



**Atlas MRD 3187B
Modular Receiver Decoder**



Applications

Contribution Reception and Turn-Around

Receive network and live feeds via RF, ASI, or IP, and simultaneously demodulate, de-encapsulate, encapsulate, and/or decode to multiple formats of your choice for local processing and re-encode requirements.

Local Reception and Integration

Receive local content off-air or through fiber feeds and simultaneously provide compressed and decoded/downconverted outputs to feed your distribution network.

Backhaul and Interconnection

Easily convert transport streams from RF carriers, to serial transport streams, or to/from IP datagram's to seamless transfer content through your network.

Advanced Digital Queue Tone Support

Retain commercial ad avails through the re-encode chain by receiving the SCTE35 messages, converting them to SCTE104 messages, and embedding them in the VANC of the SDI output.

Atlas MRD 3187B Multi-Format SD/HD Modular Receiver Decoder

The Atlas Modular Receiver Decoder (MRD) is the industry's only professional multi-format modular receiver decoder available today. Installed by more broadcast, cable, satellite, and telco service providers, and across a wider range of applications than any other multi-format receiver decoder. The Atlas MRD sets the standard for performance, scalable functionality and cost of ownership. The award winning architecture of the Atlas MRD adapts to changes well beyond any integrated receiver decoder, allowing hardware and software features to be upgraded in the field (often while still in the rack).

The Atlas MRD supports innumerable applications by combining dual-channel processing capability with MPEG-2, MPEG-4, 4:2:0, 4:2:2, SD, and HD video decoding. With the wide range of interfaces, the Atlas MRD adapts to virtually any contribution, distribution, or backhaul environment while allowing easy upgrade paths to future technologies. All of this is what makes the Atlas MRD the only choice for operators seeking a truly future-proof solution. The Atlas MRD 3187B is the next-generation Modular Receiver Decoder from Sencore. The Atlas MRD 3187B expands the functionality of the award winning Atlas MRD 3187A by adding features such as DVB-CI and SCTE35/104 messaging support.

Key Features

Versatile Modular Platform

Avoid getting trapped by proprietary integrated solutions. Preserve capital investments by purchasing only the functions required today, and seamlessly scale to the functionality needed tomorrow.

Future-Proof Interface Upgrades

As new technologies emerge for next generation contribution links, the MRD's interface options and backplane routing architecture make the transitions simple and cost effective.

Wide Range of Inputs and Outputs

The Atlas MRD can support multiple inputs and outputs for seamless integration into a wide variety of system architectures.

Easy System Integration

The SNMP MIB is integrated with many of the industry's most popular automation and network equipment management and monitoring systems.

Multiple Channel Processing

The Atlas MRD supports up to two decoders. These decoders can be configured as two completely independent receiver decoder systems to decode two separate channels. Or, they can be configured to process the same channel twice, providing an HD and SD output simultaneously from an HD source.

Atlas MRD 3187B Modular Receiver Decoder



Atlas Modular Receiver Decoder Solutions

The Atlas Modular Receiver Decoder solutions provide operators a choice of I/O options you require today, and the flexibility to easily change in the future. The modular design of the Atlas MRD 3187B allows you to customize a compact, modular chassis with a variety of input and output modules, including: RF Input, Transport Stream I/O, video and audio decoding.

Multi-Standard Video Decoding Support

The Atlas MRD 3187B is capable of decoding all MPEG-2 and H.264 Transport Streams from Simple Profile through High Level, including 4:2:0 and 4:2:2. It also supports all ATSC formats. Analog options include: NTSC and RGB/YPbPr. Digital video options include SD/HD SDI. The MRD3187B adds DVB-CI and SCTE35/104 messaging support to Atlas MRD platform.

Multi-Standard Audio Decoding

The MRD 3187B lets you choose either digital or analog audio outputs in a variety of connector options. You also have the ability to decode MPEG Audio, Dolby AC-3, Dolby-E, AAC and HE-AAC Audio. Decoded audio can also be embedded in HD/SD SDI.

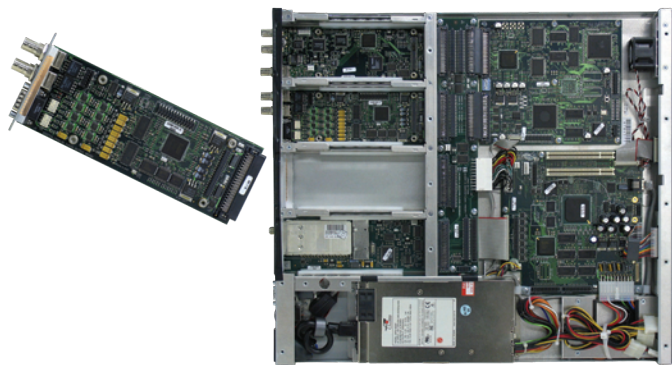
Not Just A Receiver Decoder

The MRD 3187B enables operators to gain valuable information about the decoded video and audio signal. The video and audio bitrate, aspect ratio, native format, and other useful information can be viewed to verify the quality of the decoded signal.

Selected PSIP data can be decoded and viewed, allowing quick verification of PSIP data presence, as well as verification of the content of each PSIP table.

Complete Remote Operation

In addition to providing a variety of input and output options, the MRD 3187B provides signal monitoring capabilities that can be accessed remotely through an easy-to-use SNMP protocol via an Ethernet or Serial port. MRDs can be reconfigured remotely through SNMP or the most intuitive web client in the industry.



Up to 6 Optional I/O Cards can be inserted into the unit

Atlas MRD 3187B Card Options

RF Input Card Options

- ATSC Broadcast Input** (8701A)
Single Input Port, 8-VSB and 64/256 QAM-B Demodulation
- DVB-S/S2 Satellite Input** (8710A)
Dual Input Ports, DVB-S QPSK Demodulation, DVB-S2 QPSK, 8PSK Demodulation
- ASM Receiver Card** (8711)
Dual Input Ports (Turbo PSK, DVB-S PSK)
- DVB-T/COFDM Broadcast Input** (8715)
Dual Input Ports, QPSK, 17/64 QAM Demodulation, 2K & 8K FFT Sizes

Serial Input/Output Card Options

- ASI/SMPTE 310M Input and Output** (8702)
Selectable ASI or S-310M Serial Format, Output from Internal TS Bus

IP Input/Output Card Options

- 10/100/1000 MPEG over IP Input/Output** (8725)
Transmits and Receives Multiple Streams Simultaneously, Supports Pro-MPEG COP3 FEC, IGMPv2/v3, H RTP, and Null-Stripped VBR.
- Dual MPEG over IP Input/ UDP Output** (8727)
Transmits and Receives Multiple Streams Simultaneously Supports Pro-MPEG COP3 FEC, IGMPv2/v3, H RTP, and Null-Stripped VBR. Output is UDP transport protocol

Video/Audio Output Card Options

- Component/Composite Video Output** (8706A)
Component or Composite Video Outputs, Configurable Component/RGBHV Output
- Discrete Analog and Digital Audio Outputs** (8707A)
Simultaneous Analog and AES Audio Outputs, Supports Two Stereo Pair on both Analog and Digital Outputs
- 2 HD/SD-SDI, 1 Component/Composite Video Output** (8708)
Simultaneous HD/SD-SDI and Component/Composite Outputs Two Mirrored HD/SD-SDI Output Connectors and one Configurable Component (RGBHV/YPbPr) or Composite Output

Decoder Card Options:

- MPEG-2/MPEG-4 4:2:0 SD/HD Decoder** (8732)
Single Video Program Decoder MPEG-2/MPEG-4 Auto Sensing, Two Audio Services Supported Decoding/Downmix/Pass-through for Multiple Audio Compression Types
- MPEG-2 4:2:0 SD/HD Decoder** (8730A)
MPEG-2 only version of 8732 decoder
- MPEG-2/MPEG-4 4:2:0 SD/HD Genlock Decoder** (8734)
Single Video Program Decoder MPEG-2/MPEG-4 Auto Sensing, Two Audio Services Supported Decoding/Downmix/Pass-through for Multiple Audio Compression Types, Genlock Support from Black-and-Burst or Tri-Level References
- MPEG-2 4:2:0 SD/HD Genlock Decoder** (8731A)
MPEG-2 only version of the 8734 decoder
- MPEG-2 4:2:2 SD/HD Genlock Decoder** (8733)
Simultaneous HD and Down-converted SD Outputs from an HD Source, Single Video Program Decode, Four Audio Services Supported Decoding/Downmix/Pass-through for Multiple Audio Compression Types, Genlock Support from Black-and-Burst or Tri-Level References

Decryption Card Options:

- DVB Common Interface and BISS Decryption Option** (8721)
Dual DVB-CI CAM Slots, Multiple Program Decryption Support, Support for All Major CAMs and Encryption Systems, BISS 1 & E Decryption Support

General Purpose Card Options

- GPIO Module Card.** (8713)

SENCORE

ATLAS *Modular Receiver Decoder*

MRD 3187B



Configuration Guide

Configuration Guide

The MRD 3187B is an extremely versatile piece of equipment and in order to further expand its capabilities its internal setup can be factory configured in a number of different ways.

Configuration 1 “Config 1” (No Decoder)

This configuration slaves the internal backplanes to one another but provides no decoded video output. The placement of input cards can be in both RDS1 and RDS2 (Slots 1-2, 1-3, 1-4, 2-2, 2-3, 2-4). No video output cards may be installed. This configuration is usually used as a satellite receiver or in combination with an MPEG/IP card to encapsulate the TS from the active input and transmit it via IP.

Configuration 1 “Config 1” (Single Decoder)

This configuration slaves the internal backplanes to one another and provides one video output. The placement of input cards can be in both RDS1 and RDS2 (Slots 1-2, 1-3, 1-4, 2-2, 2-3, 2-4). Video outputs cards may only be placed in slot 1-1. This configuration allows for the tuning of two independent audio services. Only one input may be active and only one program decoded at any time.

Configuration 1 “Config 1” (Dual Decoder)

This configuration slaves the internal backplanes to one another and provides two mirrored video outputs. The placement of input cards can be in both RDS1 and RDS2 (Slots 1-2, 1-3, 1-4, 2-2, 2-3, 2-4). Video outputs cards may be placed in slots 1-1 and 2-1. This configuration allows for the tuning of four independent audio services. This configuration is commonly used to provide an HD and SD video output from the same input signal. Only one input may be active and only one program decoded at any time.

Configuration 2 “Config 2” (No Decoder)

This configuration utilizes the internal backplanes independent from one another allowing one MRD to input two independent inputs simultaneously. With this configuration, the MRD essentially acts like two configuration 1 no decoder units in the in the rack space of one MRD. One input per RDS can be active.

Configuration 2 “Config 2” (Single Decoder)

This configuration utilizes the internal backplanes independent from one another. This configuration operates identical to a configuration 1 unit except for input cards placed in RDS2 (Slots 2-2, 2-3, 2-4) cannot be decoded. A popular use of this configuration is to place an RF card and an ASI card (i.e. 8701A and 8702) in RDS2 to provide RF input and ASI output to act as an 8-VSB or satellite receiver. The bottom RDS may then be used independently to decode a different independent input.

Configuration 2 “Config 2” (Dual Decoder)

This configuration utilizes the internal backplanes independent from one another allowing one MRD to input and decode two independent inputs simultaneously. With this configuration, the MRD essentially acts like two configuration 1 single decoder units in the in the rack space of one decoder. One input per RDS can be active and decode unique video simultaneously.

Slot Configuration

Total Slots = 8

Input Slots = 6

- 2 of which can be used for audio cards

Output Slots = 2

Input Slots

1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4

- 8701A
- 8702
- 8703
- 8710/10A
- 8711
- 8715
- 8725
- 8727

Video Slots

1-1 and/or 2-1

- 8704A/04B
- 8705A
- 8706A
- 8708
- 8712

Audio Slots

1-2 and/or 2-2

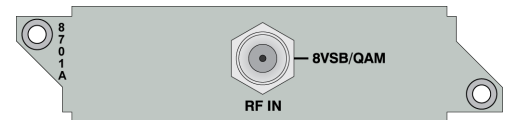
- 8707A

Option Card Overview

8701A – 8VSB / QAM Receiver

Configuration Information:

- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- A or B Chassis



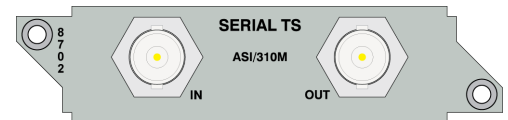
General Description:

This card will receive a TS that is demodulated from an 8VSB signal or it will demodulate a QAM64B or QAM256B RF input. With an 8VSB input, the card will tune to channels 2 – 69. With a QAM input, the card will tune to channels 2 – 134 in three cable frequency bands (FCC, IRC, and HRC). The MRD 3187B will show a valid input if the following conditions are met: the receiver equalizer and the FEC are locked. If the RF level is lower than the “Low Warning Setting” or the MER is lower than the “Low MER Warning Setting,” the red “Error” LED will illuminate on the front panel and there will be an error recorded in the Error List.

8702 – Serial TS I / O (DVB-ASI / SMPTE310M)

Configuration Information:

- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- A or B Chassis



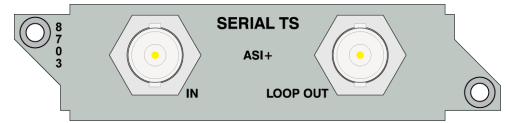
General Description:

This card will receive a TS from either a DVB-ASI input or a SMPTE 310M input. Only one format may be selected at a time. For an ASI input, the bitrate of the TS must be between 1.5Mb/s and 160Mb/s. For a SMPTE 310M input, the bitrate of the TS must be 19.392658Mb/s. The selected input format will also be the output format. The 8702 card can also be used as a TS output for any of the other input cards.

8703 – High Bit Rate Serial TS Input / Loop out (DVB-ASI)

Configuration Information:

- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- A or B Chassis



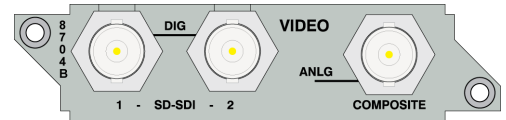
General Description:

This card will receive, up to a 160Mb/s MPTS on ASI. This card is equipped with a passive loop-through to allow the TS to be passed through the card without altering the stream. The loop-through on this card cannot be used to output a TS from a different input card. When the loop-through output is not in use it should be terminated with a 75 Ohm terminator.

8704A / 04B – Video Output (2 SD-SDI , 1 Composite)

Configuration Information:

- Maximum of 2 per unit
- Slot 1-1, and/or 2-1
- A or B Chassis



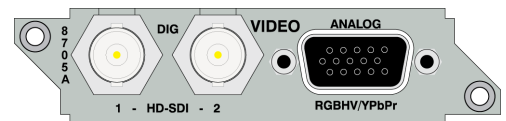
General Description:

A standard definition video output card. It provides two mirrored serial digital (SMPTE 259M) outputs and one composite NTSC & PAL output. Four pairs of audio can be embedded into the serial output on group 1 and 2. Closed captioning found within the transport (608/708B) can be embedded into the serial video output. NTSC closed caption, detected in the transport stream, can be inserted on line 21.

8705 / 05A – Video Output (2 HD-SDI, 1 RGBHV/YPbPr)

Configuration Information:

- Maximum of 2 per unit
- Slot 1-1, and/or 2-1
- A or B Chassis



General Description:

A high definition video output card. It provides two mirrored serial digital (SMPTE 292M) outputs and one analog component video output (RGBHV or YPbPr). Four pairs of audio can be embedded into the serial

output on group 1 and 2. Closed captioning found within the transport (608/708B) can be embedded into the serial video output.

8706A – Video Output (1 RGBHV/YPbPr, 1 Composite)

Configuration Information:

- Maximum of 2 per unit
- Slot 1-1, and/or 2-1
- A or B Chassis



General Description:

An analog only video output card that can output either high definition or standard definition formats. Two outputs are on the card: one BNC for composite (NTSC & PAL) and one 15-pin D-sub for component (RGBHV or YPbPr). The card outputs an SD or HD signal, one at a time. Closed caption (NTSC), detected in the transport stream, can be inserted on line 21 of the composite (NTSC video) output.

8707A – Audio Output (Dolby E, AES Digital, Analog)

Configuration Information:

- Maximum of 2 per unit
- Slot 1-2, and/or 2-2
- A or B Chassis



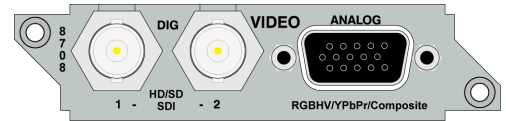
General Description:

This card allows the output of both Digital-AES and analog audio. Each digital audio output can be set to either Raw or PCM. In Raw, the compressed audio for the selected PID is passed through to the digital output. Typically this setting is used to pass-through the Dolby AC-3 compressed digital signal. When the digital audio output is set to PCM, two-channel linear coded PCM AES/EBU audio is output to the digital output. The analog output provides two-channel (L, R) decoded analog audio from the selected audio processor. The two audio processors on the decoder board, feeding the two digital outputs, can process or decode Dolby AC-3, MPEG Layer 1, or MPEG Layer 2 formats. The audio processor will self-sense which type of audio is in the TS. The 8707A also has a Dolby E parsing feature.

8708 – Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp)

Configuration Information:

- Maximum of 2 per unit
- Slot 1-1, and/or 2-1
- B Chassis Only



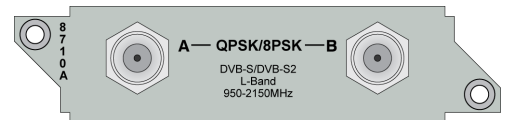
General Description:

A versatile video output card. It provides two user selectable serial digital (SMPTE 259M, or SMPTE 292M) outputs and one component RGBHV or YPbPr/Composite NTSC & PAL output. Four pairs of audio can be embedded into the serial output on group 1, and 2. Closed captioning found within the transport (608/708B) can be embedded into the serial video output. NTSC closed caption, detected in the transport stream, can be inserted on line 21.

8710 / 10A – Dual Input DVB-S/DVB-S2 Receiver

Configuration Information:

- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- A or B Chassis



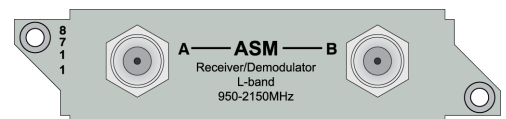
General Description:

This card will input a satellite L-band (950MHz – 2150MHz) signal for demodulation of KU-band or C-band DVB-S QPSK signals or DVB-S2 QPSK/8PSK signals. The symbol rate ranges from 1MSym/s to 45MSym/s for DVB-S and 1-30MSym/s for DVB-S2. This card does not provide any power to the dish LNB. The “Input” LED will only illuminate if the card detects frequency, symbol rate, FEC lock (Carrier Lock), and TS sync (Sync Lock). The card provides A and B inputs, which may be independently configured, but only one may be active at a time.

8711 – Dual Input ASM Receiver

Configuration Information:

- Requires 7.1.1 +
- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- B Chassis Only



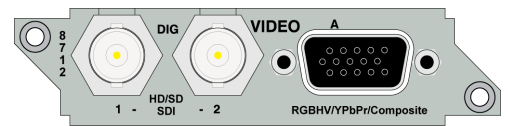
General Description:

This card will input a satellite L-band (950MHz – 2150MHz) signal for demodulation of KU-band, C-band, or X-band DVB-QPSK, 8PSK, or Adv-QPSK signals. All these modes are available using Turbo Coded forward error correction. The DVB-QPSK mode also supports legacy DVB FEC. The symbol rate ranges from 0.256MSym/s to 30MSym/s for all modulation types. This card does not provide any power to the dish LNB. The “Input” LED will only illuminate if the card detects frequency, symbol rate, FEC lock (Carrier Lock), and TS sync (Sync Lock). The card provides A and B inputs, which may be independently configured, but only one may be active at a time.

8712 – Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp)

Configuration Information:

- Maximum of 1 per unit
 - Requires 8733 Decoder
 - Must be Configuration 1
- Slot 2-1
- B Chassis Only



General Description:

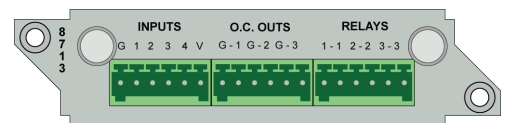
A versatile video output card. It provides two user selectable serial digital (SMPTE 259M, or SMPTE 292M) outputs and one component RGBHV or YPbPr/Composite NTSC & PAL output. Eight pairs of audio can be embedded into the serial output on group 1, 2, 3 and 4. Closed captioning found within the transport (608/708B) can be embedded into the serial video output. NTSC closed caption, detected in the transport stream, can be inserted on line 21.

Note: This card requires the 8733 decoder board.

8713 – GPIO Module

Configuration Information:

- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- A or B Chassis



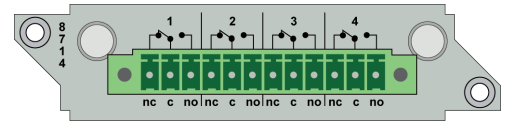
General Description:

This module is considered a global unit option. In other words, the inputs and outputs of a single installed module can be accessed by functions associated with general system features, or RDS specific features in any unit configuration. Only one GPIO module can be installed in a unit.

8714 – Relay and DPI Trigger

Configuration Information:

- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- A or B Chassis



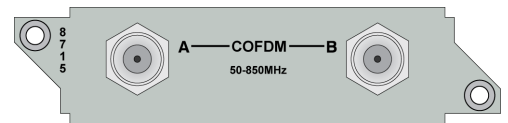
General Description:

This card is a single-slot module and should be considered a global unit option. In other words, the relays of a single installed module can be accessed by functions associated with general system alarms, or RDS specific features in any unit configuration.

8715 – Dual Input COFDM Receiver

Configuration Information:

- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- A or B Chassis



General Description:

This card will input a (49 – 861 MHz) COFDM signal for use in electronic news gathering (U.S.) or any COFDM Terrestrial Broadcast (DVB-T, European) applications. The card provides A and B inputs, which may be independently configured, but only one may be active at a time.

8721 – CAM Decryption

Configuration Information:

- Maximum of 1 per unit
- Factory installed option
- B Chassis Only

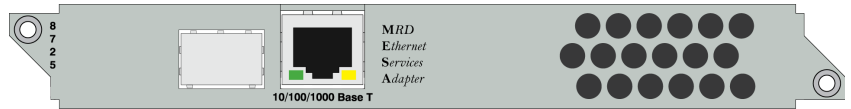
General Description:

This is a factory installed slot that will allow for up to two CAM cards to be installed at a time, giving the MRD 3187B the ability to decrypt Conditional Access transport streams. This card also includes all the functionality of the 8722 option card as well.

8725 – MPEG over IP Input/Output

Configuration Information:

- Maximum of 2 per unit
 - Must be Configuration 2
 - Must have additional fan
- Slot 1-3 and 1-4, or 2-3 and 2-4
- A or B Chassis



General Description:

This card is a dual purpose card in that it can receive and/or transmit from the internal TS bus, MPEG over IP. Up to two multicasts can be subscribed to, allowing for a backup multicast to be chosen and three mirrored multicasts can be transmitted to allow for redundancy.

8727 – Dual MPEG over IP Input / UDP Output

Configuration Information:

- Requires 7.2.0 +
- Slot 1-2, 1-3, 1-4, 2-2, 2-3, and/or 2-4
- B Chassis Only



General Description:

This card is a dual purpose card in that it can receive and/or transmit from the internal TS bus, MPEG over IP. It has two physical connectors that can be configured independently. Up to two multicasts can be subscribed to, allowing for a backup multicast to be chosen and two UDP mirrored unicasts can be transmitted to allow for redundancy.

Decoder Card Overview

8730A – MPEG 2 Decoder (1 Video, 2 Audio)

The MRD 3187B can be configured as a Configuration 1 or as a Configuration 2 as described above. As a Config 1, the MRD 3187B has only one MPEG Decoder. As a Config 2 the MRD 3187B has two MPEG Decoders. The MRD 3187B can be configured, when ordering, to act as two separate RDSs or as one RDS with two decoders to enable four audio processors.

8731A – MPEG 2 Decoder with Genlock (1 Video, 2 Audio)

The MRD 3187B can be configured as a Configuration 1 or as a Configuration 2. As a Config 1, the MRD 3187B has only one MPEG Decoder. As a Config 2 the MRD 3187B has two MPEG Decoders. The MRD 3187B can be configured, when ordering, to act as two separate RDSs or as one RDS with two decoders to enable four audio processors. This decoder also offers the ability to use Genlock.

8732 – MPEG 2/ H.264 Decoder (1 Video, 2 Audio)

The MRD 3187B can be configured as a Configuration 1 or as a Configuration 2 as described above. As a Config 1, the MRD 3187B has only one MPEG Decoder. As a Config 2 the MRD 3187B has two MPEG Decoders. The MRD 3187B can be configured, when ordering, to act as two separate RDSs or as one RDS with two decoders to enable four audio processors.

8733 – MPEG 2 Decoder (1 Video, 4 Audio)

With the 8733 decoder board the MRD 3187B can only be configured as a Configuration 1. Meaning only one MPEG Decoder. The MRD 3187B with the 8733 decoder board can be configured to process four audio streams.

Note: this board requires the 8712 option card.

8734 – MPEG 2/ H.264 Decoder with Genlock (1 Video, 2 Audio)

The MRD 3187B can be configured as a Configuration 1 or as a Configuration 2. As a Config 1, the MRD 3187B has only one MPEG Decoder. As a Config 2 the MRD 3187B has two MPEG Decoders. The MRD 3187B can be configured, when ordering, to act as two separate RDSs or as one RDS with two decoders to enable four audio processors. This decoder also offers the ability to use Genlock.