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AT A GLANCE

In a heterogeneous world of ever growing and fast moving standards and formats for media content transport and encoding, flexibility and cost are winning factors. R&S®PRISMON is designed from the ground up to allow broadcast and media service providers to successfully solve these challenges.

R&S®PRISMON is an innovative and versatile software based solution for monitoring and multiviewing of audio/video content.

It is designed to support the present and future plethora of standards for content transport and media formats, both in legacy and modern IP based environments. In addition to supporting classic and IP based SDI signals, it also offers a comprehensive set of protocols for OTT/streaming scenarios.

With its comprehensive protocol stack and rich feature set, R&S®PRISMON offers broadcast and media service providers a single platform for convergent monitoring and multiviewing – from channel playout and contribution networks to distribution environments (e.g. terrestrial transmitter sites, satellite up-/downlink stations, IPTV backbone hubs, CDNs).

R&S®PRISMON is designed from the ground up as a software defined solution. Its modular software framework ensures future-proof extensibility to new transport protocols and media formats in a fast and cost-effective manner, protecting the investment of broadcast and media service providers.

The solutions operate either on a scalable selection of COTS server platforms with a comprehensive set of I/O accessories for support of legacy signals or on major hypervisors in pure cloud based environments. Both hardware and cloud based deployments of R&S®PRISMON enjoy the same set of powerful capabilities and features.

Key facts

- ▶ Multistandard/multiprotocol support for unmatched versatility (e.g. ASI, (3G-)SDI, SMPTE 2022-1/2, SMPTE 2022-6/7, SMPTE 2110-20/21/30/40, AMWA NMOS, OTT multiprotocol suite, DVB, NDI®, SRT)
- ▶ Multi-application approach for AV monitoring in playout/contribution and distribution environments on a single platform
- ▶ Low latency multiviewer solution for IP based studio/production/playout environments
- ▶ Fully software defined solution for future-proof extensibility
- ▶ Cloud-enabled platform and orchestration-ready design for dynamic and flexible allocation of monitoring capacity



BENEFITS AND KEY FEATURES

Unmatched versatility in transport protocols and standards

- ▶ Support for IP based signal types (SMPTE 2022-1/2, SMPTE 2022-6/7, SMPTE-20/30/31/40, AIMS, AMWA NMOS IS-04/05, NDI®, SRT)
- ▶ Support for classic signal types (SDI, ASI)
- ▶ Multiprotocol stack for OTT/streaming (CDN download/upload, VoD download)
- ▶ DVB
- ▶ [page 4](#)

Unmatched versatility in media formats and standards

- ▶ Support for video services with resolutions up to UHD
- ▶ Comprehensive set of video codecs (MPEG-2, H.264/AVC, H.265/HEVC, J2K, TICO)
- ▶ Comprehensive set of audio codecs (MPEG-1/2 audio layer II, AAC, HE-AAC, ATSC A/52 (AC-3), Dolby Digital™, Dolby Digital Plus™, Dolby E™, Vorbis)
- ▶ [page 4](#)

Cost-effective, convergent monitoring of playout/contribution and distribution environments

- ▶ Multi-application approach with unified software framework
- ▶ Flexible choice of computing platforms (industry-standard IT server or hypervisor)
- ▶ Scalable signal input and decoding through distributed multiviewer function
- ▶ [page 5](#)

Comprehensive and extendable set of functions for signal analysis and content monitoring

- ▶ Continuous decoding and analysis of audio services
- ▶ Continuous/periodic decoding and analysis of video services
- ▶ T2-MI decoding for TSolP/TS ASI
- ▶ ETSI TR 101290 monitoring
- ▶ Video live quality measurement (LiveQM)
- ▶ Video freeze with allow-listing
- ▶ Video content compare
- ▶ Incident recording
- ▶ Penalty box screen
- ▶ [page 6](#)

Comprehensive set of functions for system administration

- ▶ Web based GUI/RESTful API for remote configuration and administration
- ▶ Email and SNMP based notification in case of alerts and alarms
- ▶ API for interworking in AMWA NMOS scenarios
- ▶ [page 8](#)

Powerful multiviewer video wall

- ▶ Flexible layout with built-in editor
- ▶ Resolution up to UHD
- ▶ IP based remote output (SMPTE 2022-1/2, SMPTE 2022-6/7, SMPTE 2110-20/21/30 and OTT)
- ▶ Overlay display of supplementary monitoring and analysis information
- ▶ Low latency
- ▶ [page 9](#)

Versatile multiviewer control center (MCC)

- ▶ Central management and control of screen layouts
- ▶ Central orchestration and deployment of scenarios
- ▶ Scalability and multi-head support
- ▶ Enhanced screen layout and tile editor
- ▶ Detailed control of user privileges
- ▶ Flexible deployment options
- ▶ [page 10](#)

Future-proof extensibility

- ▶ Fully software defined solution
- ▶ Modular software framework
- ▶ Comprehensive set of I/O accessories for legacy support
- ▶ [page 11](#)

Dynamic and flexible allocation of monitoring capacity in the cloud

- ▶ Support for operation in the cloud
- ▶ Support for major hypervisor types
- ▶ License server with dynamic allocation of floating licenses
- ▶ Orchestration-ready design
- ▶ [page 12](#)

UNMATCHED VERSATILITY IN TRANSPORT PROTOCOLS AND STANDARDS

R&S®PRISMON monitors content transport in both legacy and modern IP based environments. In addition to all relevant protocols and standards for classic and IP based transport of SDI signals, it supports a comprehensive set of protocols for OTT/streaming scenarios.

Support for IP based signal types

Transport of content in the future will dominantly be over IP based networks. R&S®PRISMON supports IP based transport for transport streams (SMPTE 2022-1/2) as well as all relevant approaches to transport of SDI signals over IP (SMPTE 2022-6/7 and SMPTE 2110-20/30/40).

In particular for SDI signals, this allows R&S®PRISMON to seamlessly fit into any existing installation and to successfully interwork with systems of other vendors regardless of their respective preference for SDI over IP.

Support for classic signal types

For investment protection and smooth interworking with the installed base during the transitional period to 100% IP based transport, R&S®PRISMON supports input of classic (3G-)SDI and ASI signals.

Multiprotocol stack for OTT/streaming

The OTT/streaming environment is characterized by a plethora of competing and complementary protocols and standards posing challenges to service providers. The comprehensive R&S®PRISMON protocol stack for OTT/streaming (HLS, MSS/HSS, DASH, CMAF, HDS, RTMP, HbbTV, IceCast) helps providers overcome these challenges. R&S®PRISMON also features use cases for monitoring CDN download/upload and VoD download.

DVB

For investment protection and smooth interworking with the installed base, R&S®PRISMON supports input of MPEG transport streams (ISO/IEC 13818-1, ITU-T Rec. H.222.0).

UNMATCHED VERSATILITY IN MEDIA FORMATS AND STANDARDS

R&S®PRISMON monitors media content in audio and video services up to UHD resolution. As well as relevant classic video formats and standards, it also supports modern mezzanine formats.

Support for video services with resolutions up to UHD

Video services are monitored and analyzed in SD, HD or UHD resolutions at various frame rates. For full situational awareness, a mixture of different input resolutions and frame rates can be combined into a single overall multi-viewer video wall on the output side.

Comprehensive set of video codecs

R&S®PRISMON supports many relevant established video formats and standards such as MPEG-2, H.264/AVC and H.265/HEVC. In line with recent approaches, e.g. SMPTE 2110/AMWA NMOS, it also handles modern mezzanine formats such as J2K and TICO. Extension to further codecs is possible due to the inherent modular software framework of R&S®PRISMON.

Comprehensive set of audio codecs

R&S®PRISMON supports a comprehensive set of audio codecs such as MPEG-1/2 audio layer II, AAC, HE-AAC, ATSC A/52 (AC-3), Dolby Digital™, Dolby Digital Plus™, Dolby E™ and VORBIS. Extension to further codecs is possible due to the inherent modular software framework of R&S®PRISMON.

COST-EFFECTIVE, CONVERGENT MONITORING OF PLAYOUT/CONTRIBUTION AND DISTRIBUTION ENVIRONMENTS

In a convergent approach to monitoring, broadcast and media service providers benefit from CAPEX/OPEX savings in procurement, training and maintenance of their related infrastructure.

Multi-application approach with unified software framework

R&S®PRISMON is designed as a single overall solution with a multi-application approach for monitoring playout/contribution and distribution scenarios. The system utilizes a unified software framework for convergent monitoring of both playout/contribution and distribution input signals: a single shared software functional block uniformly handles monitoring and analysis of all types of input signals. Generation of the respective set of output signals is also handled uniformly as illustrated in the figure below.

Operating personnel and technicians can rely on the same powerful tool set regardless of whether they want to monitor and analyze classic SDI/ASI or TSoIP, SDIoIP and OTT/streaming input signals and the media content therein. They will also appreciate the identical easy-to-use graphical interface in each application scenario. The immediate benefit of this convergent approach for broadcast and media service providers is increased productivity and CAPEX/OPEX savings in procurement/training.

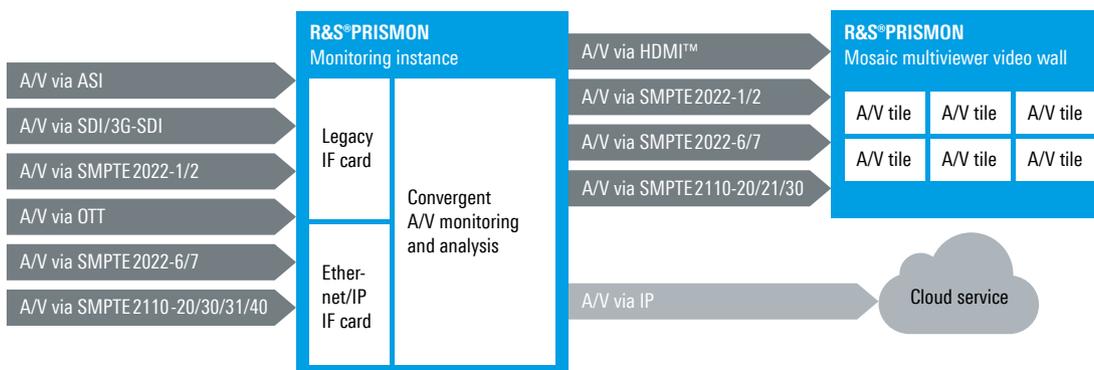
Flexible choice of computing platforms

R&S®PRISMON is available on a selection of industry standard IT servers (1 RU and 2 RU) or hypervisor types. From the user perspective, the R&S®PRISMON application software operates identically on all underlying computing platforms. Users can choose among several hardware platforms to meet their individual performance requirements. Again, obvious benefits are the CAPEX/OPEX savings in procurement/maintenance.

Scalable signal input and decoding through distributed multiviewer function

This scalability option enables users to display a mosaic view on a particular R&S®PRISMON system with input services decoded on any other R&S®PRISMON system within the same proxy IP network. This allows, for example, rendering a view with multiple UHD inputs – beyond the decoding capacity of a single system. In addition, it helps overcome the fact that only a limited number of physical ASI and SDI interfaces are available on a single system.

Monitoring of heterogeneous input signals with the R&S®PRISMON solution



COMPREHENSIVE AND EXTENDABLE SET OF FUNCTIONS FOR SIGNAL ANALYSIS AND CONTENT MONITORING

R&S®PRISMON provides both basic and enhanced analysis of audio and video services, including rich supplementary information. It also supports monitoring of T2-MI or ETSI TR 101290 parameters for transport streams and monitoring functions performed on the actual content of the service.

Continuous decoding and analysis of audio services

This function receives the demultiplexed data for one service. The data is decoded and the audio stream is continuously analyzed for content errors such as audio lost and audio silence. In enhanced mode, further checks and information such as audio codec, audio overload and constant audio are available.

Continuous/periodic decoding and analysis of video services

This function receives the demultiplexed data for one service. The data is decoded and the video stream is continuously or periodically (thumbnail, round robin) analyzed for content errors such as video lost and still image errors. In enhanced mode, further checks and information such as teletext error, subtitle error, video black, video deviation, video codec, video resolution, parental control and running state are available.

T2-MI decoding for TSolP/TS ASI

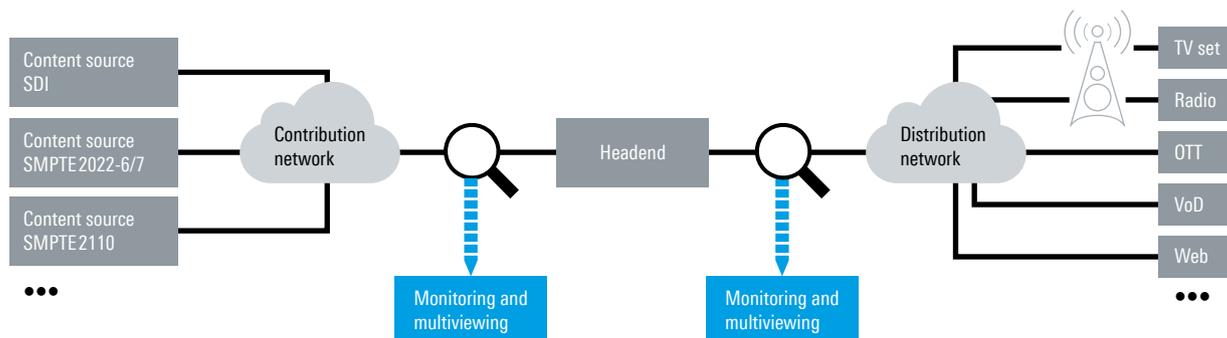
This function monitors the transport stream on the interface to a modulator for a second generation terrestrial television system (DVB-T2). Primary parameters monitored are the load and bit rate of the transport stream. Enhanced monitoring data such as the total number of continuity count errors within the transport stream or packet statistics is also available.

ETSI TR 101290 monitoring

This function monitors DVB transport in line with the ETSI TR 101290 measurement guidelines to ensure syntactical correctness and content integrity. All measurements¹⁾ specified in the ETSI TR 101290 measurement guidelines under priorities 1, 2 and 3 are carried out simultaneously for every component of all transport streams being monitored. Detected faults are presented in the form of error counters, time series plots and log entries with detailed error information. Configuration supports editing of limits and muting of measurements to relax constraints if desired.

¹⁾ Except buffer-related measurements.

Convergent content monitoring in a multidimensional, diverse world of media and broadcast services



Video live quality measurement (LiveQM)

This function provides live quality comparison of a signal video stream to a reference video stream having matching resolution, frame rate and field type. Using innovative technology, R&S®PRISMON can automatically synchronize between two video streams, regardless of the delay between the streams. Synchronization is fully automatic and requires no user intervention to compensate for the latency between the streams. Once synchronized, R&S®PRISMON is able to perform a full reference based PSNR, SSIM or MOS-V measurement on a frame-by-frame, pixel-by-pixel basis. While recording hundreds of measurements per second to enable complex post-processing, R&S®PRISMON also displays a heat map of the areas most affected by compression artifacts or noise for a quick and easy visual interpretation.

Video freeze allow-listing

This function monitors video services for freeze frame errors against an allow-list of 'known good', prerecorded still images to prevent false alarms. Broadcast content can contain images that could be interpreted by a monitoring system as a freeze frame, for example a banner advertising an upcoming sporting event that is a still image displayed for several seconds. With the innovative R&S®PRISMON video freeze allow-listing function, users can specify predefined frames of video that contain such banners and subsequently prevent monitoring from raising a false alarm. Allow-lists can be generated from predefined graphic images imported from a file. In enhanced allow-listing mode, detected freeze frames are automatically stored internally to R&S®PRISMON for later selection by a user as 'known good' freeze frames, effectively streamlining the allow-list generation process.

Video content compare

This function automates monitoring of the content of an outgoing channel against a known good channel in order to prevent delivery of the wrong content to the wrong platform (e.g. in case of age-rated or DRM-controlled content). Using innovative technology, R&S®PRISMON can automatically synchronize between two video streams, largely independent of the delay between the streams. The synchronization process is fully automatic and requires no user intervention to compensate for the latency between the streams. The sample and reference video stream may have different resolutions and frame rates. After the initial synchronization of the streams, the real-time comparison of the two streams uses criteria such as moving objects, scene cuts and luminance levels to generate codec- and

resolution-agnostic fingerprints of each received and decoded video stream. The fingerprints are then used to compare the streams. One example could be ensuring that identical content is being transmitted on a low resolution service compared with a premium high-definition service. Based on the result of the comparison, an alarm can be raised to trigger the user to investigate and take corrective action.

Incident recording

This function provides event-triggered recording of TS or OTT media streams to the system's hard disk. A sliding window moves virtually across the monitored stream. In case of an event, the current sliding window is captured. The size of the sliding window and the type of events triggering the capture can be customized by the user. The captured media stream in combination with the system's detailed error/alarm-log entries can be used to quickly and conveniently identify the root cause of operational incidents.

Penalty box screen

On a dedicated multiviewer screen, this function provides a compact visualization of all channels currently in an error/alarm state. In a pop-up fashion, the penalty box screen is dynamically filled with audio/video tiles for affected services. These pop-up tiles either stay as long as the error/alarm is active or until the event is acknowledged by the operator. Operators benefit from convenient and prompt notification about problematic services that need extra attention.

COMPREHENSIVE SET OF FUNCTIONS FOR SYSTEM ADMINISTRATION

R&S®PRISMON supports standard system administration by operators as well as options for automated operation and alarm notification.

Web based GUI/RESTful API for remote configuration and administration

R&S®PRISMON is configured and administered centrally via a web based GUI. The GUI is intuitive and easy to use, since its layout resembles the monitoring workflow from input to output. Access is over a local or remote network connection using modern web browsers. Following successful authorization, different access levels with corresponding levels of administrative capabilities exist. Additionally, a RESTful API is available for remote control and automation. In addition, R&S®PRISMON provides all monitoring and configuration values via MQTT.

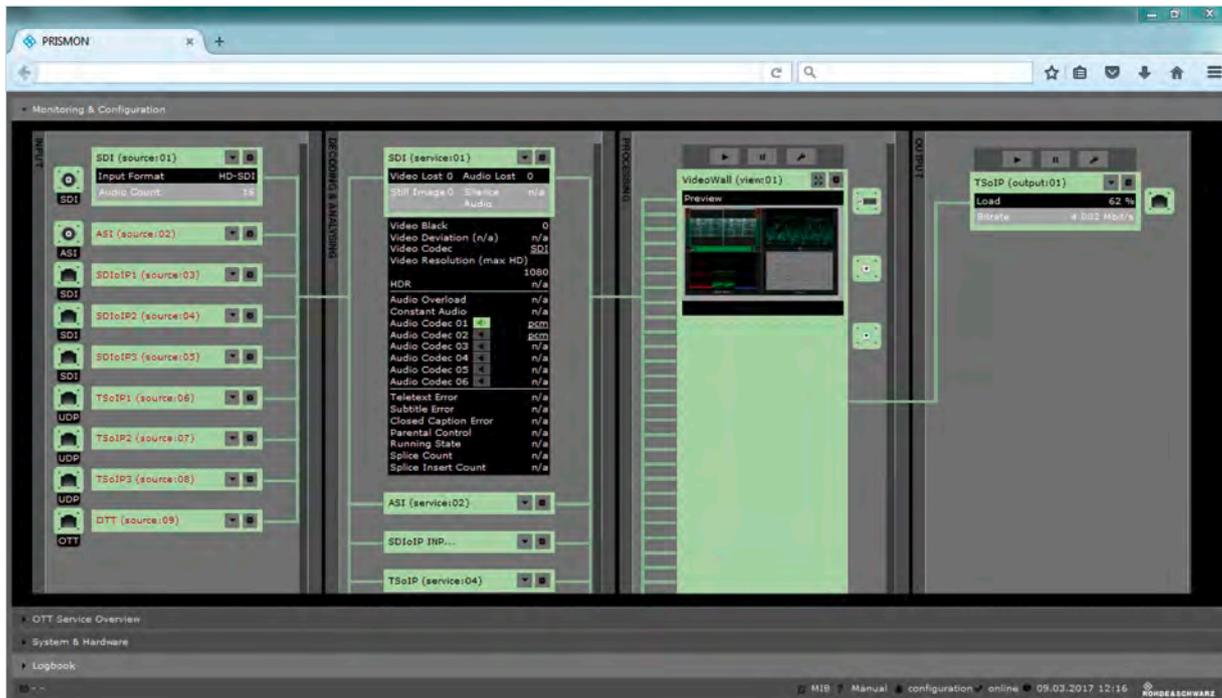
API for interworking in AMWA NMOS scenarios

R&S®PRISMON provides an AMWA NMOS IS-04 (discovery and registration) node API. This API allows the SMPTE2110 and SMPTE2022-6/7 receivers and senders of R&S®PRISMON to be discovered by an NMOS registration server in the network. AMWA NMOS IS-05 is supported for modern IP based device connection management.

Email based notification and sending of SNMP traps in case of alerts and alarms

R&S®PRISMON can send out emails to a configurable list of recipients and/or send out SNMP traps in case of alerts and alarms. Triggers can be either system events or from real-time content monitoring and analyzing processes.

Intuitive and easy-to-use web based GUI for R&S®PRISMON configuration and administration



POWERFUL MULTIVIEWER VIDEO WALL

R&S®PRISMON offers operating personnel and technicians a UHD multiviewer quad video wall. Situational awareness of broadcast and media services is further enhanced by the optional on-screen display of supplementary information about monitored audio and video services.

Flexible layout with built-in editor

With R&S®PRISMON, tiles for audio and video services are freely positionable in the layout of the multiviewer video wall. Multiple tile sizes for video and audio services are supported. Tile presets for video, teletext, audio, quality, waveform, status and studio exist for the convenience of the user. The easy-to-use, built-in layout editor of the R&S®PRISMON administrative GUI enables flexible layout of the generated multiviewer video wall (e.g. changing the position and size of a tile).

Resolution up to UHD

On hardware based platforms of R&S®PRISMON systems equipped with an extension graphics card, the generated multiviewer video wall supports multiple output views.

IP based remote output

Besides local HDMI™/mDP based output, the generated multiviewer video wall can optionally also be sent via SMPTE 2022-1/2, SMPTE 2022-6/7, SMPTE 2110-20/21/30 SRT and OTT over the network to remote output units (e.g. PCs) in variable resolutions up to UHD.

Overlay display of supplementary monitoring and analysis information

Besides the actual tiles for audio or video services, supplementary on-screen elements such as audio meters with peak indication, clocks, log files, static text boxes and UMD/tally information can be displayed, enriching the multiviewer screen with additional information to further enhance the situational awareness of the operating personnel and technicians.

Low latency

R&S®PRISMON provides market-leading low latency for SMPTE 2110/SMPTE 2022-6 based input signals to SMPTE 2110/SMPTE 2022-6 based output of corresponding video tile mosaics. This, together with other features such as the flexible layout editor, makes R&S®PRISMON a powerful multiviewer solution for future-proof IP based studio/production/playout environments.

Sample screenshot showing the freely positionable tiles; R&S®PRISMON supports multiple tile sizes



VERSATILE MULTIVIEWER CONTROL CENTER (MCC)

The R&S®PRISMON multiviewer control center (MCC) enables central control of screen layouts and orchestration of deployment scenarios for large IP-multiviewer installations in studio/production environments. Users benefit from increased productivity and operational flexibility as well as time and cost savings.

Central management and control of screen layouts

The MCC function enables central and efficient control of all multiviewer screen settings created by R&S®PRISMON, including screen layouts, tile inputs and tally configurations. This is especially useful for installations comprising large R&S®PRISMON IP-multiviewer sets in studio/production environments.

Central scenario orchestration and deployment

The MCC function introduces a powerful 'Rooms&Scenarios' operational concept (see figure below), enabling orchestrated operation of all managed R&S®PRISMON units. Users benefit from fast and flexible deployment of complex operational multiviewer scenarios. This includes simultaneous switching from screen layouts for e.g. live sports broadcasts to layouts for news programs on all multiviewer screens of a production facility with a single button press in the MCC.

Scalability and multi-head support

If combined with the R&S®PRISMON software option R&S®PRM-KSDMV scalable distributed multiviewer, the MCC function provides independent, linear I/O scalability

and multi-head support, bringing I/O scalability and availability of SDI/matrix switch based multiviewers into the IP domain.

Enhanced screen layout and tile editor

The central MCC function further enhances the built-in local screen layout and tile editing capabilities of standard R&S®PRISMON units. If installed locally, this feature can also leverage standalone R&S®PRISMON units such as pure monitoring solutions with local multiviewer output.

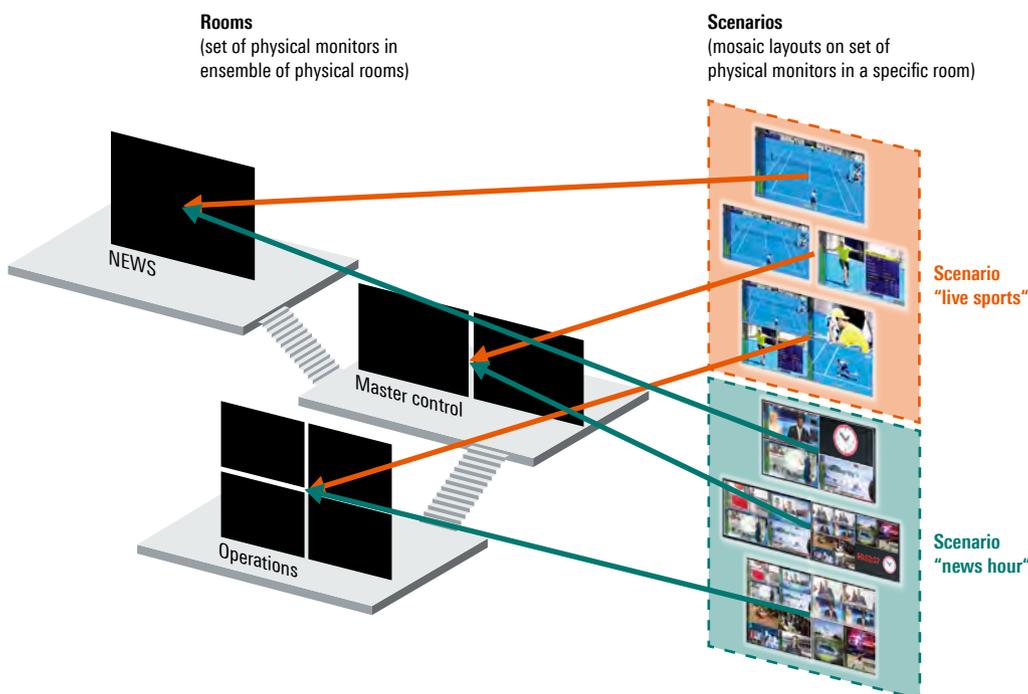
Detailed control of user privileges

Depending on their operational tasks and responsibilities, dedicated privileges can be granted to different MCC users (e.g. add/remove/edit/deploy layouts and scenarios).

Flexible deployment options

The MCC function is an optional, add-on software application for controlling R&S®PRISMON multiviewer devices in an IP network. The frontend GUI is web based. The backend can be hosted on a dedicated server or co-located on any existing R&S®PRISMON unit in the network, e.g. a (redundant) license server, if available.

The MCC enables fast and flexible deployment of highly variable multiviewer setups using the powerful 'Rooms&Scenarios' concept



FUTURE-PROOF EXTENSIBILITY

In a world of ever growing and fast moving standards and formats, the ability to adapt and extend is key. The software defined solution architecture of R&S®PRISMON makes the system a future-proof choice for broadcast and media service providers.

Fully software defined solution

To the greatest possible extent, all R&S®PRISMON functionality and intelligence is implemented in software, utilizing the latest technologies in software engineering, development and testing. Hardware-oriented parts of the solution are limited to the handling of classic input signals such as SDI or ASI in the form of I/O cards. This software defined solution architecture allows R&S®PRISMON to quickly and flexibly address any future requirements that arise in the general broadcast and media market or in user-specific projects.

Modular software framework

In R&S®PRISMON, the aforementioned paradigm of a software defined solution architecture is implemented by the modular software framework outlined in the figure below.

In between the input and output handling of signals, the actual operation of monitoring and analyzing the signal and its content is broken down into a modular chain of functional building blocks. Each building block performs a specific task/service and is fully implemented in software. Future modifications/extensions of the solution can be implemented by inserting a new modular functional building block or an extension to an existing module following a system-internal plugin-like concept.

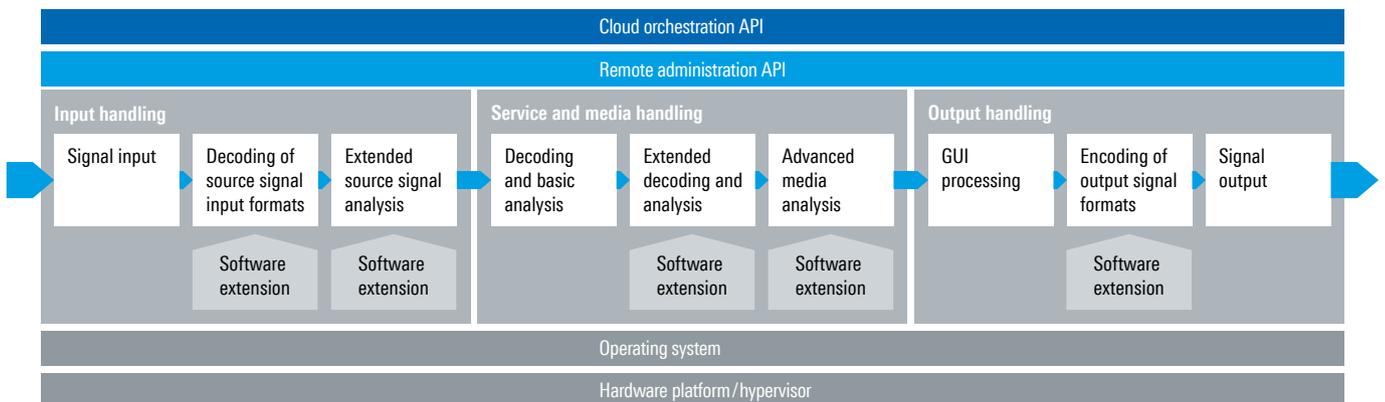
Comprehensive set of I/O accessories for legacy support

For any forward-looking, future-oriented solution, leveraging the installed base is essential. This protects investments already made by broadcast and media service providers and ensures smooth migration from present to future technical scenarios.

R&S®PRISMON offers a comprehensive set of I/O accessories for handling classic input and output signals on IT server platforms in environments that are not yet 100% IP based or in the cloud. The figure below shows the location and choice of various I/O extension modules and interfaces available on the 1 RU and 2 RU platforms.

In addition to the server platform's built-in interfaces, available optional interface types and numbers are:
8 × SDI/ASI (with separate breakout box),
4 × 1 Gigabit Ethernet, 2 × 10 Gigabit Ethernet,
2 × 100 Gigabit Ethernet, UHD extension graphics card.

Key functional components of the R&S®PRISMON solution providing convergent audio/video content monitoring



DYNAMIC AND FLEXIBLE ALLOCATION OF MONITORING CAPACITY IN THE CLOUD

R&S®PRISMON offers a clear migration path into the cloud and features an orchestration-ready design. With cloud based dynamic, on-demand resource allocation and workflow definition, broadcast and media service providers can benefit from resulting CAPEX/OPEX savings and strengthen their competitive position.

Support for operation in the cloud

As a fully software defined solution, R&S®PRISMON application software operates practically agnostically to the underlying computing platform. This provides a clear migration path from hardware based to cloud based platforms while keeping the same functional capabilities and preserving any purchased software licenses. Capacity and performance of the cloud based deployment can be dynamically and flexibly controlled by proper (de)allocation of the performance of the underlying cloud platform.

Support for major hypervisor types

R&S®PRISMON is available for VMware, KVM and other major hypervisors on request. Provision is in the format of OVF images, ensuring maximum portability and compatibility as well as ease of deployment.

License server with dynamic allocation of floating licenses

The type and number of services and media formats that can be monitored and analyzed with R&S®PRISMON is controlled by the type and number of matching software licenses active on a particular instance of R&S®PRISMON.

With R&S®PRISMON, a networked ensemble of R&S®PRISMON instances can be served by a common license server. Individual instances dynamically request and return licenses from the license server according to their current operational needs. The license server centrally tracks and dynamically grants available individual licenses from a license pool that is shared across the complete ensemble of R&S®PRISMON instances.

Even with hardware based R&S®PRISMON instances, this license server approach allows broadcast and media service providers to optimize CAPEX. The support of a license server concept with dynamic allocation of floating licenses becomes a mandatory prerequisite for any deployment of monitoring solutions in the cloud. As a cloud-enabled solution, R&S®PRISMON fully supports this mandatory requirement.

Orchestration-ready design

In broadcast and media scenarios, virtualization and orchestration means that classic physical cable connections between physical devices are replaced by (networked, preferably open) software APIs between virtualized software instances. This makes it possible to allocate resources dynamically and on-demand and to define broadcast and media workflows, which eventually results in CAPEX and OPEX savings for service providers. The figure on page 6 illustrates that the design of the modular software framework of R&S®PRISMON already foresees the inclusion of a corresponding building block of a software API for cloud orchestration.

USE CASE EXAMPLES

R&S®PRISMON provides 24/7 service for a broad range of applications in playout/contribution and distribution environments. Possible use cases range from convergent audio/video content monitoring to video quality assurance and measurements.



USE CASE: CONVERGENT SERVICE-CENTRIC CONTENT MONITORING ACROSS MULTIPLE NETWORK TYPES

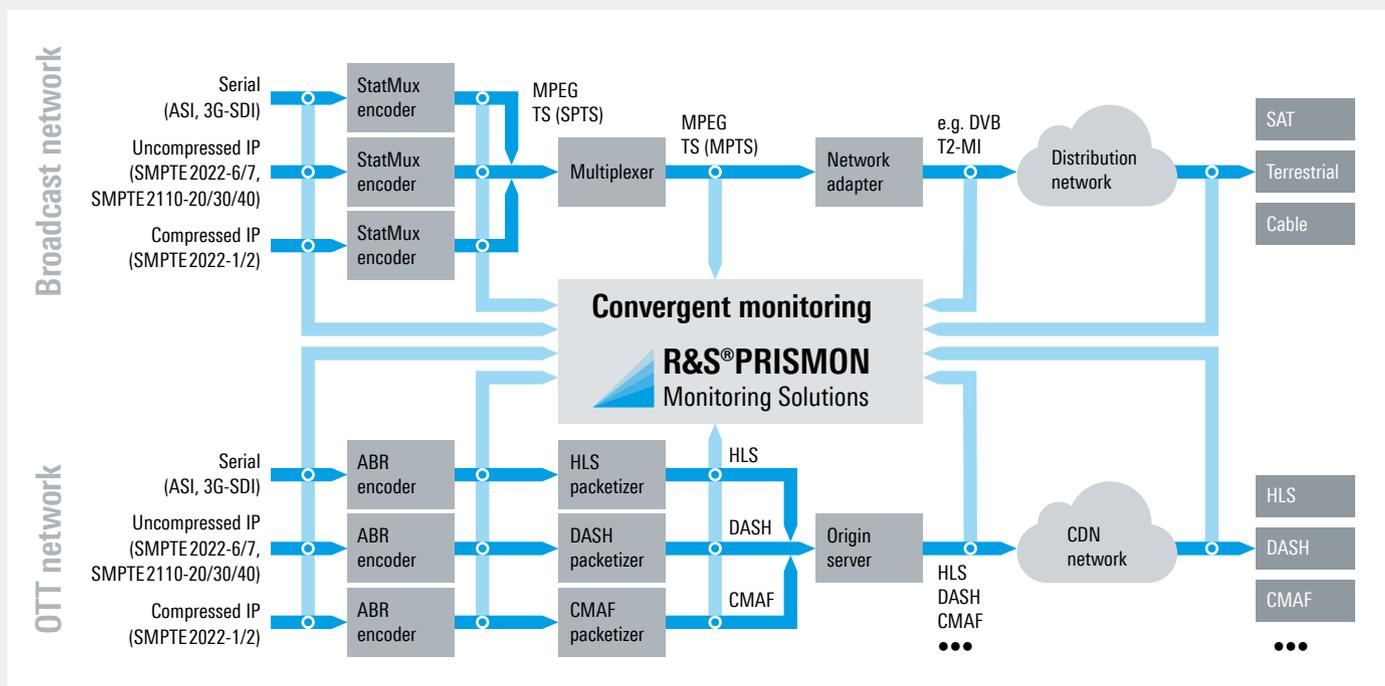
For years, broadcasters and network operators have faced the challenge of increasing signal and protocol diversity. The number of different monitoring tools has been increasing accordingly.

R&S®PRISMON dramatically reduces the number of different monitoring devices and enables a true convergent, service-centric monitoring workflow (see figure below).

This results in the following advantages and benefits for this use case:

- ▶ Combined monitoring and status information for a service transmitted over various distribution networks, in different resolutions and various codecs
- ▶ Less monitoring equipment to be handled by operators
- ▶ Consumes less multiviewer screen space by avoiding duplicates
- ▶ SNMP and MQTT interfaces for easy NMS integration
- ▶ Re-usable licenses for migration scenarios

Convergent service-centric content monitoring across multiple network types



USE CASE: VIDEO QUALITY ASSURANCE AND MEASUREMENTS

Video quality measurements are complex, expensive and time-consuming, yet indispensable for broadcast and media service providers to keep their customers satisfied. Delivering high-quality content to customers while optimizing bandwidth needs per channel is key for the commercial success of any service provider. R&S®PRISMON makes objective video quality measurements on video feeds an easy and quickly achievable task – both in the lab and in live network environments. It supports several parallel measurements using quasi-standard metrics such as PSNR and SSIM. These measurements can be used to benchmark video encoders, monitor and assure video quality as well as to analyze and optimize video production and transmission.

Clear visualization makes results easier to understand

Besides providing the measured video quality as a numeric value, R&S®PRISMON also generates a graphical video representation in real time – clearly highlighting areas and intensity of poor video quality. This allows users to quickly identify any encoding artifacts or other variances – even if they only affect small areas. Graphically presenting the measured video quality also allows users to quickly interpret the results – even for non-specialists who do not deal with video quality measurements on a daily basis.

Easy setup and fully automatic signal synchronization

R&S®PRISMON enables full double-ended difference measurements of live video signals – both encoded and baseband signals. The system automatically calculates the temporal and spatial offset of two video sequences and perfectly aligns them on a frame-by-frame basis. Once synchronization is achieved, the system starts measuring picture differences and outputs the results on a PSNR, SSIM or MOS scale. The system detects and handles any dropped frames and reacts intelligently – synchronization is retained even for 24/7 measurements. All this makes video quality measurements incomparably easy and consequently more efficient.

Parallel measurements for time-saving testing and benchmarking

R&S®PRISMON can perform video quality measurements in parallel. Corresponding results can be viewed side-by-side on a single screen. This makes sequential, one-by-one encoder benchmarking obsolete, dramatically reducing the time and effort for operating personnel and technicians to improve overall video quality.

Sample screenshot showing video live quality measurement (LiveQM) with R&S®PRISMON (© video image content: Sveriges Television AB)



SPECIFICATIONS IN BRIEF

Specifications in brief

Input

Input protocols	IP based input	<ul style="list-style-type: none"> ▶ SMPTE2022-1/2 (TS over IP) ▶ SMPTE2022-6/7 ▶ SMPTE302M ▶ SMPTE2110-20/30/31/40 ▶ AMWA NMOS IS-04/05 ▶ NDI® ▶ SRT (secure reliable transport) ▶ OTT protocol suite (HLS, MSS/HSS, DASH, CMAF, HDS, RTMP, HbbTV, IceCast)
	SDI input	<ul style="list-style-type: none"> ▶ SD-SDI (SMPTE ST 259) ▶ HD-SDI (SMPTE ST 292) ▶ 3G-SDI (SMPTE ST 424) ▶ Quad-Link 3G-SDI
	ASI input	compressed A/V in a MPEG-2 transport stream with ancillary data
	DVB input	MPEG transport stream (ISO/IEC 13818-1, ITU-T Rec. H.222.0)
Video processing		
Video decoding	codecs	<ul style="list-style-type: none"> ▶ MPEG-2 ▶ H.264/AVC ▶ H.265/HEVC ▶ J2K ▶ TICO
	resolutions (horizontal × vertical)	<ul style="list-style-type: none"> ▶ up to 1920 × 1080 pixel for MPEG-2, H.264, J2K, TICO ▶ up to 3840 × 2160 pixel for HEVC
	frame/field rates	23.98/24/25/29.97/30/50/59.94/60
	decryption	<ul style="list-style-type: none"> ▶ DASH: CENC ▶ Microsoft Smooth Streaming, HLS: Microsoft PlayReady™
Video analyzing	functions	<ul style="list-style-type: none"> ▶ determination of video frames with no changes (video freeze) ▶ determination of video frames with low luminance level (video black) ▶ determination of lost video signal ▶ determination of content mismatch ▶ set-actual comparison for codec parameters (template monitoring)
Audio processing		
Audio decoding	codecs	<ul style="list-style-type: none"> ▶ MPEG-1/2 audio layer II ▶ AAC ▶ HE-AAC ▶ ATSC A/52 (AC-3) ▶ Dolby Digital™ ▶ Dolby Digital Plus™ ▶ Dolby E™ ▶ Ogg Vorbis, Ogg Opus
Audio analyzing	functions	<ul style="list-style-type: none"> ▶ determination of audio samples with low audio level (audio silence) ▶ determination of audio samples with high audio level (audio overload) ▶ determination of audio samples with constant audio level (audio constant) ▶ determination of lost audio signal ▶ loudness monitoring ▶ set-actual comparison for codec parameters (template monitoring)

Specifications in brief

Service monitoring and analysis

Data decoding and analysis	functions	<ul style="list-style-type: none"> ▶ teletext decoding ▶ subtitle decoding ▶ determination of lost data signal ▶ closed caption decoding ▶ parental rating ▶ running state ▶ SCTE35/SCTE 104 ▶ HDR monitoring
Video image quality monitoring	functions	<ul style="list-style-type: none"> ▶ reference based video quality monitoring methods (max. resolution: UHD) ▶ reference-free video quality monitoring methods (resolution: 1080i50) ▶ side-by-side visualization ▶ A/V delay measurement
Video content monitoring	functions	<ul style="list-style-type: none"> ▶ video content compare (max. resolution: HD) ▶ video freeze (max. resolution: UHD) ▶ video freeze with allow-listing (max. resolution: HD) ▶ video black (max. resolution: UHD) ▶ set-actual comparison for parameters of codec (template monitoring)
OTT source monitoring	functions	<ul style="list-style-type: none"> ▶ multiprotocol download ▶ multiprotocol upload sniffing ▶ multiprotocol VoD download ▶ digital program insertion (SCTE 35)
DVB source monitoring	function	T2-MI decode for TS over IP/TS ASI
Transport layer monitoring	functions	<ul style="list-style-type: none"> ▶ TR 101290 V1.2.1 – first/second/third priority ▶ digital program insertion (SCTE 35) ▶ adaptive transport stream – encoding boundary point (ATS-EBP)
Incident recording	function	event-triggered recording of sliding window audio/video segments for TS/OTT to hard disk

Multiviewer video wall

Layout		<ul style="list-style-type: none"> ▶ tile preset types: video, teletext, radio, quality, waveform, status, studio ▶ user customizable tile presets ▶ each tile freely positionable ▶ selectable predefined sizes per service tile
Video visualization	aspect ratio handling	<ul style="list-style-type: none"> ▶ automatic scaling to correct aspect ratio ▶ support of dynamic aspect ratio changes
Audio visualization	functions	<ul style="list-style-type: none"> ▶ audio meter scale ▶ peak indicator ▶ RMS indicator
Meta data visualization	functions	<ul style="list-style-type: none"> ▶ display of meta data per tile ▶ dynamic system and description tiles ▶ display of UMD/tally information
HDMI™/mDP output	horizontal × vertical (frames/s)	<ul style="list-style-type: none"> ▶ 1080p25/29.97/30/50/59.94/60 ▶ 2160p25, with mDP up to 4kp60
Streaming output	protocols/video codecs	<ul style="list-style-type: none"> ▶ SMPTE 2022-2 (MPEG-2: 576p25/29.97/30/50/59.94/60; H.264/AVC: up to 1080p25/29.97/30/50/59.94/60) ▶ SMPTE 2022-6/7 (uncompressed: 1080p25/29.97/30/50) ▶ SMPTE 2110-20/21 (type W)/30 (uncompressed: 1080p25/29.97/30/50/59.94/60, 2160p25/29.97/30) ▶ OTT (H.264: 240/576/720/1080p25) ▶ SRT (MPEG-2: 576p25/29.97/30/50/59.94/60; H.264/AVC: up to 1080p25/29.97/30/50/59.94/60)

For detailed specifications and mechanical, electrical, environmental and performance data of available hardware platform variants, please see the full data sheet.

ORDERING INFORMATION

Designation	Type	Order No.
System		
R&S®PRISMON system	R&S®PRM-SYSTEM	2119.7140K02
Hardware and options		
Hardware platform base unit		
R&S®PRISMON BASE base unit ¹⁾	R&S®PRM-BU110	2119.6989.02
R&S®PRISMON ULTRA base unit	R&S®PRM-BU140	2119.7010.02
R&S®PRISMON PRIME X base unit	R&S®PRM-BU230	2119.7056.02
Front panel R&S®PRM-BU1xx generation 2	R&S®BU-ZFP1	2119.7404.02
Front panel R&S®PRM-BU2xx generation 2	R&S®BU-ZFP2	2119.7410.02
Hardware accessories		
Graphics card		
Extension graphics card for VideoWall output	R&S®PRM-B300	2119.7633.02
Extension graphics card for VideoWall mDP output, up to 4x4K	R&S®PRM-B340	2119.7162.02
I/O cards		
PRIOS-M SDI/ASI broadcast input card	R&S®PRM-B1000	2119.7740.02
8 × SDI/ASI BNC interface breakout box for PRIOS-M input card	R&S®PRM-B1100	2119.7756.02
Electrical dual 3G-SDI/ASI video SFP (emSFP) receiver module for PRIOS-M input card	R&S®AVS-B1200	3622.0989.02
4 × 1 Gigabit Ethernet card	R&S®PRM-B600	2119.7656.02
2 × 10 Gigabit Ethernet card (without SFP modules)	R&S®PRM-B610	2119.7640.02
2 × 100 Gigabit Ethernet card (without QSFP28 modules)	R&S®PRM-B640	2119.7585.02
Mounting components		
Base unit (1 RU) rackmount rail kit (Dell) for R&S®PRM-BU110 generation 2	R&S®BU-Z705	2119.9671.02
Base unit (1 RU) rackmount rail kit (Dell) for R&S®PRM-BU140 generation 2	R&S®BU-Z706	2119.9688.02
Base unit X (2 RU) rackmount rail kit (Dell)	R&S®BU-Z708	2119.7685.02
Secondary power supplies		
Second redundant power supply for R&S®PRM-BU140	R&S®BU-Z112	2119.7727.02
Second redundant power supply for R&S®PRM-BU230	R&S®BU-Z111	2119.7710.02
Secondary hard disk		
Second redundant HDD for R&S®PRM-BU110/R&S®PRM-BU140/R&S®PRM-BU230 generation 2	R&S®BU-Z213	2119.9571.02
Software and options		
System software dongle		
R&S®PRISMON system license dongle	R&S®PRM-DONGLE	2119.7110.02
Core software license		
R&S®PRISMON software instance – extended core license	R&S®PRM-KXCORE	2119.8681.02 ²⁾
Input – source signal types and basic monitoring		
Broadcast IP source – instance license	R&S®PRM-KBIPS	2119.8698.02 ²⁾
OTT source – instance license	R&S®PRM-KOTTS	2119.8700.02 ²⁾
SDI/ASI – instance license	R&S®PRM-KSDIS	2119.8717.02 ²⁾
Scalable distributed multiviewer – instance license	R&S®PRM-KSDMV	2119.8781.02 ²⁾
Extended source signal monitoring and analysis		
Extended source signal monitoring and analysis – instance license	R&S®PRM-KEXSM	2119.8723.02 ²⁾
Processing – service decoding and basic analysis		
Video-thumbnail/pure-audio decoder and analysis – instance license	R&S®PRM-KVTAD	2119.8730.02 ²⁾
Video decoding and continuous analysis – single license	R&S®PRM-KSVDC	2119.8746.02 ²⁾
Extended service decoding		
TICO decoder – single license (1 stream)	R&S®PRM-KTICOS	2119.8475.02 ²⁾

¹⁾ R&S®PRM-BU110 serves as platform for redundant license server only.

²⁾ For systems with redundant license server, the order no. of the footnoted software license options ends in '.51' instead of '.02'.

Designation	Type	Order No.
Advanced service analysis		
Video freeze allow-listing – instance license	R&S®PRM-KVAL	2119.8517.02 ²⁾
Video live quality measurement (LiveQM) – instance license	R&S®PRM-KVLQM	2119.8523.02 ²⁾
Video content compare – instance license	R&S®PRM-KVCC	2119.8530.02 ²⁾
Incident recording – instance license	R&S®PRM-KIREC	2119.8669.02 ²⁾
Output – multiviewer formats		
VideoWall: multiviewer mosaic view output – single license	R&S®PRM-KVWMMO	2119.8752.02 ²⁾
Multiviewer control center (MCC)		
Multiviewer control center dashboard – instance license	R&S®PRM-KMCCD	2119.8775.02 ²⁾
Multiviewer control center output view – single license	R&S® PRM-KMCCV	2119.8769.02 ²⁾
Multiviewer control center extension image	software image ³⁾	2119.6995.00
Virtualization/cloud/bare-metal options		
Hypervisor image		
R&S®PRISMON hypervisor image for VMware	software only image ³⁾	2119.9013.00
R&S®PRISMON hypervisor image for KVM	software only image ³⁾	2119.9065.00
Bare-metal image		
R&S®PRISMON software deploying image	software only image ³⁾	2119.7879.00

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