

# RD9000

MULTI-FORMAT PROFESSIONAL DECODER



## The Harmonic RD9000 multi-format professional decoder enables rapid, reliable deployment of eye-catching UHD content for contribution and primary distribution applications.

With a significant increase in UHD TV sets hitting the market, content providers and broadcasters are looking for a solution to address the needs of early adopters. Compact and reliable, the RD9000 real-time professional decoder is the answer. Designed to ensure high performance, the RD9000 delivers pristine UHD for an immersive, high-resolution experience.

### Innovative Technology

RD9000 is software-based multi-format (H.265) professional decoder that is perfect for contribution and primary distribution applications. The platform's software architecture provides content providers and broadcasters with maximum flexibility, which is paramount in today's market.

Contribution encoding is the critical step to achieve a superior end-user experience. With its wide range of encoding tools, HEVC offers incredible compression efficiency, making live UHD delivery achievable for satellite, cable, terrestrial and fiber networks.

Single-slice UHD HEVC technology is a cornerstone of the RD9000, eliminating border compression artifacts and maximizing compression efficiency. This technology is essential to achieving superior video quality in premium contribution applications. In addition, the RD9000 supports HDR (High Dynamic Range) along with WCG (Wide Color Gamut) to ensure drastic contrast and color rendering for "wow" video experience.

Combined with Harmonic's ViBE CP9000 HD/UHD contribution encoder, the RD9000 multi-format professional decoder offers users a pristine UHD contribution solution.

### Versatile and Future-Proof

RD9000 software-based decoder featuring any-format and any-codec is the reference decoder for any contribution and primary distribution use case.

Supporting HDR and WCG via a flexible, software-based design, the RD9000 is future-proof .

RD9000 already supports SMPTE-2110 or SMPTE 2022-6 uncompressed video over IP outputs. Additionally, the RD9000 decoder supports DVB/SMPTE standards and is interoperable with professional encoders.

### World-Class Service and Support

Harmonic stands behind the RD9000 professional decoder with comprehensive service and support programs, including system design, service deployment, technical support and network maintenance. World-class service plans and a global network of flexible and responsive support professionals help ensure our customers can deliver outstanding "anytime, anywhere, any-device" video experiences.

## HIGHLIGHTS

- Up to 4 x HD or 1 x UHD decoding
- Single/multi slice UHD decoder
- Multi-format MPEG-2/H.264/HEVC 4:2:0/4:2:2 8/10 bit
- Two versions up to 80Mbps or up to 160Mbps
- Compact and low-power appliance
- SDR, HDR and WCG BT.2020
- HDMI, 4x3G-SDI or 12G-SDI outputs
- SMPTE 2110 Video over IP outputs
- Down & up-conversion
- Up to 4 x HD or 1 x UHD decoding
- Dual AC PSU



RD9000 rear panel - 12G-SDI, HDMI & 4x3G-SDI outputs



RD9000 rear panel - 4x3G-SDI & SMPTE 2110 outputs

## SPECIFICATIONS

### INPUT/OUTPUT

DVB-S2/S2X	4 x RF input L-Band: 950MHz to 2150MHz QPSK, 8PSK, 16APSK, 32APSK
MPEG over ASI	Up to 4 x ASI inputs
MPEG over IP input	RJ-45 10/100/1000 UDP or RTP SRT input Zixi input CBR or Null-stripped TS RTP & SMPTE-2022/Cop3 FEC Unicast / Multicast IGMP V1/V2/V3 Hitless redundancy SMPTE 2022-7
De-scrambling	BISS 1 mode & E BISS 2 mode 1, E, CA <sup>1</sup>
Outputs	4 x 3G-SDI output & Genlock 12G-SDI & HDMI 2.0 & Genlock 2 x 10G for HD Video over IP SMPTE 2110 2 x 25G for HD/UHD Video over IP SMPTE 2110

### VIDEO PROCESSING

Performances	Two models: RD9020: UHD up to 80Mbps RD9080: UHD up to 160Mbps
Nb of services	1 x UHD or up to 4 x SD/HD
Codec	HEVC / H.265 MPEG-4 / AVC / H.264 MPEG-2
Decoding Profiles	HEVC: Main10 422 Level 5.1 AVC/H.264: Up to Hi422@L4.2 MPEG-2: up to 422@HL
Chroma sampling	4:2:0, 4:2:2
Bit Depth	8, 10-bit
Resolution	3840x2160p (UHD) 1920x1080p 1920x1080i 1280x720p 720x576i 720x480i
Frame Rates	60, 59.94, 50, 30, 29.97, 25, 24, 23.97
Down-up conversion	Any format / frame rate above
HDR	HDR10, PQ10, HLG
Wide Color Gamut	BT.709, BT.2020
Ancillary	Closed Caption EIA-608, EIA08 Teletext OP-47, Transparent SMPTE-2038

### PHYSICAL

Dimensions (H x W x D)	1.7 x 17.2 x 16.9 in (1 RU) 4.3 x 43.7 x 42.9 cm (1 RU)
Weight	26.7 lbs / 12kg
Power Consumption	190 W
Input Voltage	100-240 VAC
Cooling	Front to rear airflow
Features	Dual AC PSU

### ENVIRONMENTAL

Operating Temperature	41° to 104° F 5° to 40° C
Storage Temperature	23° to 113° F -10° to 70° C
Maximum Humidity	90%
Electromagnetic Compliance	CE marked in accordance with the 93/68/EEC (22/07/93) directive EN 55022 EN 55024 EN 61000-3-2
Safety	IEC 60950 and EN 60950 UL 60950

### AUDIO PROCESSING

Performances	Up to 8 audio services per video
Audio codecs	MPEG1 Layer 2 AAC-LC, HE-AAC V1, HE-AAC V2 Dolby® Digital (AC-3, E-AC-3)
Decoding Formats and bitrates	MPEG-1 Layer II 2.0 64-256 kbps AC-3 2.0 128-448 kbps AC-3 5.1 384-640 kbps DD+ (E-AC-3) 5.1 192-448 kbps AAC-LC/HE-AAC 2.0 32-160 kbps AAC-LC/HE-AAC 5.1 96-448 kbps
Output format	Linear PCM Pass-through
Embedded audio	Up to 8 audios per video

### CONTROL AND MONITORING

WEB-browser User interface
Restful API and SNMP for NMX integration
Firmware update via WEB User Interface
RJ-45 Ethernet 10/100/1000

Note 1: check for availability  
Note 2: Front panel not available

## ORDERING INFORMATION

### HARDWARE ELEMENTS

Part Number	Description
RD9020-1U-2AC-SRV	Decoder Up to 4xHD or 1xUHD AVC/HEVC, 4:2:0/4:2:2, up to 80Mbps
RD9080-1U-2AC-SRV	Decoder Up to 4xHD or 1xUHD AVC/HEVC, 4:2:0/4:2:2, up to 160Mbps
RD9x00-HW-SDI	4 x 3G-SDI output & ASI input card
RD9X00-HW-DVBS2X	DVB-S2X card with 4 x RF input
RD9x00-12GHDMI	1 x 12G-SDI & HDMI 2.0 output card
RD9x00-SMPTE	HD over SMPTE 2110 output card, 2x10Gbps
RD9x00-SMPTE-UHD	HD/UHD over SMPTE 2110 output card, 2x25Gbps