R&S®VidChecker
Audio/Video QC Software

Automatic quality control of file-based audio and video data

ROHDE&SCHWARZ

Broadcasting

Product Brochure | 02.00

R&S®VidChecker Audio/Video QC Software

At a glance

The R&S®VidChecker audio/video QC software analyzes the technical parameters and quality of audio and video data.

R&S®VidChecker, a second-generation quality control solution, provides detailed analysis of technical parameters in file-based audio/video content used in the professional broadcast domain. Tests cover the container layer (e.g. MXF or QuickTime files), bit stream syntax layer (e.g. AVC/H.264 ES) and baseband layer (audio/video/data). Quality analysis detects freeze frames, black frames, blocking artifacts and more.

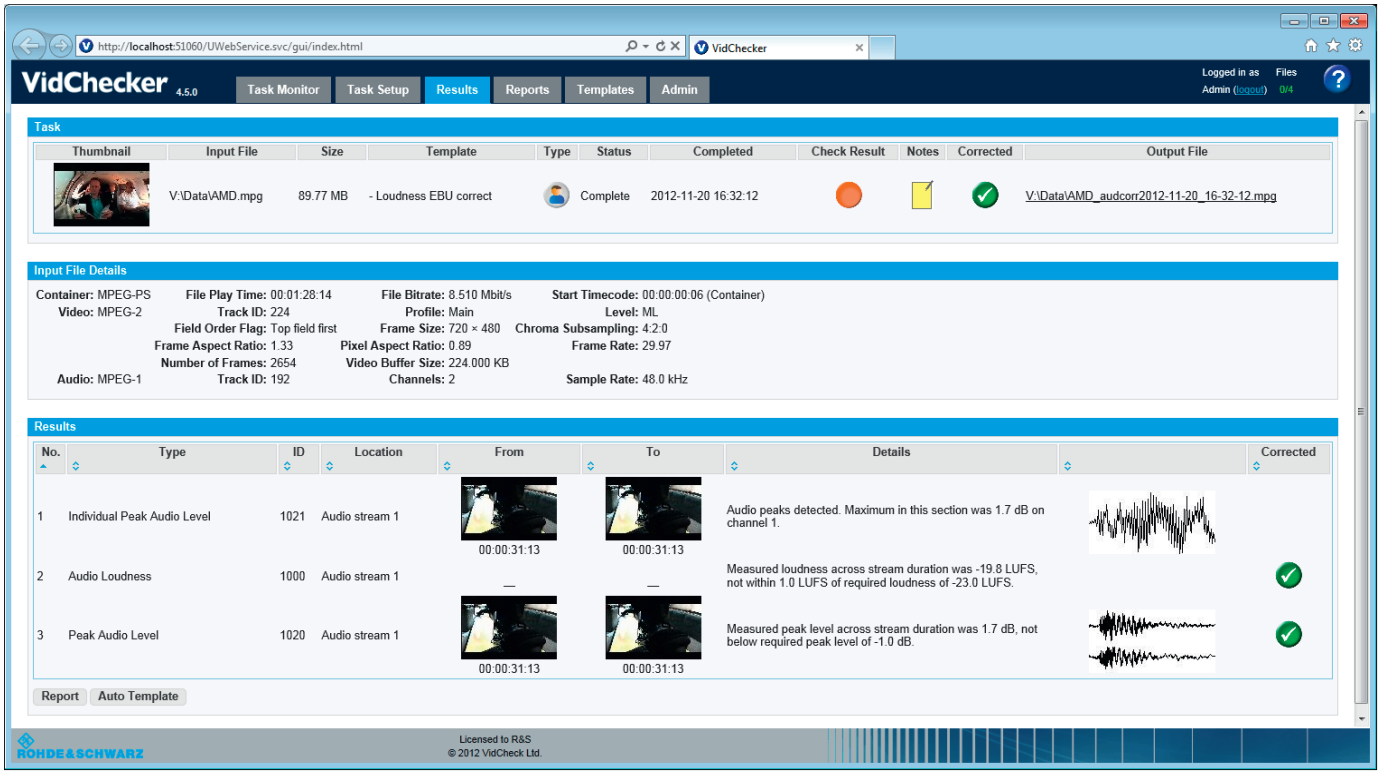
R&S®VidChecker also makes it possible to correct individual video parameters such as video luma level, black level and video RGB gamut. Audio parameters, including loudness according to EBU R128 and ATSC (CALM) and audio levels, can be corrected as well.

R&S®VidChecker is used by broadcasters and video-on-demand service providers for the "incoming inspection" of external audio/video files that are to be processed in an internal infrastructure. In addition, the software is suitable for performing an "outgoing inspection" of the files, typically before they are played out, distributed or archived. This is important for post production houses and content providers who deliver audio/video files to broadcasters.

Key facts

- Quality control of all common audio/video file formats
- Correction of specific audio and video parameters
- Easy integration into workflows (watch folder, web service)
- Scalable to R&S®VidChecker grid
- Straightforward, easy-to-operate graphical user interface

Detailed results view.



R&S®VidChecker Audio/Video QC Software

Benefits and key features

Automated quality control (QC)

- Checking technical parameters by means of templates
- Testing quality parameters

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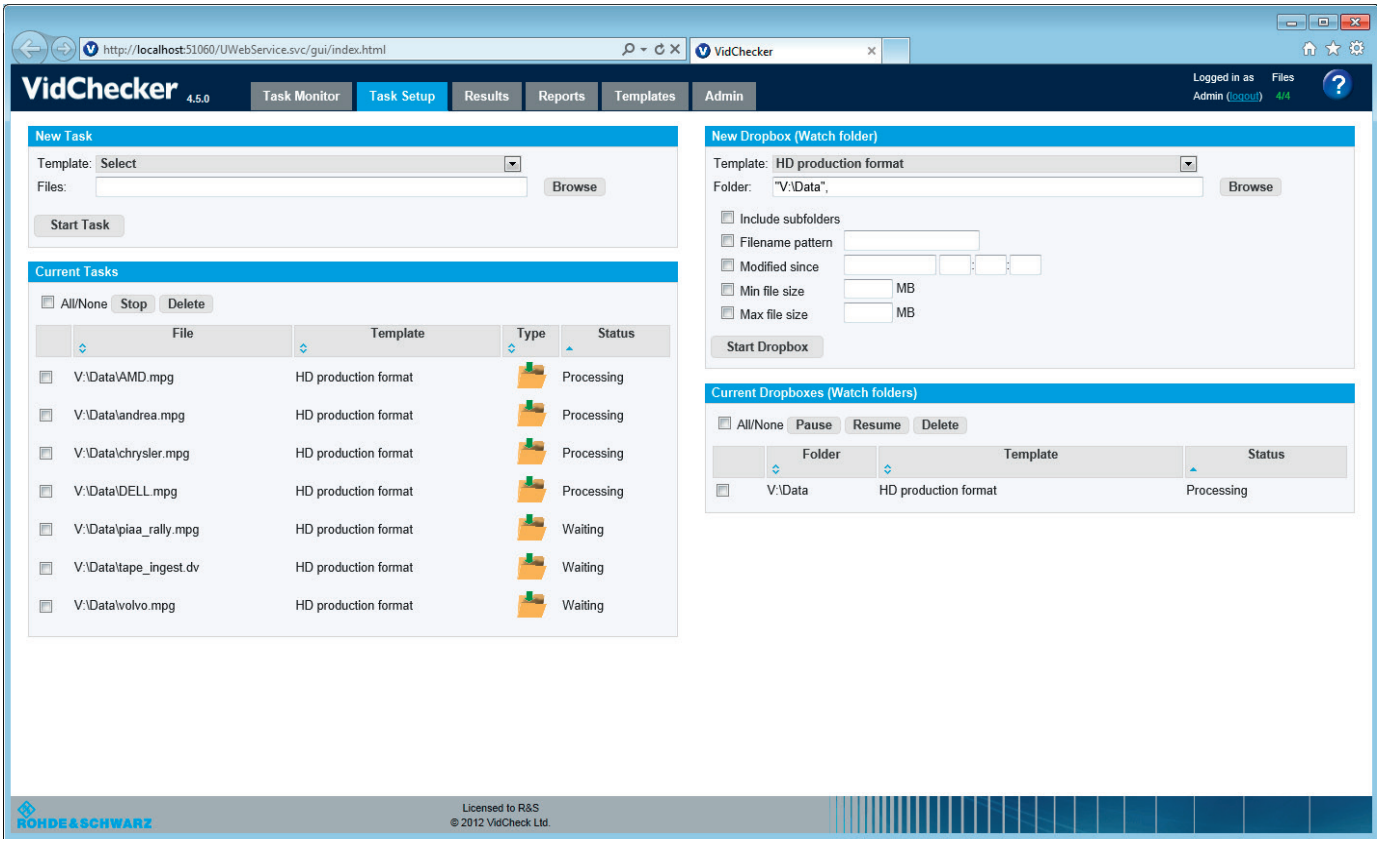
Easy correction and integration

- Correction of individual parameters
- Easy operation via web interface
- Integrability into workflows and scalability

▷ page 5

Setup of tasks and watch folders.



Automated quality control (QC)

Broadcasters and post production houses have to cope with a continually increasing volume of data and an ever growing variety of audiovisual content and file formats. This is why quality control must be automated in an IT-based production environment. Quality control with R&S®VidChecker includes the checking of technical parameters (container and bit stream syntax) and the testing of quality aspects (baseband). Both processes can be flexibly configured by the user.

Checking technical parameters by means of templates

In automated quality control, the first step is to check technical parameters in the container and bit stream syntax layer. Typical examples are the use of specific audio and video codecs, the use of a definable number of audio channels and the existence of specific timecode start values. Users frequently base quality control of the specified parameters on in-house standards, i.e. documents that define a file format to be used internally and the format version. R&S®VidChecker makes it possible to check these in-house standards using templates.

Testing quality parameters

In addition to checking the technical parameters, the audio and video baseband parameters are tested. For this purpose, the coded, available signals are decoded and analyzed in the baseband. The video tests include, for example, detection of color bar signals, all-black pictures, picture freeze, blocking and dropout artifacts, as well as sequences that are critical to photosensitive epilepsy (PSE). In the audio domain, R&S®VidChecker analyzes loudness values (ATSC CALM, EBU R128), minimum/maximum audio level, peak level as well as phase coherence, and detects test tones and audio clipping. Threshold and target values can be defined using templates.

Configuration by means of templates.

Easy correction and integration

Correction of individual parameters

After detecting errors and checking quality parameters in audio/video files, users must be able to respond to deviations, which, in practice, proves to be difficult. R&S®VidChecker now makes it possible to easily correct video parameters such as video luma level (including black level), video chroma level (color limit error) and video RGB gamut (illegal colors), as well as audio parameters such as audio peak level and loudness values (ATSC CALM, EBU R128).

Easy operation via web interface

The intuitive R&S®VidChecker graphical user interface (GUI) makes it easy to configure templates. The browser-based GUI allows users to operate the software locally as well as remotely via other network computers.

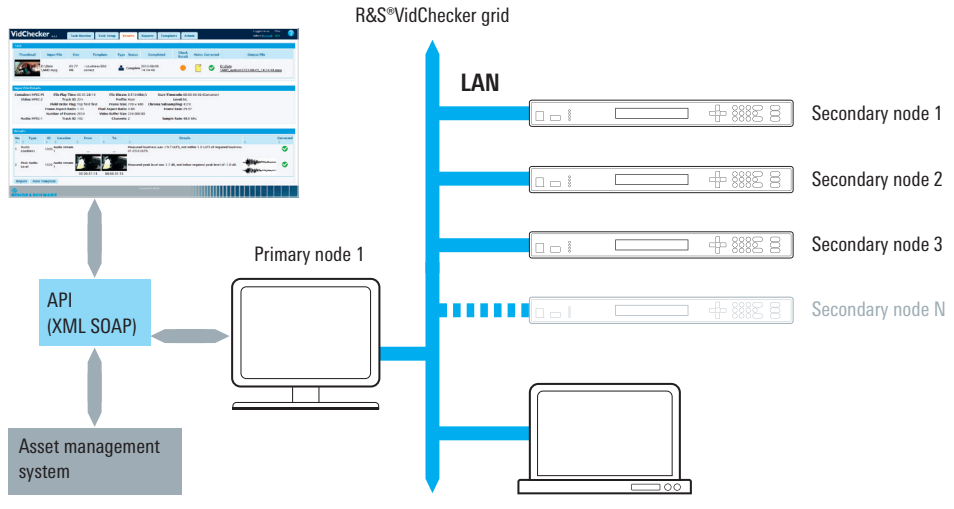
Integrability into workflows and scalability

An R&S®VidChecker instance can analyze up to four files simultaneously, using multicore and multithread characteristics of current CPUs. In large systems, multiple instances are combined to form an R&S®VidChecker grid. For small installations, the R&S®VidChecker Post version is available. This version analyzes one file at a time. R&S®VidChecker can be integrated into existing infrastructure via watch folders (drop boxes) or web service interfaces (API).

Browser-based interface.

Filename	D:\Data\chrysler.mpg
File Size	148,710,104 Bytes
File Bit Rate	8.649 Mbit/s
Container	MPEG-PS
Start Timecode	00:00:00:09
Start Timecode Source	Container
Video Codec	MPEG-2
Profile	Main
Level	ML
Field Order Flag	Top field first
Track ID	224
Frame Width	720 pixels
Frame Height	480 pixels
Frame Aspect Ratio	1.33
Pixel Aspect Ratio	.89
Frame Rate	29.97 frames per second
Chroma Subsampling	4:2:0
Buffer Size	229376 bytes
Number of Frames	4123
Video Duration	137.571 secs
Audio Codec	MPEG-1
Track ID	192
Audio Channels	2
Audio Sample Rate	48.0 kHz
Audio Duration	137.544 secs

R&S®VidChecker grid



Application examples

Outgoing inspection of file-based audio and video data

Nowadays, post production houses have to generate and deliver a wide variety of file formats, codecs and essence formats to different clients. Many broadcasters have their own "in-house format specification" and expect delivered material to be compliant with this specification. It is the responsibility of the post production house to deliver the A/V material in the correct format.

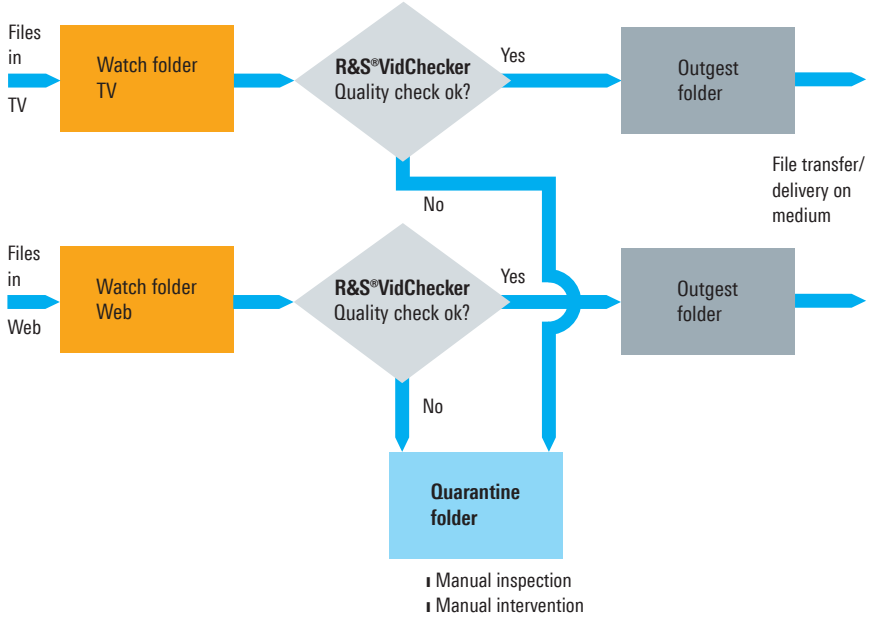
Typically, the content is created once and packaged and delivered to multiple destinations, such as a version for television (e.g. HD/SD video with 5.1 audio mix) and a version for the web (e.g. web video resolution with stereo audio).

R&S®VidChecker can address such requirements by using multiple templates and applying them to multiple watch folders (drop boxes). In the example below, two different templates are being used and applied for quality control of both the television version and the web version.

If the content passes the automated quality check, it will be reviewed (partly) through manual inspection to check parameters that can only be validated by humans. A typical example is checking for correct spelling inside graphics and "the lower third". Such checks require human judgment.

If the content fails the automated quality check, the file can be moved to a special quarantine folder. A detailed error report is available via the R&S®VidChecker browser-based user interface. This error report lists the reason why the quality check failed. One simple but often overlooked problem is the erroneous swapping of different versions to the different output destinations. Such problems can be easily detected with R&S®VidChecker.

Outgoing inspection based on watch folders

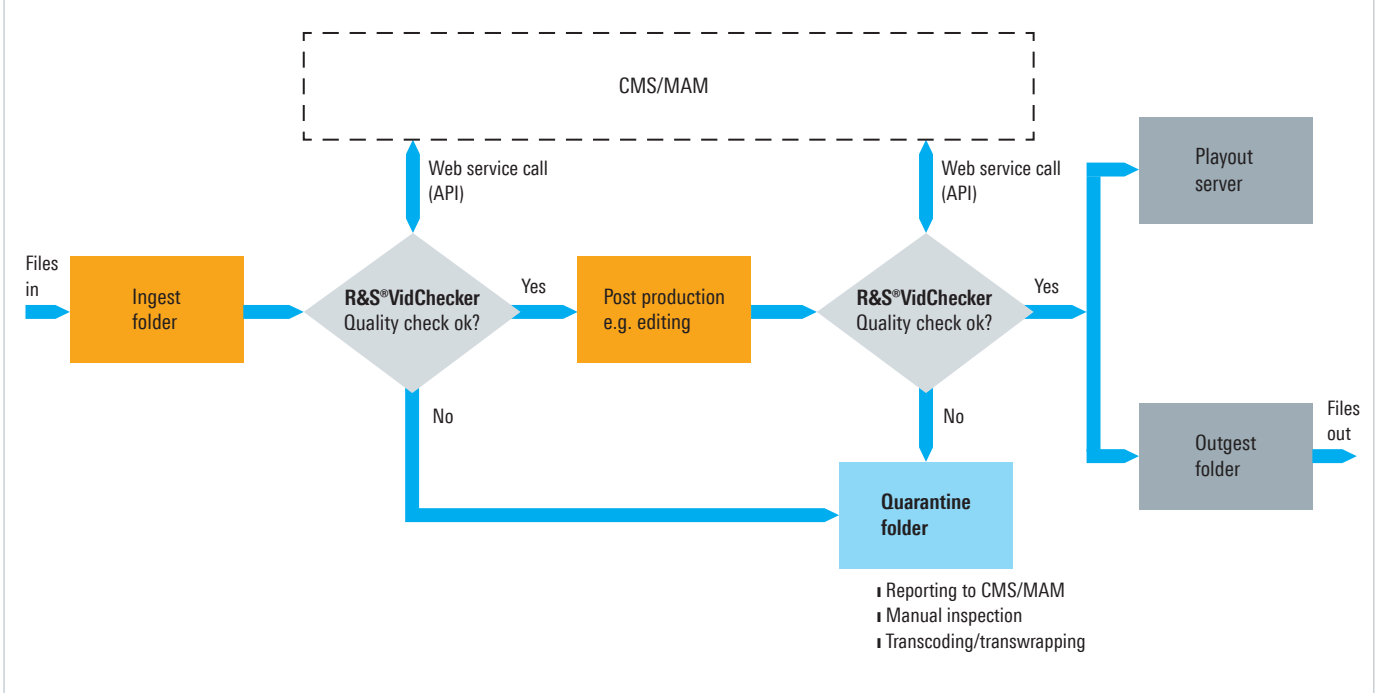


Incoming inspection of file-based audio and video data

In addition to data volume and diversity, the number of "dialects" of known file formats such as MXF is also increasing. After file ingest or data transfer to a broadcaster, an automatic test must be performed to ensure that the files containing audio and video data can be processed. This includes checking compliance with an in-house standard and validating that the audio and video quality fulfills specific minimum requirements.

This scenario can be fully addressed using R&S®VidChecker: Template functionality makes it possible to define specific parameters in the container layer (e.g. MXF or QuickTime files), the bit stream syntax layer (e.g. AVC/H.264 ES) and the baseband layer (audio/video/data). Newly received files can be automatically checked in two ways. The first method involves monitoring a specific ingest directory as a watch folder (drop box, see first application example). New files are automatically checked against a predefined template, and the results are output in a straightforward table. The second method is based on an existing content management system (CMS) or media asset management system (MAM) that administers the audio/video files (see figure below). The CMS or MAM can communicate via the R&S®VidChecker web service interface (API) and can trigger the analysis of new files. The results are transferred to the CMS or MAM in XML format and, if necessary, can be filtered and displayed on the CMS or MAM interface.

Incoming inspection with CMS/MAM integration



Specifications in brief

Specifications in brief	
Container file formats	ASF, AVI, Flash, GXF, LXF, MKV, MOV (QuickTime), MP4, MPEG-2 PS, MPEG-2 TS, MXF
Video codecs	AVC/H.264, DNxHD (VC-3), DVCPRO25, DVCPRO50, DVCPRO100/HD, HDV, MJPEG, MPEG-2 (IMX/XDCAM), RGB (in MOV), ProRes, VC-1, YUV (in MOV)
Audio codecs	AAC, AES, BWF, Dolby Digital AC-3, Dolby Digital Plus, Dolby E, DV, LATM, MPEG-1, MPEG-2, PCM/ADPCM, WAV, WMA
Video checks	AFD, chroma format, clean aperture, enhanced syntax checking, file duration, frame aspect ratio, frame rate, frame resolution, frame size, GOP length, MBAFF, MPEG-2 buffer size, pixel aspect ratio, video bit rate mode (CBR/VBR), video codec
Audio checks	audio bit rate, bit depth, dialnorm, sample rate, track presence
Video quality checks (baseband)	black level, black frames, blockiness, chroma level, color bar detection, field order, freeze frames, letterbox/pillarbox, PSE checks (OFCOM/ ITU-R BS.1702), RGB color gamut, stripe error, video dropout
Audio quality checks (baseband)	audio loss, click and pop detection, clipping, loudness (long term, short term, ATSC, EBU and custom), loudness compliance (EBU R128, ITU-R BS.1770), minimum and maximum levels, peak level, phase detection, PPM audio ballistics, test tone detection
Video correction (baseband)	black level, chroma level, dropouts, RGB color gamut
Audio correction (baseband)	dialnorm, loudness compliance (EBU R128, ITU-R BS.1770), peak level, PPM level
Predefined templates	AS-11/DPP (SD IMX, HD AVC-I), loudness (ATSC, EBU), MPEG-2 SD (NTSC, PAL), MXF (AVC-I 100, IMX 50, XDCAM HD 422), ProRes HQ HD
Number of parallel file analyses per R&S®VidChecker system	4 (R&S®VidChecker), 1 (R&S®VidChecker Post)
Report formats	HTML, XML (incl. XSL)
Integration	via watch folder (drop boxes) and web service (API)

Ordering information

R&S®VidChecker		
Designation	**Type**	**Order No.**
R&S®VidChecker Audio/Video QC Software, incl. MPEG-2 video and MPEG/PCM audio	R&S®VID-K1700	2118.5343
R&S®VidChecker Audio/Video QC Software, incl. MPEG-2 video and MPEG/PCM audio (with re-encode)	R&S®VID-K700	2118.5350
R&S®VidChecker Audio/Video QC Software, grid node	R&S®VID-K3490	2118.5366
Software options (firmware)		
Decoder options		
Add AVC/H.264 Video and AAC Audio	R&S®VID-K1701	2118.5372
Add DVCPRO25, DVCPRO50, DVCPRO100/HDVideo and DV Audio	R&S®VID-K1702	2118.5389
Add Dolby Digital AC-3 and Dolby Digital Plus Audio	R&S®VID-K1703	2118.5395
Add VC1 Video and WMA Audio	R&S®VID-K1704	2118.5408
Add ProRes	R&S®VID-K1705	2118.5414
Add DNxHD	R&S®VID-K1706	2118.5420
Add MJPEG	R&S®VID-K1707	2118.5437
Add Dolby E	R&S®VID-1708	2118.5489
Encoder options		
Add AVC/H.264 Video and AAC Audio (with re-encode)	R&S®VID-K701	2118.5443
Add DV25, DVCPro50, DVCPro100/HDVideo and DV Audio (with re-encode)	R&S®VID-K702	2118.5450
Add Dolby Digital AC-3 and Dolby Digital Plus Audio (with re-encode)	R&S®VID-K703	2118.5466
Add VC1 Video and WMA Audio (with re-encode)	R&S®VID-K704	2118.5472

R&S®VidChecker Post		
Designation	**Type**	**Order No.**
R&S®VidChecker Audio/Video QC Software, incl. MPEG-2 video and MPEG/PCM audio	R&S®VID-K1730	2118.5495
R&S®VidChecker Audio/Video QC Software, incl. MPEG-2 video and MPEG/PCM audio (with re-encode)	R&S®VID-K730	2118.5295
Software options (firmware)		
Decoder options		
Add AVC/H.264 Video and AAC Audio	R&S®VID-K1731	2118.5508
Add DVCPRO25, DVCPRO50, DVCPRO100/HDVideo and DV Audio	R&S®VID-K1732	2118.5514
Add Dolby Digital AC-3 and Dolby Digital Plus Audio	R&S®VID-K1733	2118.5520
Add VC1 Video and WMA Audio	R&S®VID-K1734	2118.5537
Add ProRes	R&S®VID-K1735	2118.5543
Add DNxHD	R&S®VID-K1736	2118.5550
Add MJPEG	R&S®VID-K1737	2118.5566
Add Dolby E	R&S®VID-K1738	2118.5572
Encoder options		
Add AVC/H.264 Video and AAC Audio (with re-encode)	R&S®VID-K731	2118.5308
Add DV25, DVCPro50, DVCPro100/HDVideo and DV Audio (with re-encode)	R&S®VID-K732	2118.5314
Add Dolby Digital AC-3 and Dolby Digital Plus Audio (with re-encode)	R&S®VID-K733	2118.5320
Add VC1 Video and WMA Audio (with re-encode)	R&S®VID-K734	2118.5337

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Environmental commitment

- Energy-efficient products
- Continuous improvement in environmental sustainability
- ISO 14001-certified environmental management system

Certified Quality System
ISO 9001

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