combination is missing or invalid, VENICE S automatically creates default resources. The NMOS name of those resources starts with the string `Default`.

The next sections provide detailed information about the structure and parameters of the audio, video and ANC configuration files.

Video Configu-ration   The following section provides a small example and also lists the entire JSON schema for video configuration.

ⓘ   The name scheme may change due to version control.

Example for video configuration:

```
{

    "nmosResourceName": "VeniceVideoChannel01",

    "usesSt2022-7": true,

    "deviceIPs": ["192.168.1.1", "192.168.1.2"],

    "multicastIPs": ["232.20.1.1", "232.20.1.2"],

    "multicastPorts": [50000, 50100],

    "videoColorimetry": "BT601",

    "transferCharacteristicSystem": "HLG"

}
```

Parameters "deviceIPs", "multicastIPs", "multicastPorts", "videoColorimetry", and "transferCharacteristicSystem" are optional.

Complete JSON Schema for video configuration:

```
{
        "$schema": "http://json-schema.org/schema#",
        "type": "object",
        "properties": {
                "nmosResourceName": {
                        "description": "Name of the NMOS
resource. Changes result in different NMOS resource IDs.",
                        "type": "string",
                        "default": "VeniceChannel"
                },
                "usesSt2022-7": {
                        "description": "Enable seamless
protection switching for the video NMOS resource.",
                        "type": "boolean",
                        "default": true
                },
                "deviceIPs": {
                        "type": ["array", "null"],
                        "minItems": 1,
                        "maxItems": 2,
                        "items": {
                                "type": "string",
                                "format": "ipv4"
                        }
                },
                "format": "ipv4"
                }
                },
                "multicastPorts": {
                        "type": ["array", "null"],
                        "minItems": 1,
                        "maxItems": 2,
                        "items": {
                                "type": "string",
                                "format": "ipv4"
                        }
                },
```

```json
            "multicastIPs": {
                    "type": ["array", "null"],
                    "minItems": 1,
                    "maxItems": 2,
                    "items": {
                            "type": "string",
                            "format": "ipv4"
                    }
            },
            "multicastPorts": {
                    "type": ["array", "null"],
                    "minItems": 1,
                    "maxItems": 2,
                    "items": {
                            "type": "integer",
                            "minimum": 1,
                            "maximum": 65535
                    }
            },
            "videoColorimetry": {
                    "type": "string",
                    "enum": [
                            "BT601",
                            "BT709",
                            "BT2020",
                            "BT2100",
                            "ST2065_1",
                            "ST2065_3",
                            "UNSPECIFIED",
                            "XYZ"
                    ]
            },
            "transferCharacteristicSystem": {
                    "type": "string",
                    "enum": [
                            "SDR",
                            "PQ",
                            "HLG",
                            "LINEAR",
```

```
                            "BT2100LINHLG",

                            "ST2065_1",

                            "ST428_1",

                            "DENSITY",

                            "UNSPECIFIED"

                ]

            }

    },

    "required": [

            "nmosResourceName",

            "usesSt2022-7"

    ],

    "additionalProperties": false

}
```

ANC Configu-   The following section provides a small example and also lists the entire
ration   JSON schema for ANC configuration.

ⓘ   The name scheme may change due to version control.

Example for ANC configuration:

```
{

    "nmosResourceName": "VeniceAncChannel01",

    "usesSt2022-7": true,

    "deviceIPs": ["192.168.1.1", "192.168.1.2"],

    "multicastIPs": ["232.20.1.1", "232.20.1.2"],

    "multicastPorts": [50000, 50100]

}
```

Parameters "deviceIPs", "multicastIPs", and "multicastPorts" are optional.

Complete JSON Schema for ANC configuration:

```json
{
        ""$schema": "http://json-schema.org/schema#",
        "type": "object",
        "properties": {
                "nmosResourceName": {
                        "description": "Name of the NMOS
resource. Changes result in different NMOS resource IDs.",
                        "type": "string",
                        "default": "VeniceChannel"
                },
                "usesSt2022-7": {
                        "description": "Enable seamless
protection switching for the video NMOS resource.",
                        "type": "boolean",
                        "default": true
                },
                "deviceIPs": {
                        "type": ["array", "null"],
                        "minItems": 1,
                        "maxItems": 2,
                        "items": {
                                "type": "string",
                                "format": "ipv4"
                        }
                },
                "multicastIPs": {
                        "type": ["array", "null"],
                        "minItems": 1,
                        "maxItems": 2,
                        "items": {
                                "type": "string",
                                "format": "ipv4"
                        }
                },
                "multicastPorts": {
                        "type": ["array", "null"],
                        "minItems": 1,
                        "maxItems": 2,
                        "items": {
```

```
                        "type": "integer",
                        "minimum": 1,
                        "maximum": 65535
                }
            }
    },
    "required": [
            "nmosResourceName",
            "usesSt2022-7"
    ],
    "additionalProperties": false
}
```

Audio Configu-   The JSON audio (routing) schema used by VENICE S defines the structure
ration   of the audio configuration JSON file. It specifies a list of up to 16 audio
                      streams. Beside the name of the stream and the use of ST2022-7, each
                      audio stream comprises a stream index, the number of audio channels,
                      audio labels, audio symbols, and audio routings.

Example for the configuration of one stereo audio stream:

```json
{
    "audioStreams": [
        {
            "channels": 2,
            "index": 0,
            "labels": [
                "Left german",
                "Right german"
            ],
            "name": "Audio01-Channel01",
            "routing": [
                {
                    "bufferChannelIndex": 0,
                    "streamChannelIndex": 0
                },
                {
                    "bufferChannelIndex": 1,
                    "streamChannelIndex": 1
                }
            ],
            "symbols": [
                "L",
                "R"
            ],
            "usesSt2022-7": true,
            "deviceIPs": [
                "192.168.1.1",
                "192.168.1.2"
            ],
            "multicastIPs": [
                "232.20.1.1",
                "232.20.1.2"
            ],
            "multicastPorts": [
                50000,
                50100
            ]
        }
```

Parameters "symbols", "usesSt2022-7", "deviceIPs", "multicastIPs", and "multicastPorts" are optional.

`bufferChannelIndex`	The index of the internal audio channel from zero to 15.
`streamChannelIndex`	The index of the audio channel of the stream from zero to number of channels minus one.

Ingest:

For ingest, the `streamChannelIndex` is routed to the `bufferChannelIndex` where the `bufferChannelIndex` needs to be unique over all defined streams.

Playout:

For playout, the `bufferChannelIndex` is routed to the `streamChannelIndex` where the `streamChannelIndex` needs to be unique within each audio stream. Without the restrictions, two outputs would be mapped to the same input, which would require a mixing of the audio signals, which is not implemented so far.

ⓘ Note that senders originally provide a stream with number of channels as de-fined by the parameter `channels`. However, receivers can also be connected to senders with a different number of channels. For receivers, the parameter `channels` defines the number of audio channels routed into the recorded file. If the number of received audio channels is greater than the number of chan-nels of the stream, only the first number of `channels` is routed to the file. If the number of received channels is smaller, the missing channels contain zero samples.

Complete JSON Schema for audio configuration:

```
{
        "$schema": "http://json-schema.org/schema#",
        "definitions": {
                "multiAudioStreamMapping": {
                        "type": "object",
                        "required": [
                                "streamChannelIndex",
                                "bufferChannelIndex"
                        ],
                        "additionalProperties": false,
                        "properties": {
                                "streamChannelIndex": {
                                        "type": "integer",
                                        "minimum": 0,
                                        "maximum": 7
                                },
                                "bufferChannelIndex": {
                                        "type": "integer",
                                        "minimum": 0,
                                        "maximum": 15
                                }
                        }
                },
                "audioStream": {
                        "type": "object",
                        "required": [
                                "index",
                                "name",
                                "channels",
                                "routing",
                                "labels"
                        ],
                        "additionalProperties": false,
                        "properties": {
                                "index": {
                                        "type": "integer",
                                        "minimum": 0,
                                        "maximum": 15
```

```
            },
            "name": {
                    "type": "string"
            },
            "usesSt2022-7": {
                    "description": "Enable
seamless protection switching for this stream.",
                    "type": ["boolean", "null"],
                    "default": true
            },
            "deviceIPs": {
                    "type": ["array", "null"],
                    "minItems": 1,
                    "maxItems": 2,
                    "items": {
                            "type": "string",
                            "format": "ipv4"
                    }
            },
            "multicastIPs": {
                    "type": ["array", "null"],
                    "minItems": 1,
                    "maxItems": 2,
                    "items": {
                            "type": "string",
                            "format": "ipv4"
                    }
            },
            "multicastPorts": {
                    "type": ["array", "null"],
                    "minItems": 1,
                    "maxItems": 2,
                    "items": {
                            "type": "integer",
                            "minimum": 1,
                            "maximum": 65535
                    }
            },
            "channels": {
```

```
                        "type": "integer",
                        "minimum": 1,
                        "maximum": 8
                },
                "routing": {
                        "type": "array",
                        "minItems": 1,
                        "maxItems": 8,
                        "items": {
                                "$ref":
"#/definitions/multiAudioStreamMapping"
                        }
                },
                "labels": {
                        "type": "array",
                        "items": {
                                "description": "Label
for this channel (free text)",
                                "type": "string"
                        }
                },
                "symbols": {
                        "type": ["array", "null"],
                        "items": {
                                "description":
"Symbol for this channel (from VSF TR-03 Appendix A)",
                                "type": "string",
                                "oneOf": [
                                        {
                                        "enum":      [
                                                "L",
                                                "R",
                                                "C",
                                                "LFE",
                                                "Ls",
                                                "Rs",
                                                "Lss",
                                                "Rss",
                                                "Lrs",
                                                "Rrs"
```

```
                                                    "S"
                                                    ]
                                                },
                                                {

"pattern": "^NSC(00[1-9]|0[1-9][0-9]|1[0-1][0-9]|12[0-7])$",

"description": "Numbered Source Channel"
                                                },
                                                {

"pattern": "^U(0[1-9]|[1-5][0-9]|6[0-4])$",

"description": "Undefined channel"
                                                }
                                            ]
                                        }
                                    }
                                }
                            }
                        },
                    "description": "List of IP audio routing
configurations per stream.",
                    "type": "object",
                    "properties": {
                            "audioStreams": {
                                    "type": "array",
                                    "minItems": 1,
                                    "maxItems": 16,
                                    "items": {
                                            "$ref":
"#/definitions/audioStream"
                                    }
                            }
                    },
                    "required": [
                            "audioStreams"
                    ],
                    "additionalProperties": false
}
```

Maintenance

This chapter is divided into the following sections:

Safety Instructions

⚠ WARNING

Risk of Injury

Lifting heavy systems can lead to serious injury.

Do not attempt to lift the system by yourself. Whenever you need to lift the system, get others to assist you.

⚠ WARNING

Electric Shock

Opening or removing the system cover while the system is powered on may expose you to a risk of electric shock.

Don't open or remove the system while the system is powered on.

NOTICE

System Damage

Operating the system without the system cover can result in component damage.

Do not operate the system without the cover for a duration exceeding five minutes.

⚠ CAUTION

Warranty Claims

Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Rohde & Schwarz is not covered by your warranty.

Read and follow the safety instructions that are shipped with your product.

NOTICE

Electrostatic Discharge (ESD)

Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed.

Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the system. Avoid touching the internal components of the computer system and the video board whenever possible.

NOTICE	**Proper Operation and Cooling**
	To ensure proper operation and cooling, all bays in the system and system fans must be populated always with either a component or a plate.
	Install a component or a plate if necessary.

Removing and Mounting the System Cover

Removing the System Cover

Requirements: ✓ Follow the safety guidelines listed in chapter "Safety Instructions" on page 126 and chapter "Safety" on page 9.

                   ✓ If installed, remove the front plate.

                   ✓ If applicable, remove the system from the rack.

Perform the following steps:

1. Rotate the latch release lock counter clockwise to the unlocked position.

2. Lift the latch toward the back of the system.
   The system cover slides back and the tabs on the system cover disengage from the slots on the chassis.
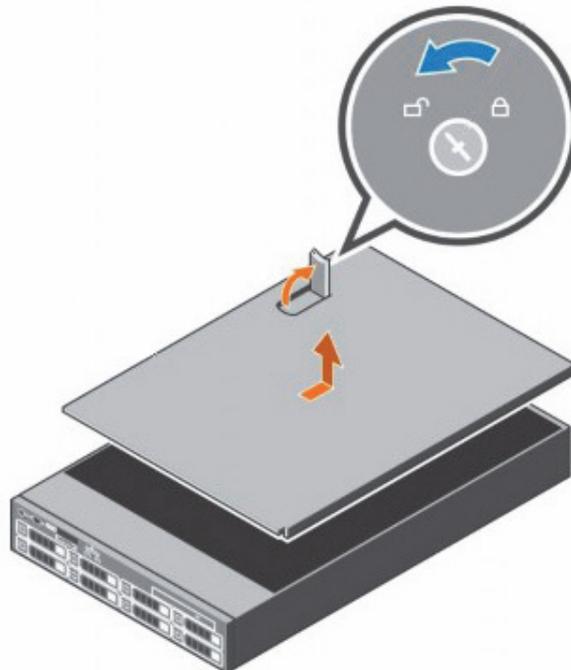
ⓘ   The position of the latch may vary depending on the configuration of your system.

3. Hold the cover on both sides, and lift the cover away from the system.

Installing the System Cover

Requirements: ✓ Follow the safety guidelines listed in chapter "Safety Instructions" on page 126 and chapter "Safety" on page 9.

          ✓ Ensure that all internal cables are connected and placed out of the way and no tools or extra parts are left inside the system.

Perform the following steps:

1. Align the slots on the system cover with the tabs on the chassis.

2. Push the system cover latch down to move the system cover into the closed position.
   ▸ The system cover slides forward and the tabs on the system cover engage with the slots on the chassis. The system cover latch locks into place when the system cover engages with the slots on the chassis.

3. Rotate the latch release lock clockwise to the locked position.
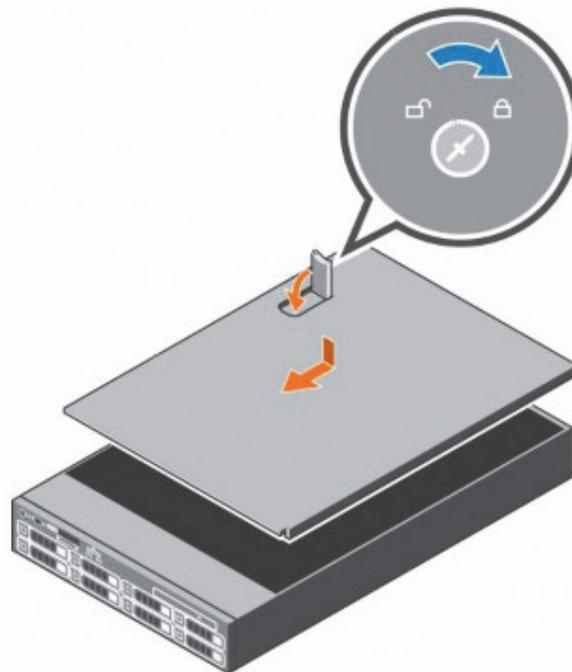
4. If applicable, install the system into the rack.

5. If removed, install the front plate.

6. Reconnect the peripherals and connect the system to the electrical outlet.

7. Turn on the system, including any attached peripherals.

Replacing a Power Supply Unit

⚠ **CAUTION**	**PSU Mismatch Conditions**
	Mixing PSUs from previous generations of systems can result in a PSU mismatch condition or failure to turn on.
	If two PSUs are used, they must be of the same maximum output power. **For AC PSUs, use only PSUs with the Extended Power Performance (EPP) label on the back.**

⚠ **CAUTION**	**Data Loss**
	The system needs one power supply for normal operation.
	On power-redundant systems, remove and replace only one power supply at a time in a system that is powered on.

ⓘ You may have to unlatch and lift the optional cable management arm if it interferes with power supply removal.

Requirements:
- ✓ Follow the safety guidelines listed in chapter "Safety Instructions" on page 126 and chapter "Safety" on page 9.
- ✓ If installed, remove the front plate.
- ✓ If applicable, remove the system from the rack.
- ✓ Verify that both PSUs are of the same type and have the same maximum output power, that is listed on the PSU label (shown in watts).

Perform the following steps:

1. Disconnect the power wires from the power source and the connector from the PSU you intend to remove.

2. Press the release latch and slide the PSU out of the chassis by using the PSU handle.
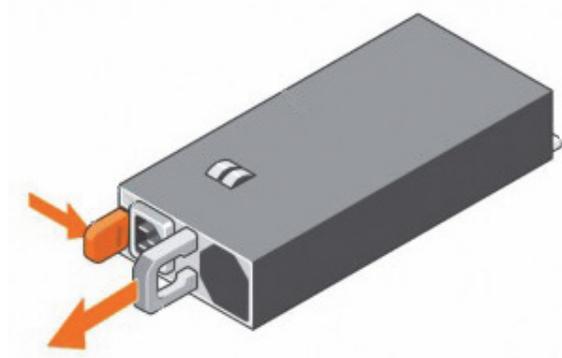
3. Slide the new PSU into the chassis until the PSU is fully seated and the release latch snaps into place.
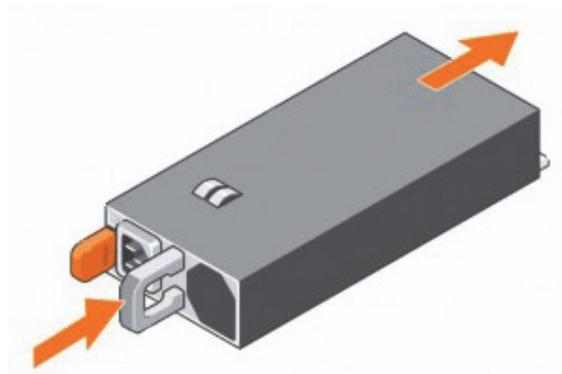
4. If you have unlatched the cable management arm, relatch it.

5. Connect the power cable to the PSU and plug the cable into a power outlet.

> ⓘ When installing, hot-swapping, or hot-adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU status indicator turns green to signify that the PSU is functioning properly.

6. Secure the cable with the strap.

7. If applicable, install the system into the rack.

8. If removed, install the front plate.

Replacing a Hot Swappable Hard Drive

Requirements: ✓ Follow the safety guidelines listed in chapter "Safety Instructions" on
                    page 126 and chapter "Safety" on page 9.
                  ✓ If installed, remove the front plate.

Perform the following steps:

1. Press the release button to open the hard drive carrier release handle.
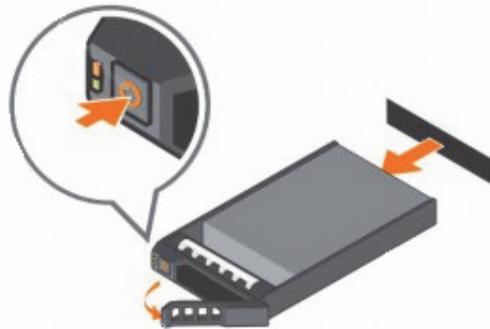
2. Slide the hard drive out of the hard drive slot.
   ➔ If you are not replacing the hard drive immediately, insert a hard drive
     blank in the empty hard drive slot.

NOTICE	**Cooling Problems**
	To maintain proper system cooling, all empty hard drive slots must have hard drive blanks installed.
	Install a hard drive blank if necessary.

NOTICE	**Data Loss**
	Using not tested hard drives can result in loss of data.
	Use only hard drives that have been tested and approved for use with the hard drive backplane.

NOTICE	**Damaged Carrier**
	Inserting a hard drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.
	When installing a hard drive, ensure that the adjacent drives are fully installed.

NOTICE **Data Loss**

When a replacement hot swappable hard drive is installed and the system is powered on, the hard drive automatically begins to rebuild. Any data on the replacement hard drive is immediately lost after the hard drive is installed.

Make absolutely sure that the replacement hard drive is blank or contains data that you wish to have over-written.

Combining SAS and SATA hard drives in the same RAID volume is not supported.

3. Install a hard drive in the hard drive carrier.

4. Press the release button on the front of the hard drive carrier and open the hard drive carrier handle.

5. Insert the hard drive carrier into the hard drive slot until the carrier connects with the backplane.
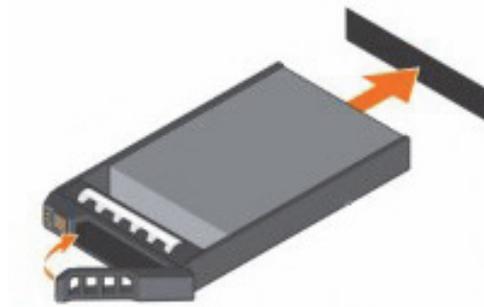
6. Close the hard drive carrier handle to lock the hard drive in place.

7. Turn on the hard drive.

8. If removed, install the front plate.

Replacing a Cooling Fan Assembly

Requirements: ✓ Follow the safety guidelines listed in chapter "Safety Instructions" on page 126 and chapter "Safety" on page 9.

✓ If installed, remove the front plate.

✓ If applicable, remove the system from the rack.

✓ Remove the system cover as described in chapter "Removing the System Cover" on page 128.

Perform the following steps:

1. Unlock the cooling fan assembly from the chassis by lifting the release levers.

2. Lift the cooling fan assembly out of the chassis.
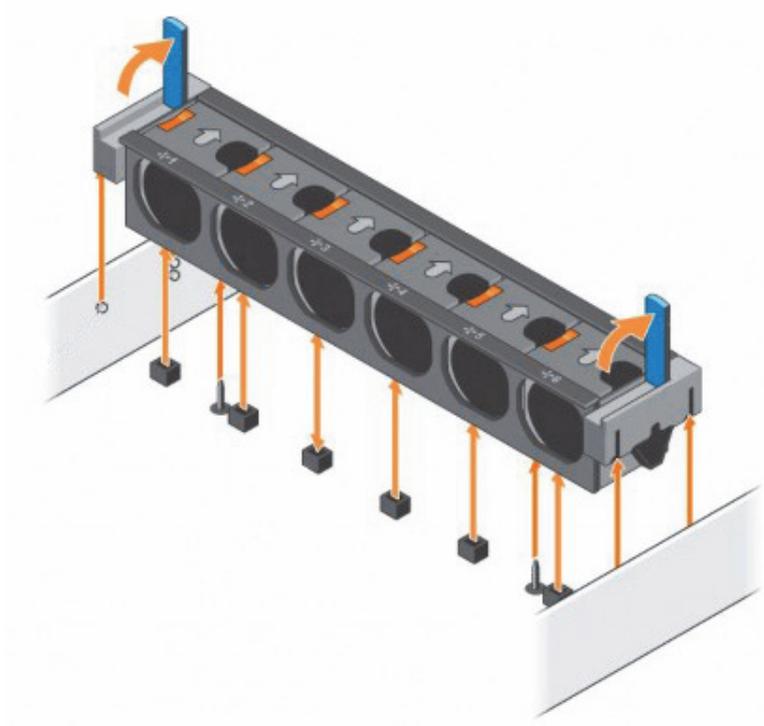
3. Align the slots on the cooling fan assembly with the guide pins on the chassis.

4. Slide the new cooling fan assembly into the chassis.

5. Lock the new cooling fan assembly into the chassis by lowering the release levers until firmly seated.
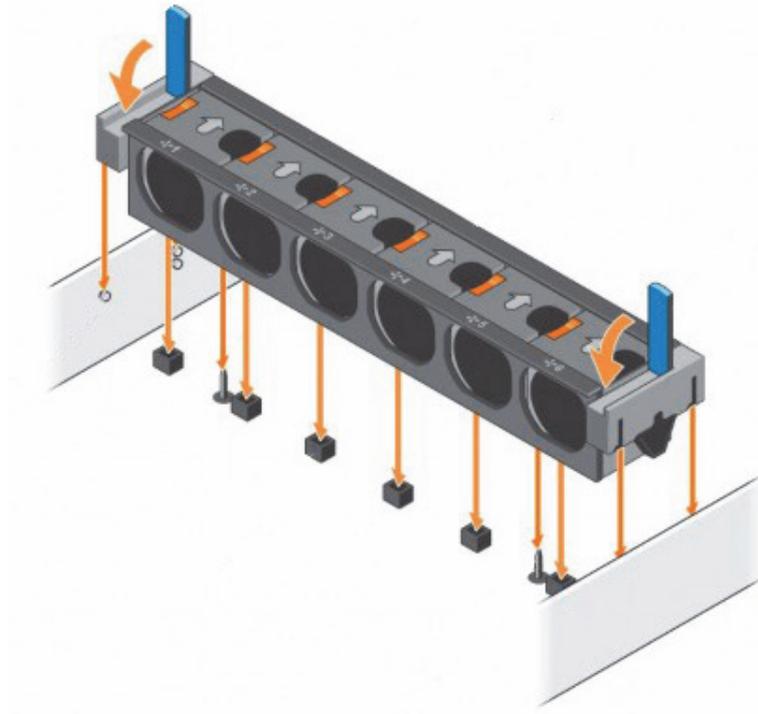
6. If removed, install the front plate.

7. Install the system cover as described in chapter "Installing the System Cover" on page 129.

Replacing a Cooling Fan

Requirements: ✓ Follow the safety guidelines listed in chapter "Safety Instructions" on page 126 and chapter "Safety" on page 9.
                  ✓ If installed, remove the front plate.
                  ✓ If applicable, remove the system from the rack.
                  ✓ Remove the system cover as described in chapter "Removing the System Cover" on page 128.

⚠ **CAUTION**	**Cooling Problems** The cooling fans are hot-swappable, but to maintain proper cooling while the system is on, it is important to replace only one fan at a time. **Replace only one fan at a time.**

Replacing a Cooling Fan Assembly

Perform the following steps:

1. Press the fan release tab and lift the cooling fan out of the cooling fan assembly.
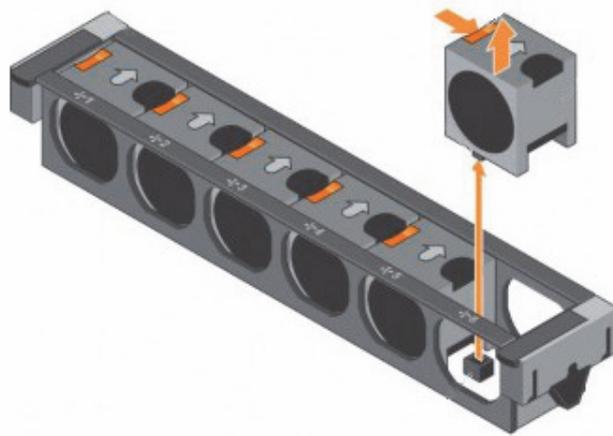
2. Align the connector at the base of the cooling fan with the connector on the system board.

3. Slide the new cooling fan into the securing slot until the tab locks into place.
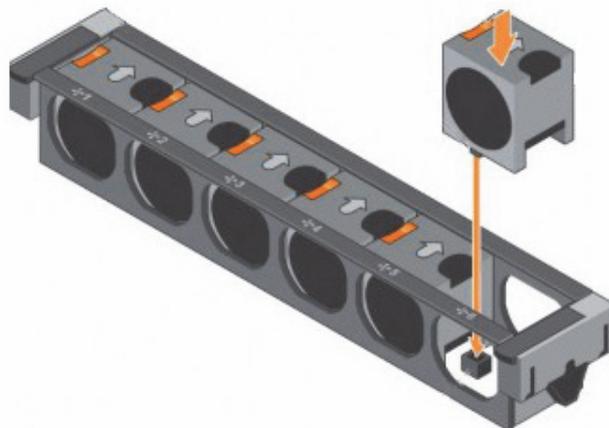
4. If applicable, install the system into the rack.

5. If removed, install the front plate.

6. Install the system cover as described in chapter "Installing the System Cover" on page 129.

Replacing the Internal USB Memory Key

Requirements: ✓ Follow the safety guidelines listed in chapter "Safety Instructions" on page 126 and chapter "Safety" on page 9.

✓ If installed, remove the front plate.

✓ If applicable, remove the system from the rack.

✓ Remove the system cover as described in chapter "Removing the System Cover" on page 128.

Perform the following steps:

1. Remove the USB memory key from the USB port.
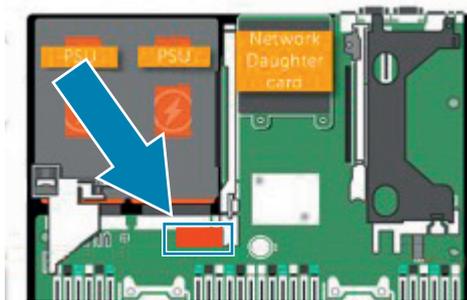
2. Insert the replacement USB memory key into the USB port.

3. If applicable, install the system into the rack.

4. If removed, install the front plate.

5. While booting, press **[F2]** to enter System Setup and verify that the system detects the USB memory key.

6. Install the system cover as described in chapter "Installing the System Cover" on page 129.

Replacing the Internal USB Memory Key

Replacing the Internal USB Memory Key

Working with the R&S Installer (RSI)

The Rohde & Schwarz Installer (RSI) is used to install the entire software environment required to operate R&S systems. The RSI is an executable that needs to run on a computer with a Windows operating system in order to update one or more R&S systems over the network.

This chapter is divided into the following sections:

- Types of RSI Packages (page 140)
- Using an RSI (page 141)
- RSI Troubleshooting (page 143)

Types of RSI Packages

There are currently three different types of RSI packages. Please refer to the GLORIS site for your system at **https://gloris.rohde-schwarz.com** and download the linked RSI packages.

When updating a system, the RSI packages have to be installed in the following specific order according to their type:

1 **File system RSI**. This contains a new version of the file system, either Spectrum Scale or StorNext.
2 **Operating system RSI**. This contains fixes and improvements for the CentOS system.
3 **Software RSI**. This updates the R&S software such as R&S®VENICE and R&S®Spycer.

Please be aware that the system will automatically reboot within ten minutes after the installation of a file system or operating system RSI.

Using an RSI

The RSI package is a Windows executable that can remotely update R&S systems in the network.

(i) Always make sure to install the RSI packages in the correct order according to their type, see "Types of RSI Packages" (page 140).

Perform the following steps:

1. On a Windows system, start the installer with a double click.
   ▸ First, the version information of the current installer is provided.
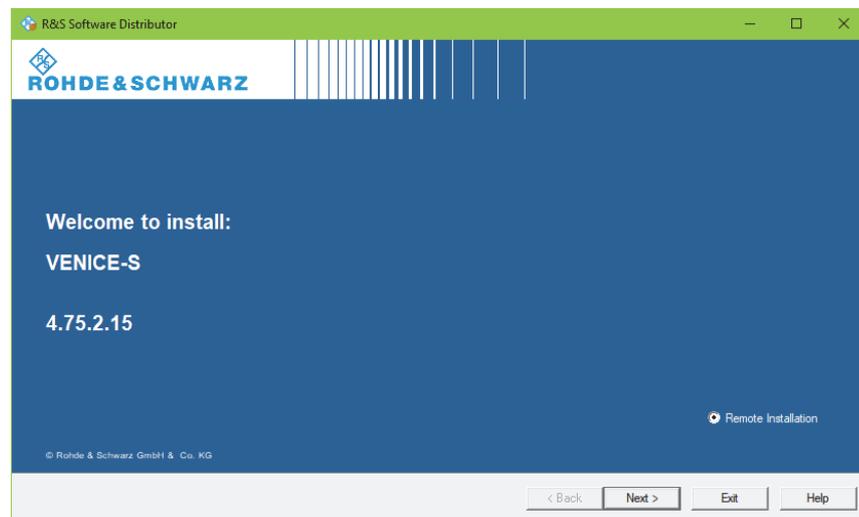
2. Click the **Next** button.
   ▸ The installer will list all software (operating system, drivers and tools) which will be updated.
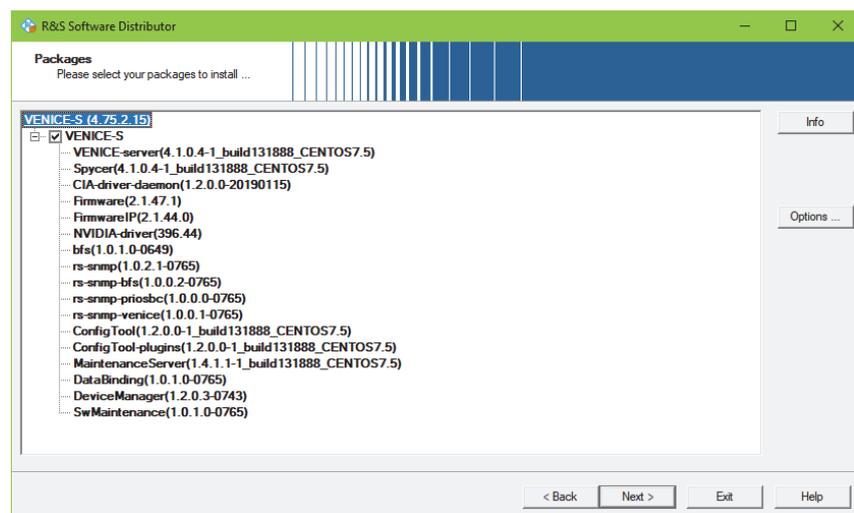
3. Click **Next** to proceed to the next section.

  ▸ A list is shown with all newer R&S systems detected in the network. In the first column, you can select one or more systems to be updated.
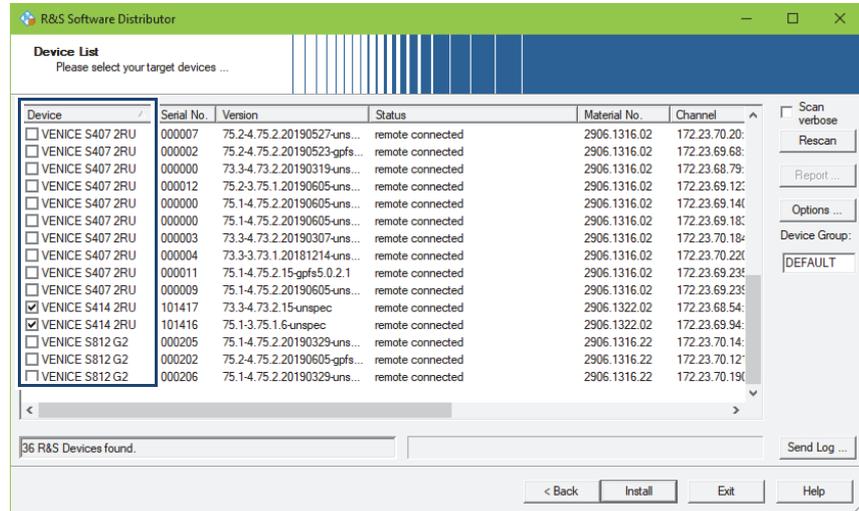
4. Click **Install** to start the installation. The current status will be shown in the Status column.

(i) Please be aware that the system will automatically reboot within ten minutes after the installation of a file system or operating system RSI.

RSI Troubleshooting

This section provides information on what to do in case an RSI installation fails.

Logs

Logs of the installation process are created on the systems involved. The logs are located under **/var/log/rohde-schwarz/swupdate/rsi-installer_<YYYY-MM-DD>__<HH-MM-SS>.txt**.

Error Codes

If errors occur during the installation, the RSI will show error codes displayed on the monitor, without having to open the log files. Some errors can be rectified on site while others require to contact the R&S support department for assistance. If the latter is the case, please provide the code number of the error(s) in question.

Error code	Message	Description & possible solution
5	Installer already running!	-
30	Failed unpacking Windows client installers!	Disk volume is full or installation packages are defective.
31	Failed importing new packages!	Disk volume is full or installation packages are defective.
32	Failed updating!	Disk volume is full or installation packages are defective.
33	Failed installing meta package!	The meta package of the product is defective or required packages are missing.
34	Image version is 'X', must be at least 'Y'!	Operating system image is not compatible with the RSI. Possible cause is the attempt to install a new RSI on an obsolete/outdated image.
35	Machine UUID '/etc/opt/rohde-schwarz/machine-uuid' is missing!	Installation failed on the system. Try executing fbms-setup.sh.
36	System configuration '/etc/opt/rohde-schwarz/swupdate.conf' is missing!	Installation failed on the system. Try executing fbms-setup.sh.

Error code	Message	Description & possible solution
37	This RSI is for CentOS 'X', but this system is running 'Y'!	The CentOS version of the system is not compatible with the RSI. Either update the system or use an appropriate RSI.
38	Package 'zvbi' is not installed. Please contact the support!	The 'zvbi' package has to be installed manually. Please contact R&S support department.
39	NVIDIA driver 'X' is missing!	Please contact R&S support department.
40	Failed installing NVIDIA driver!	More details can be found in the log file on the system. Please contact R&S support department.
41	Failed configuring NVIDIA driver!	nvidia-smi -e 0 command has failed. Call up the command in a shell, gather the information details and contact R&S support department.
42	zip_unpack() failed: argument missing (1: X, 2: Y)	Not enough parameters for the internal RSI execution. Please contact R&S support department.
43	Failed unpacking ZIP file!	Unpacking process failed. More details can be found in the log file on the system. Please contact R&S support department.
44	Needed hotfix is missing!	More details can be found in the log file on the system. Please contact R&S support department.
45	The new version is older than the currently installed version!	A downgrade to an older version is not possible.
46	Unpacking tar.gz archives failed!	Unpacking the (rus-configd-plugins|rus-extra).tar.gz archive has failed. Please contact R&S support department.
47	CentOS version is 'X', but must be at least 'Y'!	CentOS version is outdated. Upgrade first the operating system.

Error code	Message	Description & possible solution
48	CentOS version is 'X', but must be lower than 'Y'!	The newer CentOS version is not compatible with this outdated RSI. Use a newer RSI version.
49	Please perform a manual downgrade before installing this version!	A downgrade is required. All packages must be uninstalled using '/opt/rohde-schwarz/fbms-uninstall.sh uninstall'

Transport

This chapter includes the following sections:

- "Safety Notes" (page 148)
- "Packing the System" (page 149)

Safety Notes

VENICE S is a very sensitive device. Handle it with great care. Especially the disks of the system must be handled with great care.

	Fragile. Avoid shocks or vibrations. For longer distances use a lifting device.
	Keep dry.

⚠ DANGER

Risk of injury while handling component with heavy weight

Improper handling of the VENICE S can cause substantial damage to personnel and equipment by falling or overturning.

VENICE S must be lifted and carried by two people on both sides. It is preferable to use lifting devices and means of transport. Beware of the crushing hazard when working with heavy loads.

Packing the System

Perform the following steps:

NOTICE **Transportation Damage**

Warranty will be void if not using the original packing for transportation.

Keep the original packing and use it in case of transportation. If you do not have the original packing anymore, use a similar structured packing for transportation. **Rohde & Schwarz** cannot be held liable for transportation damages.

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1. Wrap the video system in foil.
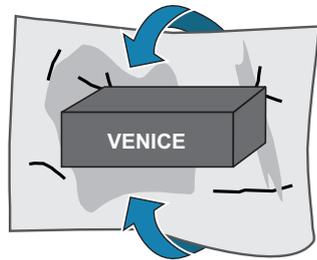
2. Pack the video system in box A with foam.
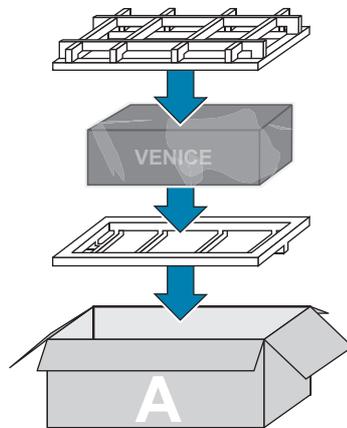
Packing the System

3. Pack the accessories.
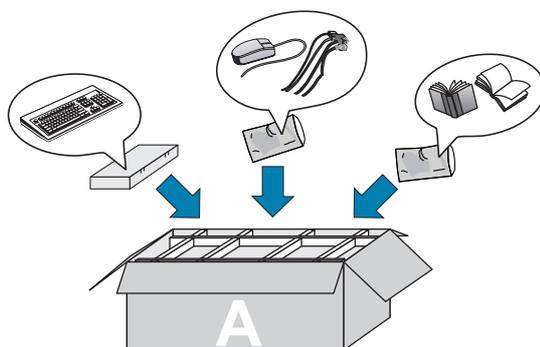
4. Add filling material so that the contents of your package are unable to move around inside the box.

5. Close box A.
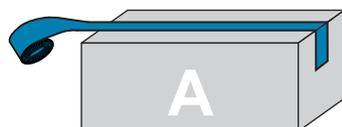
The system has been packed.

Troubleshooting

This chapter includes the following section:

- "Safety First - For you and your System" (page 152)
- "Troubleshooting External Connections" (page 153)
- "Troubleshooting the Video Subsystem" (page 154)
- "Troubleshooting a USB Device" (page 155)
- "Troubleshooting a Wet System" (page 156)
- "Troubleshooting Power Supply Units" (page 157)
- "Troubleshooting Power Source Problems" (page 157)
- "Power Supply Unit Problems" (page 157)
- "Troubleshooting Cooling Problems" (page 158)
- "Troubleshooting Cooling Fans" (page 158)
- "Troubleshooting an Internal USB Key" (page 159)
- "Restarting a Single Channel" (page 160)
- "Disk Space Limit" (page 161)

Safety First - For you and your System

<table>
<tr>
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⚠ **CAUTION**

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<td>

Warranty Claims

Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Rohde & Schwarz is not covered by your warranty.

Read and follow the safety instructions that are shipped with your product.

</td>
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</table>

Troubleshooting External Connections

Before troubleshooting any external devices, ensure that all external cables are securely attached to the external connectors on your system before troubleshooting any external devices.

Troubleshooting the Video Subsystem

Perform the following steps:

1. Check the cable connections (power and display) to the monitor.

2. Check the video interface cabling from the system to the monitor.

3. Run the appropriate diagnostic test.

If the tests run successfully, the problem is not related to video hardware. If the tests fail, contact your local vendor or Rohde & Schwarz directly.

Troubleshooting a USB Device

Follow these steps to troubleshoot a USB keyboard or mouse. For other USB devices, contact your local vendor or Rohde & Schwarz GmbH & Co. KG directly.

Perform the following steps:

1. Disconnect the keyboard and/or mouse cables from the system and reconnect them.

2. If the problem persists, connect the keyboard and/or mouse to another USB port on the system.

3. If the problem is resolved, restart the system, enter System Setup, and check if the non-functioning USB ports are enabled.

(i) Older operating systems may not support USB 3.0.

4. Check if USB 3.0 is enabled in System Setup. If enabled, disable it and see if the issue is resolved.

5. If the problem is not resolved, replace the keyboard and/or mouse with a known working keyboard or mouse.

If all troubleshooting fails, contact your local vendor or Rohde & Schwarz directly.

Troubleshooting a Wet System

Perform the following steps:

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Contact Rohde & Schwarz.

Troubleshooting Power Supply Units

Troubleshooting Power Source Problems

Perform the following steps:

1. Press the power button to ensure that your system is turned on. If the power indicator does not glow when the power button is pressed, press the power button firmly.

2. Plug in another working power supply unit to ensure that the system board is not faulty.

3. Ensure that no loose connections exist.
   For example, loose power cables.

4. Ensure that the power source meets applicable standards.

5. Ensure that there are no short circuits.

6. Have a qualified electrician check the line voltage to ensure that it meets the needed specifications.

Power Supply Unit Problems

Perform the following steps:

1. Ensure that no loose connections exist.
   For example, loose power cables.

2. Ensure that the power supply handle/LED indicates that the power supply is working properly.

3. If you have recently upgraded your system, ensure that the power supply unit has enough power to support the new system.

4. If you have a redundant power supply configuration, ensure that both the power supply units are of the same type and wattage.
   If the LED You may have to upgrade to a higher wattage power supply unit.

5. Ensure that you use only power supply units with the Extended Power Performance (EPP) label on the back.

6. Reseat the power supply unit.
   NOTE: After installing a power supply unit, allow several seconds for the system to recognize the power supply unit and determine if it is working properly.

If the problem persists, contact your local vendor or Rohde & Schwarz directly.

Troubleshooting Cooling Problems

Ensure that the following conditions exist:

- System cover, cooling shroud, EMI filler panel, memory module blank, or back filler bracket is not removed.
- Ambient temperature is not higher than the system specific ambient temperature.
- External airflow is not obstructed.
- A cooling fan is not removed or has not failed.
- The expansion card installation guidelines have been followed.

Troubleshooting Cooling Fans

Requirements:
- ✓ Follow the safety guidelines listed in chapter "Safety Instructions" on page 126 and chapter "Safety" on page 9.
- ✓ If installed, remove the front plate.
- ✓ If applicable, remove the system from the rack.
- ✓ Remove the system cover as described in chapter "Removing the System Cover" on page 128.

(i) The fan number is referenced by the systems management software. In the event of a problem with a particular fan, you can easily identify and replace it by noting down the fan numbers on the cooling fan assembly.

Perform the following steps:

1. Reseat the fan or the fan's power cable.

2. Install the system cover as described in chapter "Installing the System Cover" on page 129.

3. Restart the system.

If the problem persists, contact your local vendor or Rohde & Schwarz directly.

Troubleshooting an Internal USB Key

Perform the following steps:

1. Enter System Setup and ensure that the **USB key port** is enabled on the **Integrated Devices** screen.

2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

3. Remove the system cover as described in "Removing the System Cover" on page 128.

4. Locate the USB key and reseat it.

5. Install the system cover as described in "Installing the System Cover" on page 129.

6. Turn on the system and attached peripherals, and check if the USB key is functioning.

7. If the problem is not resolved, repeat step 2 and step 3.

8. Insert a known working USB key.

9. Install the system cover as described in "Installing the System Cover" on page 129.

If the problem persists, contact your local vendor or Rohde & Schwarz directly.

Restarting a Single Channel

Currently, restarting a single VENICE channel is possible only via terminal. This section describes the procedure of restarting a single channel without having to restart the rest of the adjacent channels.

Perform the following steps:

1. If using a Windows system, make sure a SSH client (e.g PuTTY) is installed which will allow you to access a remote Linux based VENICE system.

2. In the command prompt, log in to the VENICE server.

Systems build before 2020	**USERNAME**: `root` **PASSWORD**: `password`
Systems build after 2020	**USERNAME**: `root` **PASSWORD**: `[serial number of the device]`.

▷ After login the command prompt should look like this:
   `root@[name-of-the-system]`

3. Stop the desired channel with **`/opt/rohde-schwarz/venice stop [channel number]`**.

```
[root@venice-s414-101417 ~]# /opt/rohde-schwarz/Venice/script/venice stop 2
Stopping veniceserver on channel 2 (PORT=4712) [pid:36233]...
veniceserver on channel 2 (PORT=4712)
is stopped.                                                    [  OK  ]
Stopping avus on channel 2 (PORT=4212) [pid:34914] ...
is stopped.                                                    [  OK  ]
purging avatars
```

4. Start the channel again with **`/opt/rohde-schwarz/venice start [channel number]`**.

```
[root@venice-s414-101417 ~]# /opt/rohde-schwarz/Venice/script/venice start 2
Failed to LOAD device config! Error: 10
Starting avus on channel 2 (PORT=4212) ...
NUMACTL: 'numactl --interleave=all -- '
is started.                                                    [  OK  ]
Starting veniceserver on channel 2 (PORT=4712) ...
NUMACTL: 'numactl --interleave=all -- '
is started.                                                    [  OK  ]
```

The error message "Failed to load device config" is not relevant in that case and can be ignored.

Disk Space Limit

To ensure smooth operation, FIMS reports a disk full message in case a certain free space limit is exceeded during operation. The limit size is not fixed but rather calculated dynamically depending on the storage capacity currently in use. It is calculated based on the following formula:

DiskLimit = MIN(300GB, MAX(10GB, DISK_SIZE*1%)) -> 1% of disk space but not smaller than 10 GB and not greater than 300 GB.

Disk Space Limit

Technical Data

R&S®VENICE S

Specifications
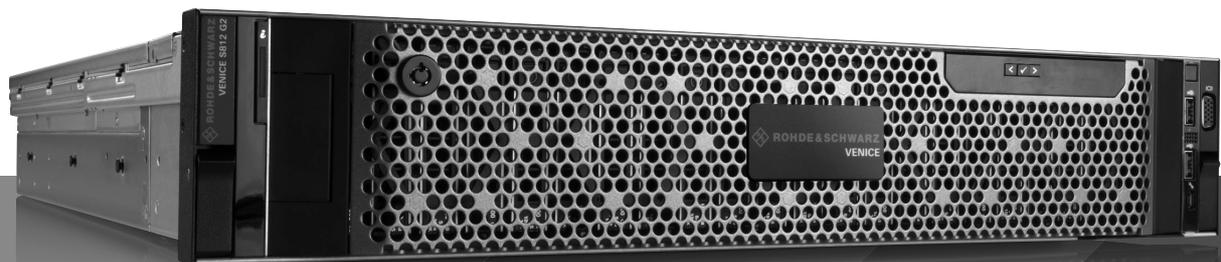
Data Sheet
Version 07.00

ROHDE&SCHWARZ

Make ideas real

Version 07.00, June 2021

CONTENTS

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 <, ≤, >, ≥, ±, 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.
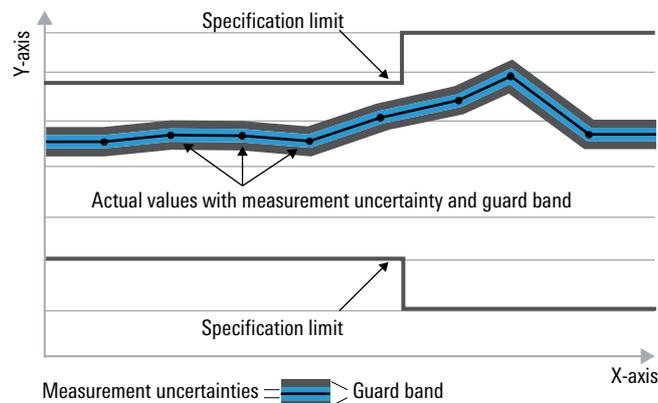
Specifications without limits

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

The new R&S®VENICE platform can be flexibly adapted to your requirements thanks to its software architecture and scalability. For studio and live applications, the best application scenario is always just a software license away. The foundation is our new R&S®VENICE microservice core paired with commercial off-the-shelf hardware and a video I/O board designed by Rohde & Schwarz. This allows R&S®VENICE to connect to traditional SDI infrastructures as well as IP infrastructure. You control the pace of the transition to future architectures.

- On-air reliability
  The entire system has no single point of failure due 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 your requirements, no matter how many channels and how much storage capacity or bandwidth you need.
- UHD and HDR-ready
  Supports UHD material up to p60. Supports Rec. 709 and Rec. 2020 allowing for high quality productions in HDR.
- High channel density
  Up to two UHD p60 channels or up to eight HD p60 channels in just 2 HU.
- Comprehensive software-based codec support
- Interoperability
  Highly interoperable, support for various communication protocols such as VDCP, FIMS, MOS.
- Storage options
  Can be equipped with up to 24 TB internal RAID storage and natively integrates into spectrum scale infrastructures.

Specifications

System configuration	• 2 HU rackmount server chassis • up to 22 front-mounted, hot-swappable media hard drives • 1+1 redundant front-mounted, hot-swappable operating system hard 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 Gigabit Ethernet ports • 2 × 10 Gigabit Ethernet ports • 2 × USB 3.0 ports (rear) • 2 × USB 2.0 ports (front) • Linux operating system

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		• four/eight 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)		• one/two bidirectional UHD-1 channels • optional transform functionality • one/two HD downconversion output channels (locked to UHD-1 channel)

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Connectivity (inputs and outputs)

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

Audio

Input		8 pairs (16 channels), embedded
Output		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 and Class 480, 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 please refer to the supported file formats document for R&S®VENICE S software version 3.5 and software version 4.x.

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 and pass-through	scenarist closed caption (SCC)
	standards	EIA-608/708
	up/down/cross conversion [1]	• support for NTSC EIA-608 to/from EIA-708 conversion • support for line 21 to EIA-608/708 conversion
Subtitle formats	file insertion and pass-through	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

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

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Protocols, file interchange and file ingest

Protocols	TCP/IP, RS-422 serial	video disk control protocol (VDCP) [1]
	TCP/IP	FIMS capture service (v1.07, SOAP)
	TCP/IP	FIMS transform service (v1.07, SOAP)
	TCP/IP	MOS 3.8 (SOAP)
	TCP/IP	Spycer webservice (SOAP)
	TCP/IP	simple network management protocol (SNMP)
	TCP/IP	NMOS (IS04, IS05)
	UDP	SMPTE 2110-20 based transport of professional video over an IP network [1]
	UDP	SMPTE 2110-30 based transport of professional audio over an IP network [1]
	UDP	SMPTE 2110-40 based transport of professional ancillary data over an IP network [1]
File interchange	FTP	active and passive FTP, FXP
	SMB	v1, v2, v3

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		50/60 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: • 2014/30/EU • 2014/35/EU • 2011/65/EU • 2009/125/EC
FCC rating		class A
UL		in line with the following standards: • 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 × 3.42 in × 29.58 in)
Weight	with drives	max. 31.4 kg (69.23 lb)

Version 07.00, June 2021

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		50/60 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: • 2014/30/EU • 2014/35/EU • 2011/65/EU • 2009/125/EC
FCC rating		class A
UL		in line with the following standards: • 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 × 3.42 in × 29.6 in)
Weight	with drives	max. 33.4 kg (73.6 lb)

Rack support

Rackmounting		
Rails		• sliding rails for tool-less mounting in 4-post racks with square or unthreaded round holes or • tooled 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

In order to determine the right system and professional support to meet your requirements, please contact your local
Rohde & Schwarz sales representative.

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ROHDE&SCHWARZ

CE

Declaration of Conformity

This is to certify that:

Equipment type	Stock No.	Designation
VEN400 VENICE S400	2906.1300.02	Channel Playout
VEN400G2 VENICE S400G2	2906.1300.12	Channel Playout
VEN407 VENICE S407	2906.1316.02	Channel Playout
VEN407G2 VENICE S407G2	2906.1316.12	Channel Playout
VEN414 VENICE S414	2906.1322.02	Channel Playout
VEN414G2 VENICE S414G2	2906.1322.12	Channel Playout
VEN800G2 VENICE S800G2	2906.1300.22	Channel Playout
VEN812G2 VENICE S812G2	2906.1316.22	Channel Playout
VEN824G2 VENICE S824 G2	2906.1322.22	Channel Playout

complies with the provisions of the Directive of the Council of the European Union on the approximation of the laws of the Member States

— relating to electrical equipment for use within defined voltage limits (2014/35/EU) [LVD]

— relating to electromagnetic compatibility (2014/30/EU) [EMCD]

— relating to restriction of the use of hazardous substances in electrical and electronic equipment (2011/65/EU) [RoHS]

Conformity is proven by compliance with the following standards

EN 62368-1:2016
EN 55024: 2010
EN 55032: 2015
EN IEC 63000:2018   (ROHS)

For the assessment of electromagnetic compatibility, the limits of radio interference for Class A equipment as well as the immunity to interference for operation in industry have been used as a basis.

ROHDE & SCHWARZ GmbH & Co. KG
Mühldorfstr. 15, D-81671 Munich

Template: CE_EMCD_LVD_3572.7805.00.dotx 3572.7805.00 / Äl 01.00

Declaration of Conformity (CE)

Declaration of Conformity (CE)

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