

# UHD Professional Receiver Decoder MRD 6000



## OVERVIEW

The MRD 6000 is a new UHD receiver decoder platform built with the latest generation ASIC in order to deliver a reliable, cost-effective multiformat decoder. Perfect for applications such as monitoring, digital-turnaround, digital signage, hospitality and enterprise video delivery.

The MRD 6000 will decode HEVC/H.264/MPEG-2 and output UHD/HD/SD video with 4 audio services (8 audio channels) with all ancillary data required for professional video delivery networks. Input and output options include ASI, MPEG/IP, DVB/S/S2/S2X, and QAM-B/8VSB. Licenses and hardware options for descrambling include with BISS and dual DVB-CI CAM slots.

The MRD 6000 maintains our long tradition of ease of use, with a straight-forward user interface and web APIs and backed by Sencore's best-in-class staff of ProCare support engineers.

## APPLICATIONS

- Primary and Secondary distribution decode
  - UHD and HEVC natively supported, future proof for any application
  - Downscale incoming signals for re-encode
- Monitoring of UHD and 1080P60 signals
- UHD signage, hospitality and enterprise video

## KEY FEATURES

- Multiformat support to decode any stream
  - HEVC/H.264/MPEG-2 up to 4:2:0 10-bit
  - Up to 8 channels of audio processing for MPEG1/2, AAC and Dolby AC3/AC3+
- Input and output options include ASI, MPEG/IP, DVB/S/S2/S2X, and QAM-B/8VSB
- SDI, HDMI and composite outputs
  - 5x 3G-SDI ports
    - 4x3G-SDI for UHD output in four quadrant or 2SI
    - 1x3G-SDI for simultaneous 1080 output
  - HDMI 2.0a connector for UHD and HD outputs

# SPECIFICATIONS

## UHD Professional Receiver Decoder MRD 6000

### VIDEO DECODER

MRD 60002

#### Base Decoding (UHD/4K, HD, SD 4:2:0)

Video Profile/Levels:	MPEG2 MP@HL H.264 up to HP@L4.2 HEVC M10P@MT up to L5.1
Video ES Bitrates:	Up to 40 Mbps for UHD HEVC Up to 100 Mbps+ for H.264 & MPEG2
Frame Synchronization Modes:	PCR-Recovered Clock

Output Formats:	1920x1080p @ 50, 59.94, 60 1920x1080i @ 25, 29.97, 30 1920x1080p @ 23.97, 24, 25, 29.97, 30 1280x720p @ 50, 59.94, 60 720x576i @ 25 720x480i @ 29.97
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#### Output Interfaces:

SD/HD/3G-SDI:	Mirrored 5x 75Ω BNC
SDI Format Support:	3G-SDI Level A
Composite Video Output:	1x 75Ω BNC
	NTSC, PAL, SECAM
Digital Video:	1x HDMI-2.0a Connector

#### 4x3G-SDI Output for 4K/UHD Video Output License MRD 60730

Output Formats:	4096x2160p up to 60 3840x2160 up to 60
Output Interfaces:	4x 75Ω BNC, Quad Link
SDI Link Modes:	4x HD panels or SMPTE 425-5 interleaved (user selectable) 1x 75Ω BNC HD down-convert

#### Base Audio Decoding Features

Number of Audio Services:	2 Standard, Up to 4 Available
Audio Codecs Supported:	Dolby Digital (AC-3) & Plus (EAC-3) AAC-LC, HE-AAC, & HE-AACv2 MPEG1L2 & MPEG2L2
Output Formats:	Digital Pass-through PCM (Downmixed for 5.1 Sources) Analog (Downmixed for 5.1 Sources)

#### Discrete Channel Audio Output License MRD 60851

Adds Output Formats:	PCM (Decoded Discrete channels for 5.1 Sources) Analog (Decoded Discrete channels for 5.1 Sources)
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#### 4x Service Audio Decode License MRD 60840

Additional Audio Services:	2 Services (Total of 4 Services)
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#### Additional Base Video Features

Simultaneous SD Video Output License MRD 60601	Enable Mirrored SD SDI Outputs: 2x 75Ω BNC
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#### Video Overlay Support

Closed Caption Overlays:	CEA-608, CEA-708
DVB-Subtitle Overlays:	HD/SD with Auto Scaling (EN 300743)

#### Base Audio Output Features

AES Outputs:	4x 75Ω BNC
Analog Outputs:	1x 15 pin D-Sub (4 Stereo Services) 4x XLR Breakout Cable Available

SDI Embedded Audio Output:	4x BNC Breakout Cable Available Terminal Block Cable Available 4 Audio Pairs SDI Embedded Audio
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#### Ancillary Data Support

SDI ANC Data Types:	Closed Captions (CEA-708) OP-47 (SMPTE RDD-08) SCTE 127 (SMPTE 2031) EN301775 (SMPTE 2031) SCTE 104
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#### Included Transport Stream Input/Output Features

ASI Input/Output:	2 x 75Ω BNC (selectable in/out)
Supported Bitrate:	250 Kbps to 200 Mbps

#### BISS-1 Descrambling License MRD 60921

Supported Modes:	Mode 0, Mode 1 with Session Word Mode E with SW and Injected ID
Multi-BISS Support:	Up to 12 Separate Keys with License

#### BISS-2/CA Descrambling License MRD 60922

Supported Modes:	Mode 0, Mode 1 with Session Word Mode E with SW and Injected ID Mode CA with Injected Private Key Mode CA with Buried Private Key
Multi-BISS Support:	Up to 12 Separate Keys with License

#### DVB-CI Multi-Service License MRD 60991

With DVB-CI Module:	Enables Multi-service Descrambling
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#### PID/Service Filtering Output License MRD 60928

Filtering:	5 Independent TS (MPTS or SPTS) outputs via IP or ASI
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Table Regeneration (MPEG Mode):	PAT regeneration
Table Pass-through (MPEG Mode):	PMT, CAT, NIT pass-through table
Regeneration (DVB Mode):	PAT, SDT
Table Pass-through (DVB Mode):	PMT, CAT, NIT, EIT, RST, TDT, TOT

#### SCTE 35 to SCTE 104/Relay Output License MRD 60992

#### DVB-CI DESCRAMBLING MODULE MRD 421

Physical Interface:	Adds two DVB-CI CAM Slots
Without Multi-Service License:	Descrambles Decoded Service Only
With Multi-Service License:	Number of Services limited by CAM

#### IP INPUT/OUTPUT MODULE MRD 127

Physical Interface:	2x RJ45, 10/100/1000 Auto-Negotiate
Input Format:	UDP or RTP Constant Bitrate or Null-Stripped RTP Header Extensions Supported SMPTE 2022/CoP3 FEC Supported
Output Format:	UDP, RTP (with License)
IP Encapsulation:	1 to 7 TS Packets per IP Packet
Addressing:	Unicast or Multicast
IGMP compatibility:	Version 1, 2 & 3
Per TS Bitrate:	250 Kbps to 200 Mbps

#### MPEG/IP FEC Output License MRD 60925

Additional Output Formats:	RTP and Header Extensions SMPTE 2022/CoP3 FEC Supported
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# SPECIFICATIONS CONTINUED

## UHD Professional Receiver Decoder MRD 6000

### DVB-S/S2/S2X INPUT MODULE MRD 116A

Physical Interface: 4x 75Ω F-Type  
Frequency Range: 950-2150 MHz  
Symbol Rates: 1-72 MSps with 8PSK/QPSK  
1-60 Msps with 16APSK and higher  
DVB-S Modulation Modes: QPSK (All FEC Rates)  
DVB-S2/S2X Modulation Modes: QPSK/8PSK (All FEC Rates)  
16/32/64APSK (with License)  
LNB Power: Off/13/14/18/19VDC @ 450mA  
Control Tone Support: 22 kHz On/Off  
Supported Roll-off Factors: 0.35, 0.25, 0.20, 0.15, 0.10, 0.05

### DVB-S2/S2X Advanced Feature License MRD 60916

Additional Modulation Modes: 16/32/64APSK (All FEC Rates)  
VCM Demodulation Support  
Multistream Support (Single ISI)

### 8VSB/QAM-B INPUT MODULE MRD 101

Physical Interface: 75Ω F-Type  
Frequency Range: 50-1000 MHz  
Sensitivity: -34 to +40 dBmV (A74 Compliant)  
8VSB Standard: ATSC A/53E  
8VSB Channel Plans: Broadcast  
QAM Standard: ITU Annex B/SCTE DVS-031  
QAM Channel Plans: FCC, IRC, HRC  
QAM Constellations: QAM64, QAM256

### BROADCOM TURBOPSK RECEIVER MODULE MRD 111

Physical Interface: 1x 75Ω F-Type  
Frequency Range: 950-2150 MHz  
Symbol Rates: 1-30 MSps  
DVB-S Modulation Modes: QPSK (All FEC Rates)  
TurboPSK Modulation Modes: QPSK /8PSK (All FEC Rates)

### MANAGEMENT

Connector: RJ-45 10/100 - Auto Negotiating  
Protocols: HTTP and SNMP  
User Interfaces: Full control via web GUI  
Full status and control via front panel  
Automation Interfaces: Full status and control via SNMP  
Configurable SNMP traps  
Web services API available  
Syslog message logging  
Firmware Updates: Via web GUI  
Authentication: Local Login, TACACS+

### DIMENSIONS/POWER

Height: 1 RU, 1.72" (44 mm)  
Width: 1 RU, 17.2" (437 mm)  
Depth: 14.6" (370 mm)  
Power: 100-240 VAC 50/60 Hz  
Supply Options: Single AC Power Supply  
(MRD 60002 option)  
Dual AC Power Supply  
(MRD 60003 option)

### ENVIRONMENTAL CONDITIONS

Operating Temp: 0° to 50°C  
Storage Temp: -40°C to 65°C  
Relative Operating Humidity: <95% (non-condensing)