Modular Receiver Decoder

MRD 4400

The MRD 4400 Receiver Decoder is the latest in Sencore's long line of professional integrated receiver/decoders for distribution and monitoring applications. Latest-generation components ensure that the MRD 4400 provides the most complete feature set and the best value for a broad swath of common receiver/decoder applications. The product supports decoding of SD or HD video, encoded as HEVC, H.264 or MPEG2, as well as up to four audio services.

The additional audio handling capability makes the MRD 4400 the perfect solution for video distributors looking to meet upcoming descriptive video requirements, while continuing to support surround, stereo, and SAP services. As customer demands evolve, units purchased for SD decoding can be upgraded to HD via a simple software license, and with the included digital video output, video monitoring is as easy as finding the nearest standard consumer television or PC monitor.

With built-in ASI input/output capability, as well as available satellite and IP interfaces, the MRD 4400 is adaptable to most decoder use cases. The receiver also maintains Sencore's long tradition of ease of use, with a 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 ProCare support.

KEY FEATURES

- Support for All Common Video Formats

  √ HEVC, H.264, MPEG2 HD or SD video

  √ All formats auto-detected and switchable on-the-fly
- Up to 4 services of audio decoding or SDI pass-through with support for all major audio formats
- Dual SDI auto-switching outputs
- Built-in ASI I/O for maximum value and flexibility
- Available 8VSB/QAM-B, IP, RF satellite and DVB-T/T2/C/C2/ISBD-T inputs
- Full complement of ancillary data output in ANC and VBI
- Closed-caption or auto-scaling subtitle overlays for monitoring or burn-in applications
- Intuitive, straightforward web interface
- Full control, status, and alarm monitoring via SNMP

APPLICATIONS

- **Turn-around and Back-haul Distribution Feeds**
  Receive network and live feeds via RF, ASI, or IP, and simultaneously demodulate, de-encapsulate, encapsulate, and decode for local processing and re-encode requirements.
- **Upgrade Existing Installations**
  Replace existing receiver decoders to meet emerging video distribution challenges, including the need for more audio services or the transition to HEVC. Experience industry-leading ease of use and interoperability coupled with low cost of ownership.
- **Monitor Any Video Feed**
  Leverage quick set-up and automatic, decode-anything operation to monitor video feeds operationally or in an engineering lab.

SPECIFICATIONS
Modular Receiver Decoder MRD 4400

AVAILABLE VIDEO DECODER MODULES

MRD 44041	**ASI I/O, SDI and Analog Outputs, Discrete Audio, Genlock Support**
MRD 44040	**ASI I/O, SDI and Analog Outputs, Discrete Audio**
MRD 44001	**ASI I/O, SDI Outputs, and Genlock Support**
MRD 44000	**ASI I/O and SDI Outputs**

Additional Discrete Interfaces (available on MRD 44041 and 44040)

Composite Video Output:	1x 75Ω BNC NTSC, PAL-B/G/I/D/M/N
AES Audio Outputs:	4x 75Ω BNC
Analog Audio Outputs:	2x 15 pin D-Sub (4 Stereo Services) 4x XLR Breakout Cable Available 4x BNC Breakout Cable Available Terminal Block Cable Available

Genlock Interface (available on MRD 44041 and 44001)

Genlock Input:	1x 75Ω BNC

COMMON VIDEO DECODER FEATURES

Base Decoding (SD 4:2:0)

Video Profile/Levels:	MPEG2 MP@ML H.264 up to MP@L3

HEVC Decode License MRD 44765

Enables HEVC Decoding:	Requires MRD 44265 Option

HD Decoding License MRD 44710

Additional Profile/Levels:	MPEG2 MP@HL H.264 up to HP@L4.2 HEVC up to MP@MT L4 (with License)
Additional Output Formats:	1920x1080i @ 25, 29.97, 30 1920x1080p @ 23.97, 24, 25, 29.97, 30 1280x720p @ 50, 59.94, 60

Additional Base Video Features

Frame Synchronization Modes:	PCR-Recovered Clock Genlock Reference (If Supported)
Aspect Ratio Conversion	
Manual Selection:	Letterbox, Center-Cut, Anamorphic
Automatic Selection:	Follows AFD Codes
Output Formats:	720x576i @ 25 720x480i @ 29.97
Output Interfaces:	
SD/HD-SDI:	2x 75Ω BNC
SDI Format Support:	Determined by Decode License
Digital Video:	1x HDMI-type Connector

Simultaneous SD Video Output Module MRD 600

Mirrored SD SDI Outputs:	2x 75Ω BNC
Composite Video Output:	1x 75Ω BNC NTSC, PAL-B/G/I/D/M/N

Simultaneous SD Video Output Module with Genlock MRD 601

Mirrored SD SDI Outputs:	2x 75Ω BNC
Composite Video Output:	1x 75Ω BNC NTSC, PAL-B/G/I/D/M/N

HEVC Decoding Daughter Board MRD 44265

Enables HEVC Licensing:	Requires MRD 44765 License for decoding functionality

Video Overlay Support

Closed Caption Overlays:	CEA-608, CEA-708, or SCTE-20
DVB-Subtitle Overlays:	HD/SD with Auto Scaling (EN 300743)

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 Linear PCM & Dolby E (Pass-through)
Output Formats:	Digital Pass-through PCM (Downmixed for 5.1 Sources) Analog (Downmixed for 5.1 Sources)

Discrete Channel Audio Output License MRD 44851

Adds Output Formats:	PCM (Decoded Discrete channels for 5.1 Sources) Analog (Decoded Discrete channels for 5.1 Sources)

4 Service Audio Decode License MRD 44840

Additional Audio Services:	2 Services (Total of 4 Services)

Base Audio Output Features

SDI Embedded Audio Output:	4 Audio Pairs

Ancillary Data Support

SDI ANC Data Types:	AFD (SMPTE 2016) Closed Captions (CEA-708) OP-47 (SMPTE RDD-08) SMPTE RDD-11 SCTE 127 (SMPTE 2031) EN301775 (SMPTE 2031) Time Code (SMPTE 12M-2) SCTE 104 (SMPTE 2010 with License)
VBI Waveforms (SDI/Composite):	Line 21 Captions (CEA-608) TVG2X, AMOL-48/96 (SCTE-127) Teletext/WSS/VPS (EN301775)

SCTE 35 to SCTE 104/Relay Output License MRD 44992

Cablelabs ESAM POIS Interface License MRD 44993

Included Transport Stream Input/Output Features

ASI Input/Output:	2 x 75Ω BNC
Supported Bitrate:	250 Kbps to 200 Mbps

BISS Descrambling License MRD 44921

Supported Modes:	Mode 1, Mode E, Injected ID
Multi-BISS Support:	Up to 12 Separate Keys

DVB-CI Multi-Service License MRD 44991

With DVB-CI Module:	Enables Multi-service Descrambling

PID/Service Filtering License MRD 44928

Filtering:	10 Independent TS (MPTS or SPTS) created; output via IP or ASI
Table Regeneration (DVB Mode):	PAT regeneration
Table Pass-through (DVB Mode):	PMT, CAT, NIT pass-through Table
Regeneration (DVB Mode):	PAT, SDT
Table Pass-through (DVB Mode):	PMT, CAT, NIT, EIT, RST, TDT, TOT

SPECIFICATIONS CONTINUED
Modular Receiver Decoder MRD 4400

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)
MPE De-encapsulation:	Up to 2 PIDs Up to 60Mbps per MPE PID
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 44925

Additional Output Fomarts:	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 44916

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 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 44916

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, QAM25

BROADCOM TURBOPSK INPUT 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 controlvia 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 36-72 VDC
Supply Options:	Single AC Power Supply (Standard) Dual AC Power Supply Single DC Power Supply

ENVIRONMENTAL CONDITIONS

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