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The MRD 6000 is a new 4K/UHD receiver decoder built with latest-generation 4K/UHD ASIC decoder technology in order to deliver a reliable, cost-effective appliance for monitoring, turn-around, signage, hospitality and enterprise 4K/UHD video applications.

MRD 6000 will decode and output 4K/UHD video with dual-audio and includes core features required in professional video delivery networks.

Key features include: ASI I/O, MPEG/IP I/O, DVB-S/S2/S2X satellite inputs, QAM/VSB RF receiver, DVB-T/T2, C/C2, & ISDB-T inputs, BISS descrambling, and dual DVB-CI CAM slots

The receiver also maintains Sencore's long tradition of ease of use, with a straight-forward web interface accessible via all major browsers and complete control of the unit via the front panel keypad, and is backed by Sencore's best-in-class staff of ProCare support engineers.

KEY FEATURES

- Decode of pro 4K and consumer UHD formats
Up to HEVC Level 5.1 @ Main10 Profile
Up to 4Kp60 and 2160p60
4:2:0 chroma at 8-bit and 10 bit depths
- HDMI 2.0 and quad 3G-SDI video/audio outputs
- Decode, down-mix and pass-through of 2 simultaneous audio services
Support for all major audio types
AES, analog and embedded audio outputs
- Dual DVB-CI CAM slots (option)
- ASI In/Out + MPEG/IP, Satellite, and RF input options with failover features
- Web and front-panel interfaces

APPLICATIONS

- Monitoring of 4K/UHD video services
- Turn-around and distribution of 4K/UHD TV
- 4K/UHD signage, hospitality and enterprise video

FUTURE FEATURES

- HDR support
- 12G-SDI, SFP, and SDI over IP output options
- Simultaneous HD/SD video output
- Option for 2 additional audios (4 total)
- Closed-caption, TTX, subtitles, and DPI processing
- Transcoded H.264 TS output

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VIDEO DECODER

MRD 60001

Base Decoding (UHD/4K, HD, SD 4:2:0)
Video Profile/Levels: MPEG-2 MP@HL
H.264 up to HP@L4.2
HEVC MP@HT up to L4.1, M10P@HT
up to L4.1
Video ES Bitrates: Up to 40 Mbps
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

Output Interfaces:
SD/HD/3G-SDI: Mirrored 4x 75Ω BNC
SDI Format Support: 3G-SDI Level A
Digital Video: 1x HDMI-type 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, Dual & Quad Link
SDI Link Modes: 4x HD panels or SMPTE 425-5
interleaved (user selectable)

Base Audio Decoding Features

Number of Audio Services: Up to 2 audio services
Audio Codecs Supported: Dolby Digital (AC-3) & Plus (EAC-3)
AAC-LC, HE-AAC, & HE-AACv2
MPEG-1L2 & MPEG-2L2
Output Formats: Digital Pass-through
PCM (Decoded Discrete channels for
5.1 Sources or (Downmixed for 5.1
Sources)
Analog ((Downmixed for 5.1 Sources)
Audio Delay/Advance: Per Service, +100/-35 ms

SCTE 35 to SCTE 104/Relay Output License MRD 60992

Cablelabs ESAM POIS Interface License MRD 60993

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

BISS Descrambling License MRD 60921

Supported Modes: Mode 1, Mode E, Injected ID
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

Base Audio Output Features

AES Outputs: 2x 75Ω BNC
Analog Outputs: 1x 15 pin D-Sub (2 Stereo Services)
2x XLR Breakout Cable Available
2x BNC Breakout Cable Available
Terminal Block Cable Available
SDI Embedded Audio Output: 2 Audio Pairs

PID/Service Filtering Output License

MRD 60928

Filtering: 10 Independent TS (MPTS or SPTS)
created; output via IP or ASI

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

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

DVB-S/S2 INPUT MODULE

MRD 116

Physical Interface: 4x 75Ω F-Type
Frequency Range: 950-2150 MHz
Symbol Rates: 1-45 MSps
DVB-S Modulation Modes: QPSK (All FEC Rates)
DVB-S2 Modulation Modes: QPSK/8PSK (All FEC Rates)
16/32APSK (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 Advanced Feature License

MRD 60916

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

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 Msp 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)



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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)

DVB-T/T2/C/C2/ISDB-T INPUT MODULE

MRD 115

Physical Interface:	1x 75Ω F-Type
Frequency Range:	42-1002 MHz
Bandwidth:	1.7MHz, 5 MHz, 6MHz, 7MHz, 8MHz
Constellations:	
DVB-T:	QPSK, QAM16, QAM64 (All FEC Rates)
DVB-T2:	QPSK, QAM16, QAM64, QAM256 (All FEC Rates)
DVB-C:	QAM16, QAM32, QAM64, QAM128, QAM256 (All FEC Rates)
DVB-C2:	QAM16, QAM64, QAM256, QAM1024, QAM4096 (All FEC Rates)
ISDB-T:	QPSK, QAM16, QAM64 (All FEC Rates)

MANAGEMENT

Connector:	RJ-45 10/100 - Auto Negotiating
Protocols:	HTTP and SNMP
User Interfaces:	Full control via web GUI Full 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

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 (Standard)
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ENVIRONMENTAL CONDITIONS

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