

# Modular Receiver Decoder

MRD 4400



The new 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 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 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 44041A ASI I/O, SDI and Analog Outputs, Discrete Audio, Genlock Support

MRD 44040A ASI I/O, SDI and Analog Outputs, Discrete Audio

MRD 44001A ASI I/O, SDI Outputs, and Genlock Support

MRD 44000A 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)  
Digital Pass-through  
PCM (Downmixed for 5.1 Sources)  
Analog (Downmixed for 5.1 Sources)

Output Formats:

**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 (selectable in/out)

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

### 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

### 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

<b>MPEG/IP FEC Output License</b> <span style="float: right;">MRD 44925</span>	
Additional Output Fomarts:	RTP and Header Extensions SMPTE 2022/CoP3 FEC Supported

### 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

<b>DVB-S2 Advanced Feature License</b> <span style="float: right;">MRD 44916</span>	
Additional Modulation Modes:	16/32/64APSK (All FEC Rates) VCM Demodulation Support Multistream Support (Single ISI)

### 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 control via front panel
Automation Interfaces:	Full status and control via SNMP Configurable SNMP traps Web services API available Syslog message logging Via Web GUI
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)