Cisco D9887B HDTV Modular Receiver Software Version 7.6
Installation and Configuration Guide
Notices

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Please Read This Entire Guide
Veuillez lire entièrement ce guide
Bitte das gesamte Handbuch durchlesen
Sírvase leer completamente la presente guía
Si prega di leggere completamente questa guida

Important
Please read this entire guide before you install or operate this product. Give particular attention to all safety statements.

Important
Veuillez lire entièrement ce guide avant d'installer ou d'utiliser ce produit. Prêtez une attention particulière à toutes les règles de sécurité.

Zu beachten
Bitte lesen Sie vor Aufstellen oder Inbetriebnahme des Gerätes dieses Handbuch in seiner Gesamtheit durch. Achten Sie dabei besonders auf die Sicherheitshinweise.

Importante
Sírvase leer la presente guía antes de instalar o emplear este producto. Preste especial atención a todos los avisos de seguridad.

Importante
Prima di installare o usare questo prodotto si prega di leggere completamente questa guida, facendo particolare attenzione a tutte le dichiarazioni di sicurezza.
Safety Precautions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
Safety Precautions

11 Only use attachments/accessories specified by the manufacturer.

PORTABLE CART WARNING

12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13 Unplug this apparatus during lightning storms or when unused for long periods of time.

14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15 Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.

16 To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

17 The mains plug of the power supply cord shall remain readily operable.

18 Damage Requiring Service: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

   a When the power-supply cord or plug is damaged. If liquid has been spilled, or objects have fallen into the product.

   b If the product has been exposed to rain or water.

   c If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of the controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.

   d If the product has been dropped or damaged in any way.

   e The product exhibits a distinct change in performance.

19 Replacement Parts: When replacement parts are required, be sure the service technician uses replacement parts specified by Cisco, or parts having the same operating characteristics as the original parts. Unauthorized part substitutions made may result in fire, electric shock or other hazards.
20 **Safety Check**: Upon completion of any service or repairs made to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.

21 **Outdoor Antenna Grounding**: If an outside antenna or cable system is connected to this product, ensure that the antenna or cable system is properly grounded to provide protection against voltage surges and built-up static charges. Appropriate sections of the National Electrical Code (NFPA 1990) provide information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

TO CATV SYSTEM INSTALLER
This reminder is provided to call the CATV system installer's attention to Article 820-40 of the National Electrical Code (NEC) that provides guidelines for proper grounding, and in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of entry as practical.
Safety Precautions

Protect yourself from electric shock and your system from damage!

- This product complies with international safety and design standards. Observe all safety procedures that appear throughout this guide, and the safety symbols that are affixed to this product.

- If circumstances impair the safe operation of this product, stop operation and secure this product against further operation.

Avoid personal injury and product damage! Do not proceed beyond any symbol until you fully understand the indicated conditions!

⚠️ You will find this symbol on the product and/or in the literature that accompanies this product.

It indicates important operating or maintenance instructions.

⚠️ You may find this symbol on the product and/or in the literature that accompanies this product.

It indicates a live terminal; the symbol pointing to the terminal device.

⚠️ You may find this symbol on the product and/or in the literature that accompanies this product.

It indicates a protective earth terminal.

⚠️ You may find this symbol on the product and/or in the literature that accompanies this product.

It indicates excessive or dangerous heat.

Power

Important! This is a Class I product. You must earth this product. This product plugs into a socket-outlet. The socket-outlet must be near this product, and must be easily accessible. Connect this product only to the power source that is indicated on the back panel of this product. If this product does not have a mains power switch, the power cord serves this purpose.

Enclosure

Do not allow moisture to enter this product. Do not open the enclosure of this product unless otherwise specified. Do not push objects through openings in the enclosure of this product.

Cables

Always pull on the plug or the connector to disconnect a cable. Never pull on the cable itself. Do not walk on or place stress on cables or plugs.
Safety Precautions

Factory service

Refer service only to service personnel who are authorized by the factory.

Règles de sécurité

Protégez-vous des risques d'électrocution et protégez votre système contre les endommagements éventuels.

- Ce produit respecte les standards internationaux de sécurité et de conception. Veuillez observer toutes les procédures de sécurité qui apparaissent dans ce guide, ainsi que les symboles de sécurité qui figurent sur le produit.

- Si, du fait des circonstances, ce produit cesse de fonctionner normalement, cessez de l'utiliser et empêchez-en l'utilisation future.

Évitez le risque de blessures et de dommages aux produits! Ne procédez à aucune tâche tant que vous n'aurez pas entièrement assimilé les conditions indiquées par un symbole!

⚠️ Ce symbole figure dans la documentation accompagnant ce produit. Il indique d'importantes instructions de fonctionnement ou d'entretien.

⚠️ Ce symbole peut être attaché à ce produit. Il indique une borne sous tension; la direction indique la borne.

-minus Ce symbole peut être attaché à ce produit. Il indique une borne de terre de protection.

⚠️ Ce symbole peut être attaché à ce produit. Il indique une température excessive ou dangereuse.

Alimentation

Important! Ce produit fait partie de la classe I. Vous devez le mettre à la terre. Ce produit se branche dans une prise murale. Cette dernière doit être placée à proximité du produit et doit être facilement accessible.

Ne branchez ce produit qu'à la source d'alimentation indiquée sur son panneau arrière.

Si ce produit n'a pas d'interrupteur d'alimentation générale, le cordon d'alimentation remplit ce rôle.

Enceinte

- Ne laissez pas l'humidité pénétrer dans ce produit.

- N'ouvrez pas l'enceinte de ce produit, sauf instructions contraires.

- Ne forcez pas d'objets dans les ouvertures du boîtier.
Safety Precautions

Câbles
- Tirez toujours sur la prise ou le connecteur pour débrancher un câble, Ne tirez jamais directement sur le câble.
- Ne marchez pas sur les câbles ou les prises et n'y exercez aucune pression.

Réparations effectuées à l'usine
- Ne confiez les travaux de réparations qu'au personnel autorisé par l'usine.

Sicherheitsvorkehrungen

Schützen Sie sich gegen elektrischen Schlag, und Ihr Gerät gegen Beschädigung!
- Sollten örtliche Umstände den sicheren Betrieb dieses Gerätes beeinträchtigen, schalten Sie es ab und sichern es gegen weitere Benutzung.

Vermeiden Sie Verletzungen sowie Beschädigung des Gerätes! Wenn Sie zu einem der folgenden Warnzeichen gelangen, nicht weiterarbeiten, bis Sie seine Bedeutung voll verstanden haben!

⚠️ Dieses Symbol erscheint auf dem Gerät und/oder in der ihm beiliegenden Literatur. Es bedeutet wichtige, zu beachtende Betriebs-oder Wartungsanweisungen.

⚠️ Wenn dieses Zeichen am Gerät angebracht ist, warnt es vor einer spannungsführenden Stelle.

 Đo Dieses Symbol kennzeichnet auf dem Gerät die Anschlußstelle der Sicherheitserde.

⚠️ Wenn dieses Zeichen am Gerät angebracht ist, warnt es vor heißen Stellen, die zu Verbrennungen führen können.

Netzspannung
- Wichtig! Dieses Gerät ist ein Produkt der Schutzklasse I. Es muß geerdet werden.
- Das Gerät ist an einer Steckdose anzuschließen. Diese muß sich leicht zugänglich in unmittelbarer Nähe des Gerätes befinden.
- Die Netzversorgung muß den auf der Rückwand des Gerätes angegebenen Werten entsprechen.
- Falls sich kein Hauptschalter am Gerät befindet, dient das Netzkabel diesem Zweck.
### Gehäuse
- Das Innere des Gerätes ist vor Feuchtigkeit zu schützen.
- Das Gehäuse ist nicht zu öffnen.
- Niemals einen Gegenstand durch die Gehäuseöffnungen einführen!

### Kabel
- Vor jeglicher Wartung des Gerätes sind alle Kabel zu entfernen.
- Hierzu grundsätzlich am Stecker oder Verbindungsstück und niemals am Kabel selber ziehen.
- Nicht auf die Kabel oder Stecker treten oder diese einer Zugbelastung aussetzen.

### Hersteller-Wartung
- Wartungsarbeiten sind nur durch vom Hersteller autorisierte Techniker vorzunehmen.

### Precauciones de seguridad
¡Protéjase contra la electrocución y proteja su sistema contra los daños!
- Este producto cumple con los criterios internacionales de seguridad y diseño. Observe todas los procedimientos de seguridad que aparecen en esta guía, y los símbolos de seguridad adheridos a este producto.
- Si las circunstancias impiden la operación segura de este producto, suspenda la operación y asegure este producto para que no siga funcionando.

¡Evite lastimarse y evite dañar el producto! No avance más allá de cualquier símbolo hasta comprender completamente las condiciones indicadas!

<table>
<thead>
<tr>
<th>Encontrará este símbolo</th>
<th>en el impreso que acompaña a este producto. Este símbolo indica instrucciones importantes de funcionamiento o mantenimiento.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Es posible que este símbolo esté pegado al producto. Este símbolo indica un terminal vivo, la flecha apunta hacia el aparato terminal.</td>
<td></td>
</tr>
<tr>
<td>Podría encontrar este símbolo pegado al producto. Este símbolo indica un terminal de protección de tierra.</td>
<td></td>
</tr>
<tr>
<td>Podría encontrar este símbolo pegado al producto. Este símbolo indica calor excesivo o peligroso.</td>
<td></td>
</tr>
</tbody>
</table>

### Alimentación
- Importante! Este es un producto de Clase I. Tiene que estar conectado a tierra.
- Este producto se conecta a un enchufe. El enchufe necesita estar cerca del producto y ser fácilmente accesible.
Safety Precautions

- Conecte este producto únicamente a la fuente de suministro eléctrico indicada en el panel posterior del producto.
- Si el producto no tiene interruptor para la linea principal, utilice el cordón toma de corriente para este propósito.

Cubierta
- No permita que la humedad penetre en este producto.
- No abra la cubierta del producto a menos que se indique lo contrario.
- No introduzca objetos a través de las aberturas de la cubierta del producto.

Cables
- Tire siempre del enchufe o del conector para desconectar un cable. Nunca tire del cable mismo.
- No camine ni aplique presión sobre los cables o enchufes.

Revisión y reparación de fábrica
- Solo personal aprobado por la fábrica puede darle servicio al producto.

Precauzioni di sicurezza

Proteggetevi da scosse elettriche e proteggete il vostro sistema da possibili danni!
- Questo prodotto soddisfa le norme internazionali per la sicurezza ed il design. Seguite tutte le procedure di sicurezza contenute in questa guida e i simboli di sicurezza applicati al prodotto.
- Se circostanze avverse compromettono la sicurezza d'uso di questo prodotto, interrompetene l'uso e assicuratevi che il prodotto non venga più utilizzato.

Evitare infortuni alla persona e danni al prodotto! Non procedere oltre a qualunque simbolo fino a quando non si siano comprese pienamente le condizioni indicate!

⚠️ Questo simbolo, che appare nella letteratura di accompagnamento del prodotto, indica importanti istruzioni d'uso e di manutenzione.

⚠️ Sul prodotto potete vedere questo simbolo che indica un dispositivo terminale sotto tensione; la freccia punta verso il dispositivo.

🌐 Potrete trovare il presente simbolo applicato a questo prodotto. Questo simbolo indica un terminale protettivo di messa a terra.

⚠️ Potrete trovare il presente simbolo attaccato a questo prodotto. Questo simbolo indica un calore eccessivo o pericoloso.

Alimentazione
- Importante! Questo prodotto è di Classe I. Va messo a terra.
Safety Precautions

- Questo prodotto si inserisce in una presa di corrente. La presa di corrente deve essere in prossimità del prodotto, e deve essere facilmente accessibile.

- Collegare questo prodotto solamente alla fonte di alimentazione indicata sul pannello posteriore di questo prodotto.

- Se questo prodotto non è dotato di un interruttore principale, il cavo di alimentazione funge a questo scopo.

**Chiusura**

- Proteggete da umidità questo prodotto.

- Non aprire la chiusura di questo prodotto a meno che non sia specificato diversamente. Non inserire oggetti attraverso le fessure della chiusura.

**Cavi**

- Per scollegare un cavo tirate la spina o il connettore, non tirare mai il cavo stesso.

- Non calpestare o sottoporre a sollecitazioni i cavi o le prese.

**Riparazioni di fabbrica**

- Per le riparazioni contattate solamente personale tecnico autoizzato dalla fabbrica.
Important Notices for Customers in the United Kingdom

Important

This notice is applicable only if this apparatus has a three-pin power plug.

Warning

This apparatus must be earthed.

Mains lead colours

The following is applicable to Class I apparatus supplied with a flexible cord having cores coloured green-and-yellow, brown, and blue.

Important! The wires in this mains lead are coloured in accordance with the following code.

<table>
<thead>
<tr>
<th>Colour</th>
<th>Mains lead wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green and yellow</td>
<td>Earth</td>
</tr>
<tr>
<td>Blue</td>
<td>Neutral</td>
</tr>
<tr>
<td>Brown</td>
<td>Live</td>
</tr>
</tbody>
</table>

Connecting the mains lead

Mains lead wire colours may not correspond with the colour markings of the terminals in your plug.

<table>
<thead>
<tr>
<th>IF wire colour is</th>
<th>Connect it to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Neutral terminal. Note: The Neutral terminal is typically marked N or coloured black.</td>
</tr>
<tr>
<td>Brown</td>
<td>Live terminalNote: The Live terminal is typically marked L or coloured red.</td>
</tr>
<tr>
<td>Green and yellow</td>
<td>Earth terminal. Note: The Earth terminal is typically marked E (or marked with the safety earth symbol ( ), or coloured green and yellow.</td>
</tr>
</tbody>
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About This Manual

Objective

This manual describes how to install, use, and maintain the Cisco® D9887B HDTV Modular Receiver.

Note: The manual describes all available options for the D9887B receiver. Your D9887B receiver may only have some of the features described in this manual.

Audience

The audience includes users (operators) and service personnel who are responsible for the installation, configuration, operation, monitoring, and service of the D9887B receiver.

Required Knowledge

To use this documentation, the user should have a basic knowledge of the technology used in relation to this product. Service personnel should have additional skills and be familiar with cabling, electronic circuitry, and wiring practices.

This manual is intended for operators who are responsible for the configuration, remote operation, and maintenance of the D9887B receiver.
Overview

This chapter provides installation and a quick setup for your D9887B receiver.

In This Chapter

- Installation ................................................................. 2
- Quick Start Guide ......................................................... 5
- Maintenance ................................................................. 6
Installation

Cooling

The D9887B receiver is cooled via forced induction through the front of the unit and exhausted through the vents on either side. The D9887B receiver is equipped with a temperature controlled status indicator. If the temperature inside the unit exceeds 70° C, the red “Error” LED will illuminate and a description of the error will appear in the “Error List.”

Rack Information

The D9887B receiver is intended to be mounted in a standard 19" rack. It occupies 1U of rack space and the connections are all on the rear of the unit.

Rack Installation

To install the D9887B receiver into a rack, use the following steps:

1. Determine the desired position in the rack for the D9887B receiver, making sure that the air intake on the front of the unit and the exhausts on the sides of the unit will not be obstructed.
2. Insert the rack mount clips into place over the mounting holes in the rack.
3. Slide the D9887B receiver into position in the rack.
4 Secure the D9887B receiver to the rack by installing the four supplied screws through the front mounting holes and tightening.

Power Connection

Using the proper power connections is vital to the safe operation of the D9887B receiver. Only use the supplied 3-prong power connector or one with equal specifications.

**WARNING:**

NEVER tamper with or remove the third prong grounding pin. This could cause damage to the D9887B receiver, personnel, or property.

AC Power Connection

The D9887B receiver is intended for use on either 120V or 240V systems. The power supply will automatically detect the system it is connected to. To hook up the power, use the following steps:

1. Locate the AC power cord included with the D9887B receiver.
2. Plug the female end of the power cord (end with no prongs) into the back of the unit.
3. Locate a protected outlet (usually inside of the rack) to plug the male end of the power cable into.

DC Power Connection (if equipped)

Using the proper power connections is vital to the safe operation of the D9887B receiver. The D9887B receiver is intended for use in 40-65 VDC systems. The power supply will automatically detect the system it is connected to. **When installing the D9887B receiver, the power supply MUST be used in conjunction with an overcurrent protective device rated at 50 V, 5 A, type: Slow-blo, as part of battery-supply circuit.**
Chapter 1  Getting Started

![WARNING:](Image)
Failure to include an over-current protective device could cause damage to the D9887B receiver, personnel, or property.
Quick Start Guide

To get the D9887B receiver up and running there is a few things that need to be done.

1. Select the desired input as active.
2. Setup the decoder with the proper PIDs.
3. Setup the desired output(s).

The easiest way to set these options up is to refer to *Using the Front Panel to Configure the D9887B HDTV Modular Receiver* (on page 23).
**Maintenance**

The D9887B receiver is virtually a maintenance-free piece of equipment. There are no user serviceable parts on the inside of the unit, however it is recommended that the user cleans the intake filter on the front right side of the unit on a regular basis to ensure an unobstructed cool air intake. To remove the filter, open the door on the front side of the unit and remove.
Controls and Configuration

Overview
This chapter describes the controls in the D9887B HDTV Modular Receiver. It describes the most common applications and interfaces of the receiver.

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- Error Logic .................................................................................................................. 11
- SNMP Traps ............................................................................................................... 13
- Input/Output Slot Organization .................................................................................. 14
Chapter 2  Controls and Configuration

D9887B Receiver

Front of Unit

Rear of Unit
The following figure shows a typical screen on the front panel. Several important features have been circled and noted below. These features are common to all screens and assist when navigating, viewing, and editing unit information. The Home button will return the user to the home level while in any screen. To edit a selected parameter, press the **Enter** button. Once a parameter has been changed, press the **Enter** button again in order for the change to take effect on the unit. Press the **Exit** button to leave the edit mode without changes taking effect.

1. Icons indicate which control buttons are currently valid for entry.
2. Screen title.
3. Cursor shows which line is active.
4. When editing, active character or item is highlighted.

### Front Panel Indicators

The D9887B receiver has four internal error parameters: INPUT, DECODER, FAN, and TEMPERATURE. These parameters can be monitored locally or remotely. Locally, the unit’s status can be checked by visually looking at the INPUT LED and the ERROR LED on the front panel, then use the "Error List" under the **Menu** button to pinpoint the error. Remotely, the unit’s status can be checked by using the web client and looking at the status icons on the top of the main window. To see a detailed list of errors, click on the **Unit** tab from the web client.
Chapter 2  Controls and Configuration

The INPUT LED indicates the presence of a stream at the user-selected input. “Stream present” is represented by a green INPUT LED while “stream NOT present” is represented by a dark INPUT LED.

The ERROR LED represents the combined status of the unit’s error indicators. If INPUT, DECODER, TEMP, or FAN status is in the error state, the LED will be red. If all error indicators are good, the LED will be dark.
Error Logic

Input Error Logic

The input status is based on the selected input card’s status and the transport error indicator bit in the transport stream being decoded. For example, if the current input is VSB, the input status is based on: VSB receiver lock, RF channel level, and the MER level. The RF channel and MER thresholds can be set by the user. If the unit detects the presence of the transport error bit in a transport packet header, the input status will be an error for 0.5 seconds each time the TS error bit is set. The system must detect a constant cadence of sync bytes (0x47h) every 188 bytes and detect a valid PAT at least every 500 ms in order for the INPUT LED to illuminate.

Decoder Error Logic

The decoder error indicator is based on the decoder’s ability to decode what the user has requested. The input status will be alarmed differently depending on the current decoding mode:

- In "Auto Mode," the decoder status will be good unless the Video or Audio decoders cannot decode a stream. For example: a stream defines program 4 to have video on PID 52. If PID 52 is not actually present in the stream, or is undecodable, the decoder status will be in the error state. This is true for all modes.

- In "PID Lock Mode," the decoder status will be good if all of the PIDs entered by the user, for video and audio, are being decoded by the unit. If the user wants nothing to be decoded, the PID should be set to 0. If the user enters a PID which is not present or cannot be decoded, the decoder status will be in the error state.

- In "Program Priority Mode," the decoder status will be good if any priority is currently active and the Audio and Video represented by that priority are being decoded. If the PMT for a selected program lists a video or audio PID, but the decoder cannot decode that PID, the indicator will be in the error state. If the user enters an index for a priority that does not exist in the PMT, the indicator will still be good because the decoder will be set to decode nothing on that audio output.

Temperature Error Logic

The temperature error indicator is based on the correct operation of the unit. If the unit’s internal temperature exceeds 70 °C, the temperature status will be in the error state.
Chapter 2  Controls and Configuration

Fan Error Logic

If the fan in the unit fails, the fan status will be in the error state. The fan status will be good as long as the fan is spinning at the proper RPM.
SNMP Traps

The unit contains separate SNMP Traps for Fan Status, Temperature Status, Decoder Status, Input Status, and IP Receive Group. Whenever any item changes state, a trap is sent to the configured host.
Input/Output Slot Organization

The D9887B receiver’s modular design allows many different input/output configurations. An indexing system is used to identify module slots for configuration and monitoring reference. The bottom row of slots is numbered 1-1 through 1-4 (left to right). The top row is numbered 2-1 through 2-4 as shown.
Overview

This chapter includes a brief overview of the different option cards that are available for the D9887B receiver. There are descriptions of each card as well as pictures of the various inputs and outputs for each card.

In This Chapter

- Overview of the Option Cards

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Overview of the Option Cards

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<td>8VSB/QAM Receiver Option</td>
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<tr>
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<td>Serial Transport Stream I/O (DVB-ASI/SMPTE 310M) Option</td>
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<td><img src="image" alt="High Bit Rate ASI Input Option" /></td>
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<td>Video Output (1 RGBHV/YPbPr, 1 Composite) Option</td>
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<tr>
<td><img src="image" alt="Audio Output (Dolby® E, AES Digital, Analog) Option" /></td>
<td>Audio Output (Dolby® E, AES Digital, Analog) Option</td>
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<tr>
<td><img src="image" alt="Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Composite) Option" /></td>
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<td><img src="image" alt="GPIO Module Option" /></td>
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<tr>
<td><img src="image" alt="Dual Input COFDM Receiver Option" /></td>
<td>Dual Input COFDM Receiver Option</td>
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<th>Description</th>
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<tr>
<td>Dual MPEG over IP Input/UDP Output Option</td>
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<tr>
<td>PID Filtering Dual Output MPEG over IP UDP Output Option</td>
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</tbody>
</table>

VSB/QAM Receiver Option

This card will receive a TS that is demodulated from an 8 VSB signal or it will demodulate a QAM 64B or QAM 256B RF input. With an 8 VSB 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 D9887B receiver 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.

Serial Transport Stream I/O (DVB-ASI/SMPTE 310M) Option

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 1.5 Mb/s and 160 Mb/s. For a SMPTE-310M input, the bitrate of the TS must be 19.392658 Mb/s. The selected input format will also be the output format. It can also be used as a TS output for any of the other input cards.

High Bit Rate ASI Input Option

This card will receive, up to a 160 Mb/s MPTS on the 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.
Chapter 3  Option Cards Overview

Video Output (2 SD-SDI, 1 Composite) Option

A standard definition video output card. It provides two mirrored serial digital (SMPTES-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.

Video Output (2 HD-SDI, 1 RGBHV/YPbPr) Option

A high definition video output card. It provides two mirrored serial digital (SMPTES-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.

Video Output (1 RGBHV/YPbPr, 1 Composite) Option

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.

Audio Output (Dolby E, AES Digital, Analog) Option

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. It also has a Dolby E parsing feature.

Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Composite) Option

A versatile video output card. It provides two user selectable serial digital (SMPTES-259M, or SMPTES-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.
Overview of the Option Cards

**Dual Input DVB-S/DVB-S2 Receiver Option**

This card will input a satellite L-band (950 MHz – 2150 MHz) signal for demodulation of KU-band or C-band DVB-S QPSK signals or DVB-S2 QPSK/8PSK signals. The symbol rate ranges from 1 MSym/s to 45 MSym/s for DVB-S and 1-30 MSym/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.

**Dual Input ASM Receiver Option**

This card will input a satellite L-band (950 MHz – 2150 MHz) 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 0.256 MSym/s to 30 MSym/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.

**Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp) Option**

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 MPEG Decoder with Genlock (1 Video, 4 Audio) board.

**GPIO Module Option**

This module is considered a global unit option. 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.
Chapter 3  Option Cards Overview

Dual Input COFDM Receiver Option
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.

Quad Input DVB-S/DVB-S2 with LNB Option
This card will input a satellite L-band (950 MHz – 2150 MHz) signal for demodulation of KU-band or C-band DVB-S QPSK signals or DVB-S2 QPSK/8PSK signals. The symbol rate ranges from 1 MSym/s to 45 MSym/s for both DVB-S and DVB-S2. This card provides LNB power and 22 kHz control tone to the active input. This card has advanced feature options of multistream input, support for VCM, and support for 16APSK and 32APSK modulation. 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, B, C and D inputs, which may be independently configured, but only one may be active at a time.

CAM Decryption Option
This is a factory installed slot that will allow for up to two CAM cards to be installed at a time, providing the D9887B receiver the ability to decrypt Conditional Access transport streams.

Backup Network Controller Option
This is a factory installed option into slot 1-4, giving the user the ability to control the D9887B receiver through a secondary network controller card.

MPEG over IP Input/Output Option
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.

Dual MPEG over IP Input/UDP Output Option
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.
Overview of the Option Cards

**Example Configurations**

"Leave" IGMP V2 & V3 Multicast/Unicast
- Filter Mode: Include
- IP list: empty

"Join" IGMP V2 & V3 Multicast/Unicast
- Filter Mode: Exclude
- IP list: empty

"Join Filtered" IGMP V3 Multicast/Unicast
- Filter Mode: Include
  - IP: X.X.X.X Or
  - Filter Mode: Exclude
  - IP: X.X.X.X

**IP Address Selection**

**Unicast:** X.X.X.X – 223.255.255.255

**Multicast:** 224.X.X.X – 239.255.255.255

**Suggested Multicast Range:** 239.192.X.X

**Suggested Port Selection**
- Choose a port number of 5000 or more
- Choose even numbered ports
- If using FEC the following example applies
  - Destination port = 5000
  - Column FEC = 5002
  - Row REC = 5004
  - Next available multicast port = 5006

**PID Filtering Dual Output MPEG over IP UDP Output Option**

The PID Filtering Dual Output MPEG over IP UDP Output option has the ability to "remultiplex" the active input TS into a transport stream with reduced services and/or a lower bitrate before transmission onto the network.

This option is a single slot output only card that supports PID filtering and automatic table modification. This output option will use two Ethernet connections independently to transmit MPEG-2 transport streams over IP networks from a valid input source (ASI, DVB-S2, IP input, etc.) A multi program transport stream (MPTS) input can be reduced into as many as 5 output transport streams. Any combination of services present in the source stream may be selected for the output transport stream. Each output IP stream can then be routed to one of two Ethernet ports as desired. This option can also adapt the transport stream bitrate and recalculate the PCR values in the output transport streams to be correct for the new multiplex.

**IP Address Selection**

**Unicast:** X.X.X.X – 223.255.255.255

**Multicast:** 224.X.X.X – 239.255.255.255

**Suggested Multicast Range:** 239.192.X.X
4

Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Overview

This chapter describes how to navigate through the configuration menus on the front panel of the D9887B receiver.

Note: All instructions in this manual are based on the unit software version 7.3.X. Newer versions of software, when released, may operate slightly different in regards to menus and configuration.
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Input Option – Active Input and Backup Configuration Selection

General Information

The selection of the Active input and configuration of the Backup input are described in this section.

Supported Option Cards

8VSB/QAM Receiver option, Serial Transport Stream I/O (DVB-ASI/SMPTE-310M) option, High Bit Rate ASI Input option, Dual Input DVB-S/DVB S2 Receiver option, Dual Input ASM Receiver option, Dual Input COFDM Receiver option, Quad Input DVB-S/DVB-S2 with LNB option, MPEG over IP Input/Output option, and Dual MPEG over IP Input/UDP Output option.

Description

The Active input specifies the card that is being used as the input option. The Backup configuration enables/disables the switching to a backup input, defines the Primary Input and Backup Input, when to restore to the Primary Input and a timeout before switching to the Backup Input, or restoring to the Primary Input.

Changing the Active Input

To set an Active Input, use the following steps:

1. Press the Input button.

Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2. Press the Enter button to edit the Active Input. The current Active Input is displayed along with a "(P)" for Primary or "(B)" for Backup if the Backup Mode in enabled.

Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.
3 Press the **Enter** button again to edit the Active Input.

4 Press the **Enter** button again to use the **Up** and **Down** buttons to change the Active Input selection, then press the **Enter** button to save the selection.

*Note:* When Backup Mode is enabled, only the Primary or Backup input option can be made the active input. If Backup Mode is disabled, any installed input option can be made the active input.

## Configuring Input Backup Settings

1 Press the **Input** button.

2 Use the **Up** and **Down** buttons to move the cursor to "Backup Mode," then press the **Enter** button.

3 Press the **Enter** button again to edit the Backup settings.

### Setting the Backup Mode

1 Use the **Up** and **Down** buttons to move the cursor to "Backup," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select "Enabled" or Disabled," and then press the **Enter** button to save the selection.

### Setting the Primary Input

1 Use the **Up** and **Down** buttons to move the cursor to the input shown as the Primary Input, then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select the input option to use as the Primary, and then press the **Enter** button to save the selection.
Setting the Backup Input
1. Use the Up and Down buttons to move the cursor to the input shown as the Backup Input, then press the Enter button.

2. Use the Up and Down buttons to select the input option to use as the Backup, and then press the Enter button to save the selection.

Setting the Primary Restore Setting
1. Use the Up and Down buttons to move the cursor to the "Primary Restore" setting, then press the Enter button.

2. Use the Up and Down buttons to select "Never", "When Primary Rtns", or "On Backup Failure", and then press the Enter button to save the selection.

Setting the Backup Timeout Setting
1. Use the Up and Down buttons to move the cursor to the "Switchover" setting, then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the value of the timeout (3 – 45 seconds), then press the Enter button to save the selection.
8VSB/QAM Receiver Option

General Information

Install Location: Any slot except 1-1 and 2-1.

I/O: (1) 75 ohm Female F Connector

Supported Formats: 8VSB, QAM-64B, QAM-256B

Description: This card provides demodulation of 8 VSB or QAM. For 8 VSB, the card is able to tune to channels 2 - 69 on UHF/VHF and channels 2 - 134 on the cable channel bands of FCC cable, IRC, and HRC. For QAM, the card is able to receive both QAM-64B and QAM-256B and is able to tune to channels 2 - 134 in the cable bands of FCC cable, IRC, and HRC.

To Edit the Option Card Input Settings

To edit this input card, use the following steps:

1. Press the Input button.
   
   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2. Use the Up and Down buttons to select "Input Modules," and press the Enter button.

3. Use the Up and Down buttons to move the cursor to the "VSB/QAM" card of the specific slot (e.g. 1-4). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

4. Press the Enter button once to display the Status screen for the VSB/QAM card.

5. Press the Enter button again to display the Edit screen for the VSB/QAM card.
Channel

1 Use the Up and Down buttons to move the cursor to "Chan," then press the Enter button.

2 Use the Up and Down buttons to tune to the specific RF channel of interest, then press the Enter button to save the selection.

Note: The Channel selection is (2 – 69) for "Air/CATV," set to "OffAir," and (2 – 134) for the other "Air/CATV" settings.

Modulation

1 Use the Up and Down buttons to move the cursor to "Modulation," then press the Enter button.

2 Use the Up and Down buttons to choose the appropriate modulation type ("8VSB", "QAM64B", "QAM256B"), then press the Enter button to save the selection.

Channel Bands

1 Use the Up and Down buttons to move the cursor to "Air/CATV," then press the Enter button.

2 Use the Up and Down buttons to choose the appropriate channel band ("OffAir", "Cable-FCC", "Cable-HRC", "Cable-IRC"), then press the Enter button to save the selection.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Set Low Signal and MER Error Levels

These two values are user-defined threshold levels for the signal level and MER level. Once these values are set, if the input levels drops below the defined value, an error will be triggered which will cause the red "Error" LED to illuminate on the front panel. A description of the error will be shown in the "Active Errors" menu under the Menu button, and an entry will be logged in the event log.

1  Use the Up and Down buttons to move the cursor to "Low," then press the Enter button.

2  Use the Left and Down buttons to select the column to edit and use the Up and Down buttons to set the value of the low signal alarm threshold (-30 dBmV - +40 dBmV), then press the Enter button to save the selection.

3  Use the Up and Down buttons to move the cursor to "MER," then press the Enter button.

4  Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the value of the low MER alarm threshold (0 dB - 40 dB), then press the Enter button to save the selection.

Reset FEC Error Counters

The D9887B receiver counts the FEC errors on the input. These counters can be reset to "0" so that monitoring of the counts can beginning from a known reference point.

1  Use the Up and Down buttons to move the cursor to "Reset Counters," then press the Enter button.

2  Press the Enter button again to reset the FEC error counters.
Serial Transport Stream Input/Output (DVB-ASI/SMPTE 310M) Option

**General Information**

**Install Location:** Any slot except 1-1 and 2-1.

**I/O:** (1) 75Ω Female BNC Input, (1) 75Ω Female BNC Output

**Supported Formats:** DVB-ASI, 310M

**Description:** This card provides either DVB-ASI or 310M input and output. The card will provide 310M output only if the input TS is 19.39 Mb/sec. When the card is in ASI mode, the TS bitrate for both the input and output is from 1.5 Mb/sec - 160 Mb/sec. When the card is in SMPTE-310M mode, the bitrate for both input and output must be 19.39 Mb/sec. The output jack on this card is an active loop-through (i.e. a re-serialized TS). The output will be the same type that the input is set for (e.g. 310M or ASI). The card can be used to provide an ASI TS output from another type of input on the unit (e.g. 8VSB).

**To Edit the Input Option**

To edit this input card, use the following steps:

1. Press the **Input** button.
   
   **Note:** For Configuration 2 units, select RDS1 or RDS2, then press **Enter**.

2. Select "Input Modules," and press the **Enter** button.

3. Use the **Up** and **Down** buttons to move the cursor to the "ASI/310M" card of the specific slot (e.g. 2-3). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

4. Press the **Enter** button once to display the Status screen for the ASI/310M card.

5. Press the **Enter** button again to display the Edit screen for the ASI/310M card.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Input Type

1. Use the Up and Down buttons to move the cursor to "Type," then press the Enter button.

```
ités ASI/310M 2-3
►Type:ASI
```

2. Use the Up and Down buttons to select the appropriate input ("ASI", "310M"), then press the Enter button to save the selection.
High Bit Rate ASI Input Option

General Information

Install Location: Any slot except 1-1 and 2-1.

I/O: (1) 75Ω Female BNC Input, (1) 75Ω Female BNC Loop Out

Supported Formats: ASI

Description: This card provides DVB-ASI input for MPTS up to 160 Mb/sec. The maximum TS bitrate for the card is 160 Mb/sec if the stream consists of a MPTS where no program within the stream is greater than 54 Mb/sec. The output on the card is a passive loop-through and should be terminated with a 75 ohm terminator when not in use. The card cannot be used to provide a TS output from another TS input on the unit.

To Display the High Bit Rate ASI Status

Note: There are no user settings associated with this card.

1 Press the Input button.  
   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2 Select "Input Modules," and press the Enter button.

```
↓↑ Input       j [ ] [ ] [ ]
|ASI+ 2-2
|VSB/QAM 1-4
|ASI/310M 2-3
```

3 Use the Up and Down buttons to move the cursor to the "ASI+" card of the specific slot (e.g. 2-2). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

4 Press the Enter button once to display the Status screen for the ASI+ card.
Video Output (2 SD-SDI, 1 Composite) Option

General Information

**Install Location:** 1-1 or (2-1, only on Configuration 2 units or Configuration 1 with dual decoders)

**I/O:** (2) 75Ω Female BNC SD-SDI outputs, (1) 75Ω Female BNC NTSC/PAL Composite output

**Supported Formats:** SD-SDI, NTSC/PAL Composite

**Description:** This card provides three mirrored outputs from any of the available input option cards. Two of the outputs are SD-SDI and one is NTSC Composite. This card provides Composite Color Phase Reference when used with Genlock and the Genlock decoder.

Output Control

1. Press the **Output** button.
   
   **Note:** For Configuration 2 units, select RDS1 or RDS2, then press the **Enter** button.

2. Use the Up and Down buttons to move the cursor to the "SD Video" card of the specific slot (e.g. 1-1). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

Video Settings

1. Use the Up and Down buttons to move the cursor to "Video," then press the **Enter** button to display the Video Status screen for the video output card.

2. Press the **Enter** button again to display the Edit screen for the video output card.
Select Format Setting

When in "Auto" mode, the unit will automatically pick the format which is closest to the native format of the decoded video in the elementary stream. When in "Manual" mode, the format may be selected from the list of available output formats listed under "Video Format" below.

1. Use the Up and Down buttons to move the cursor to "Select Format," then press the Enter button.

2. Use the Up and Down buttons to select either "Auto" or "Manual" mode, then press the Enter button to save the selection.

Video Format

1. Use the Up and Down buttons to move the cursor to "Format," then press the Enter button.

2. Use the Up and Down buttons to select the appropriate format, then press the Enter button to save the selection.

<table>
<thead>
<tr>
<th>Format</th>
<th>Mode</th>
<th>Frame Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>720x480i</td>
<td>4x3</td>
<td>29.97</td>
</tr>
<tr>
<td>720x480i</td>
<td>16x9</td>
<td>29.97</td>
</tr>
<tr>
<td>720x576i</td>
<td>16x9</td>
<td>25.00</td>
</tr>
<tr>
<td>720x576i</td>
<td>4x3</td>
<td>25.00</td>
</tr>
</tbody>
</table>

NTSC Pedestal

When the "NTSC Ped" is enabled, it applies a 7.5IRE pedestal to the black level of the Composite video output.

1. Use the Up and Down buttons to move the cursor to "NTSC Ped," then press the Enter button.
Chapter 4 Using the Front Panel to Configure the D9887B HDTV Modular Receiver

2 Use the Up and Down buttons to enable or disable the pedestal, then press the Enter button to save the selection.

Display Mode
1 Use the Up and Down buttons to move the cursor to "Disp Mode," then press the Enter button.

2 Use the Up and Down buttons to select the appropriate display mode ("Letterbox", "Cropped", "Anamorph"), then press the Enter button to save the selection.

SDI Video Loss Mode
1 Use the Up and Down buttons to move the cursor to "SDI Video Loss Mode," then press the Enter button.

2 Use the Up and Down buttons to choose between "Display Raster" or "Disable Output," then press the Enter button to save the selection.

Auto AFD
1 Use the Up and Down buttons to move the cursor to "Auto AFD," then press the Enter button.

2 Use the Up and Down buttons to select the appropriate mode ("Enabled" or "Disabled"), then press the Enter button to save the selection.
**Video Shift**

Video Shift provides a horizontal and vertical shift of the video output.

1. Use the **Up** and **Down** buttons to move the cursor to "H-shift," then press the **Enter** button.

```
<table>
<thead>
<tr>
<th>SD Video 1-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto AFD:Disabled</td>
</tr>
<tr>
<td>H-Shift:+00 steps</td>
</tr>
<tr>
<td>V-Shift:+00 steps</td>
</tr>
</tbody>
</table>
```

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the horizontal step (-50 - +50 steps, where the minus direction moves the video down), then press the **Enter** button to save the selection.

3. Use the **Up** and **Down** buttons to move the cursor to "V-shift," then press the **Enter** button.

```
<table>
<thead>
<tr>
<th>SD Video 1-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto AFD:Disabled</td>
</tr>
<tr>
<td>H-Shift:+00 steps</td>
</tr>
<tr>
<td>V-Shift:+00 steps</td>
</tr>
</tbody>
</table>
```

4. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the vertical step (-50 - +50 steps, where the minus direction moves the video to the left), then press the **Enter** button to save the selection.

**Raster Color**

This setting determines the color of the raster that is output by the decoder when input is lost.

1. Use the **Up** and **Down** buttons to move the cursor to "Raster Color," then press the **Enter** button.

```
<table>
<thead>
<tr>
<th>SD Video 1-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-Shift:+00 steps</td>
</tr>
<tr>
<td>V-Shift:+00 steps</td>
</tr>
<tr>
<td>Raster Color: Black</td>
</tr>
</tbody>
</table>
```

2. Use the **Up** and **Down** buttons to select the desired raster color ("Black", "White", "Yellow", "Cyan", "Green", "Magenta", "Red", "Blue"), then press the **Enter** button to save the selection.
Genlock Offset

The Video Output (2SD-SDI, 1 Composite) option card can be Genlocked to a standard "black and burst" signal applied to the Genlock input on the back panel. The frame rate of the "black and burst" signal must be the same as the frame rate of the video output. The "Genlock Reference," under the Menu button, must be set to the type of Genlock signal being used as well. If the Genlock input source is lost, the red "Error" LED will illuminate on the front panel, a description of the error will be shown in the "Active Errors" menu under the Menu button, and an entry will be logged in the event log. The video will restore but will not be Genlocked until the Genlock signal is restored.

When the "Genlock Reference" is set to an SD source of NTSC or PAL, the "Genlock Offset" includes a "Color Ref" setting.

Use the Up and Down buttons to move the cursor to "Genlock Offset," then press the Enter button.

1 Use the Up and Down buttons to move the cursor to "Vert," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the number of lines, then press the Enter button to save the selection.

Note: The maximum amount of offset is determined by the format of the video set.

Horizontal

1 Use the Up and Down buttons to move the cursor to "Horiz," then press the Enter button.
2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the number of pixels, then press the **Enter** button to save the selection.

**Note:** The maximum amount of offset is determined by the format of the video set.

**Color Reference**

**Note:** The Color Reference is only available when the Genlock reference is SD.

1 Use the **Up** and **Down** buttons to move the cursor to "Color ref," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the number of degrees (-180 – +180), then press the **Enter** button to save the selection.

**SDI VANC Assignment**

To edit the SDI VANC Assignment, use the following steps.

1 Use the **Up** and **Down** buttons to move the cursor to "SDI VANC Assign," then press the **Enter** button to display the status screen for the VANC.

2 Press the **Enter** button once more to enter the Edit screen.

**Ancillary Data Packets**

This controls the embedding of the Ancillary Data Packets (ADP) into the VANC of the SDI output.

1 Use the **Up** and **Down** buttons to move the cursor to the desired type of Ancillary Data Packet ("EIA-608CC", "EIA-708CC", "TTX S2031M", "Source ID", or "SCTE 127", "AFD"), then press the **Enter** button.
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2  Use the Up and Down buttons to choose "Enabled" or "Disabled," then press the Enter button to save the selection.

3  Use the Up and Down buttons to select "Line" for the ADP and press the Enter button.

4  Use the Up and Down buttons to change the line number (4 – 15) in which the ancillary data will be located, then press the Enter button.

Note: Repeat steps 1-4 above to change EIA-708CC, TTX S2031M, Source ID, SCTE 127 and AFD.

NTSC Waveforms
To enable NTSC items, use the following steps:

1  Use the Up and Down buttons to move the cursor to "Line 21CC," then press the Enter button.

2  Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

Note: Repeat steps 1-2 above to change AMOL and TVG2x.

PAL Waveforms
To enable PAL items, use the following steps:

1  Use the Up and Down buttons to move the cursor to "TTX," then press the Enter button.

2  Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

Note: Repeat steps 1-2 above to change VPS and WSS.
Composite VBI Assignment

To edit the Composite VBI Assignment, use the following steps.

1. Use the Up and Down buttons to move the cursor to "Cmpst VBI Assignment," then press the Enter button to display the status screen for the VBI.

2. Press the Enter button once more to enter the Edit screen.

NTSC Waveforms

To enable NTSC items, use the following steps.

1. Use the Up and Down buttons to move the cursor to "Line21 CC," then press the Enter button.

2. Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

   Note: Repeat steps 1-2 above to change AMOL, and TVG2x.

PAL Waveforms

To enable PAL items, use the following steps:

1. Use the Up and Down buttons to move the cursor to "TTX," then press the Enter button.

2. Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

   Note: Repeat steps 1-2 above to change VPS, and WSS.
Overlay Settings

Overlays provide an easy way to help troubleshoot problems, monitor stream characteristics, or decode closed captioning.

**CAUTION:** All overlays will appear on the downstream video.

Use the **Up** and **Down** buttons to move the cursor to "Overlay," then press the **Enter** button.

1. **Type of Overlay**
   1. Use the **Up** and **Down** buttons to move the cursor to "Type," then press the **Enter** button.
   2. Use the **Up** and **Down** buttons to select which overlay to display ("Off", "Closed Caption", "Service", "Table", "Subtitle"), then press the **Enter** button to save the selection.

   **Note:** The "1" in "Overlay 1" refers to the RDS.

**Overlay (Closed Caption)**

Note: This menu changes depending on which overlay is set in "Type of Overlay" above.

1. Use the **Up** and **Down** buttons to move the cursor to "Overlay," then press the **Enter** button.
2. Use the **Up** and **Down** buttons to select the appropriate type of overlay ("NTSC" or "DTVCC"), then press the **Enter** button to save the selection.
Video Output (2 SD-SDI, 1 Composite) Option

NTSC Closed Captions

Note: This option will only be available if the TYPE of overlay is set to "Closed Caption" and the "Overlay" is set to "NTSC."

1 Use the Up and Down buttons to move the cursor to "NTSC Srvc," then press the Enter button.

2 Use the Up and Down buttons to select the desired number of closed caption to view (1-4), then press the Enter button to save the selection.

DTVCC Closed Captions

Note: This option will only be available if the TYPE of overlay is set to "Closed Caption" and the "Overlay" is set to "DTVCC."

1 Use the Up and Down buttons to move the cursor to "DTVCC Srvc," then press the Enter button.

2 Use the Up and Down buttons to select the desired number of closed caption to view (1-7), then press the Enter button to save the selection.

Overlay (Table)

Note: This menu changes depending on which overlay is set in "Overlay."

1 Use the Up and Down buttons to move the cursor to "Overlay," then press the Enter button.

2 Use the Up and Down buttons to select the appropriate type of overlay ("PSI PAT", "PSI PMT", "ATSC MGT", "ATSC STT", "ATSC TVCT", "ATSC EIT", "ATSC EPG"), then press the Enter button to save the selection.
Screen Interaction

This mode allows the user to page through the on-screen PSI/ATSC tables.

**Note:** This option is only available if the type of overlay is set to "Table."

1. Use the Up and Down buttons to move the cursor to "Screen Interaction," then press the Enter button.

2. While this mode is enabled, the Up, Down, Left, and Right buttons will control the on-screen PSI/ATSC tables. To exit the "Screen Interaction" mode, press the Exit button.

Coordinated Universal Time Offset

1. Use the Up and Down buttons to move the cursor to "Utc Offset," then press the Enter button.

2. Use the Up and Down buttons to change to the appropriate offset, then press the Enter button to save the selection.

**Note:** The UTC values and their offsets are listed in Appendix D - Coordinated Universal Time (on page 307).

Overlay (Service)

**Note:** This option only displays the Service Info.

Overlay (Subtitle)

This overlays the DVB Subtitles. The subtitle is selected by choosing the language to display. Only the available languages that are present can be selected. When an input without DVB Subtitles is used, no language can be selected.

**Note:** This menu changes depending on which overlay is set in "Overlay."
Video Output (2 SD-SDI, 1 Composite) Option

1 Use the **Up** and **Down** buttons to move the cursor to "Lang," then press the **Enter** button.

```
下行 Overlay 1
Type:Subtitle
Lang:------
```

2 Use the **Up** and **Down** buttons to select the language from those that are present, then press the **Enter** button to save the selection.

**Small Format Display**

To setup the D9887B receiver to output a "Small Format Display," use the following steps:

1 Use the **Up** and **Down** buttons to move the cursor to "Small Format Disp," then press the **Enter** button.

```
下行 SD Video 1-1
SDI VANC Assignment
Overlay
Small Format Disp
```

2 Press the **Enter** button again to change the settings.

**Format**

This output format is used whenever a small format (less than 720x480 or 720x567) is received. The small format video is placed in the output format specified here in the position defined by the "SFD Location" setting.

1 While the cursor is on "Output Format," press the **Enter** button to change the display format.

```
下行 SFD 1-1
Format:720x480i
4x3 29.97
SFD Location:Top-LT
```

2 Use the **Up** and **Down** buttons to change from any of the format settings.

3 Press the **Enter** button to save the settings.

<table>
<thead>
<tr>
<th>Format</th>
<th>Aspect</th>
<th>Frame Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>720x480i</td>
<td>4x3</td>
<td>29.97</td>
</tr>
<tr>
<td>720x480i</td>
<td>16x9</td>
<td>29.97</td>
</tr>
<tr>
<td>720x576i</td>
<td>16x9</td>
<td>25.00</td>
</tr>
<tr>
<td>720x576i</td>
<td>4x3</td>
<td>25.00</td>
</tr>
</tbody>
</table>
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

SFD Location

1 Use the Up and Down button to move the cursor to "SFD Location," and then press the Enter button.

2 Use the Up and Down buttons to select one "Top-Lt", "Mid-Lt", "Btm-Lt", "Top-Rt", "Mid-Rt", "Btm-Rt", "Top-Ctr", "Mid-Ctr", "Btm-Ctr", then press the Enter button to save the settings.
Video Output (2 HD-SDI, 1 RGBHV/YPbPr) Option

General Information

Install Location: 1-1 or (2-1, only on Configuration 2 units or Configuration 1 with dual decoders)

I/O: (2) 75Ω HD-SDI Female BNC outputs, (1) 15-pin D-sub Female analog output

Supported Formats: HD-SDI, YPbPr, RGBHV

Description: This card provides three mirrored outputs from any of the available input option cards. Two of the outputs are HD-SDI and one is analog YPbPr/RGBHV.

Output Control

1. Press the Output button.
   
   Note: For Configuration 2 units, select RDS1 or RDS2, then press the Enter button.

2. Use the Up and Down buttons to move the cursor to the "HD Video" card of the specific slot (e.g. 2-1). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

Video Settings

1. Use the Up and Down buttons to move the cursor to "Video," then press the Enter button to display the Video Status screen for the video output card.

2. Press the Enter button again to display the Edit screen for the video output.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Select Format Setting

When in "Auto" mode, the unit will automatically pick the format which is closest to the native format of the decoded video in the elementary stream. When in "Manual" mode, the format may be selected from the list of available output formats listed under "Video Format" below.

1  Use the Up and Down buttons to move the cursor to "Select Format," then press the Enter button.

2  Use the Up and Down buttons to select either "Auto" or "Manual" mode, then press the Enter button to save the selection.

Video Format

Note: This menu is only available if the "Select Format" option is set to "Manual."

1  Use the Up and Down button to move the cursor to "Format," then press the Enter button.

2  Use the Up and Down buttons to select the desired output format, then press the Enter button to save the selection.

<table>
<thead>
<tr>
<th>Format</th>
<th>H:W</th>
<th>Frames</th>
<th>Format</th>
<th>H:W</th>
<th>Frames</th>
</tr>
</thead>
<tbody>
<tr>
<td>720x480i</td>
<td>16x9</td>
<td>29.97</td>
<td>1280x720p</td>
<td>16x9</td>
<td>50.00</td>
</tr>
<tr>
<td>720x480i</td>
<td>4x3</td>
<td>29.97</td>
<td>1920x1080i</td>
<td>16x9</td>
<td>29.97</td>
</tr>
<tr>
<td>720x576i</td>
<td>16x9</td>
<td>25.00</td>
<td>1920x1080PsF</td>
<td>16x9</td>
<td>23.98</td>
</tr>
<tr>
<td>720x576i</td>
<td>4x3</td>
<td>25.00</td>
<td>1920x1080PsF</td>
<td>16x9</td>
<td>23.98</td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>50.00</td>
<td>1920×1080p</td>
<td>16×9</td>
<td>23.98</td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>59.94</td>
<td>1920×1080p</td>
<td>16×9</td>
<td>23.98</td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>60.00</td>
<td>1920×1080p</td>
<td>16×9</td>
<td>23.98</td>
</tr>
<tr>
<td>1920x1080i</td>
<td>16x9</td>
<td>25.00</td>
<td>1920×1080p</td>
<td>16×9</td>
<td>29.97</td>
</tr>
<tr>
<td>1920×1080p</td>
<td>16×9</td>
<td>25.00</td>
<td>1920×1080p</td>
<td>16×9</td>
<td>30.00</td>
</tr>
</tbody>
</table>

Note: If either 480i or 576i video format is used, the HD-SDI outputs are turned off and only the analog output is enabled.
Analog Output Format

**Note:** If this setting is set incorrectly when using an RGB monitor, the image will appear green. If this setting is set incorrectly when using a Component monitor, there will be no video on the monitor.

1. Use the **Up** and **Down** buttons to move the cursor to "Anlg Out," then press the **Enter** button.

   ![Analog Output Format](image)

2. Use the **Up** and **Down** buttons to select the desired output format ("RGBHV", "YPbPr"), then press the **Enter** button to save the selection.

Display Mode

1. Use the **Up** and **Down** buttons to move the cursor to "Disp Mode," then press the **Enter** button.

   ![Display Mode](image)

2. Use the **Up** and **Down** buttons to select the desired output size ("Letterbox", "Cropped"), then press the **Enter** button to save the selection.

Auto AFD

The Active Format Description (AFD) is a standard set of codes that if sent in the MPEG transport stream, it is interpreted by the D9887B receiver into a certain aspect ratio and active picture characteristics.

1. Use the **Up** and **Down** buttons to move the cursor to "Auto AFD," then press the **Enter** button.

   ![Auto AFD](image)

2. Use the **Up** and **Down** buttons to select the appropriate mode (Enabled or Disabled), then press the **Enter** button to save the selection.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Video Shift

Video Shift provides a horizontal and vertical shift of the video output.

1. Use the Up and Down buttons to move the cursor to "H-shift," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the horizontal step (-50 – +50 steps, where the minus direction moves the video down), then press the Enter button to save the selection.

3. Use the Up and Down buttons to move the cursor to "V-shift," then press the Enter button.

4. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the vertical step (-50 – +50 steps, where the minus direction moves the video to the left), then press the Enter button to save the selection.

SDI Video Loss Mode Setting

This setting determines what is output by the decoder when input is lost.

1. Use the Up and Down buttons to move the cursor to "SDI Vid Loss Mode," then press the Enter button.

2. Use the Up and Down buttons to select the desired video output when the input is lost ("Display Raster" or "Disable Output"), then press the Enter button to save the selection.
Video Output (2 HD-SDI, 1 RGBHV/YPbPr) Option

**Raster Color**
This setting determines the color of the raster that is output by the decoder when input is lost.

1. Use the **Up** and **Down** buttons to move the cursor to "Raster Color," then press the **Enter** button.

   ![HD Video 2-1 Video Loss Mode: Display Raster Raster Color: Black]

2. Use the **Up** and **Down** buttons to select the desired raster color ("Black", "White", "Yellow", "Cyan", "Green", "Magenta", "Red", "Blue"), then press the **Enter** button to save the selection.

**VANC Embedding**
This controls the embedding of the Ancillary Data Packs (ADP) into the VANC of the SDI output.

1. Use the **Up** and **Down** buttons to move the cursor to "SDI VANC Assignment," then press the **Enter** button to view the Status screen.

   ![HD Video 2-1 Video SDI VANC Assignment Genlock Offset]

2. Press the **Enter** button once more to display the edit menu.

3. Use the **Up** and **Down** buttons to move the cursor to the desired type of Ancillary Data Packet ("EIA-608CC", "EIA-708CC", "TTX S2031M", "Source ID", or "SCTE 127", "AFD"), then press the **Enter** button.

   ![SDI VANC 2-1 ADP EIA-608CC:disabled Line:9]

4. Use the **Up** and **Down** buttons to choose "Enabled" or "Disabled," then press the **Enter** button to save the selection.
5 Use the Up and Down buttons to select "Line" for the ADP and press the Enter button.

6 Use the Up and Down buttons to change the line number (4 – 15) in which the ancillary data will be located.

Note: Use the above steps 3-6 to embed other components on other lines.

Genlock Offset

The Video Output (2 HD-SDI, 1 RGBHV/YPbPr) option HD video output card can be Genlocked to a standard "black and burst" or Tri-level sync signal, applied to the Genlock input on the back panel. The frame rate of the "black and burst" signal must be the same as the frame rate of the video output. The "Genlock Reference," under the Menu button, must be set to the type of Genlock signal being used as well. If the Genlock input source is lost, the red Error LED will illuminate, a Decoder Error will show, and the Error list will show the error. The video will restore but will not be Genlocked until the Genlock signal is restored.

Use the Up and Down buttons to move the cursor to "Genlock Offset," then press the Enter button.

Vertial

1 Use the Up and Down buttons to move the cursor to "Vert," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the number of lines, then press the Enter button to save the selection.
Vertical

1. Use the Up and Down buttons to move the cursor to "Vert," then press the Enter button.
2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the number of lines, then press the Enter button to save the selection.

Note: The maximum amount of offset is determined by the format of the video set.

Overlay Settings

Overlays provide an easy way to help troubleshoot problems, monitor stream characteristics, or decode closed captioning.

CAUTION: All overlays will appear on the downstream video.

Use the Up and Down buttons to move the cursor to "Overlay," then press the Enter button.

Type of Overlay

1. Use the Up and Down buttons to move the cursor to "Type," then press the Enter button.

2. Use the Up and Down buttons to select which overlay to display ("Off", "Closed Caption", "Service", "Table", "Subtitle"), then press the Enter button to save the selection.

Note: The "1" in "Overlay 1" refers to the RDS.
Chapter 4     Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Overlay (Closed Caption)

**Note:** This menu changes depending on which overlay is set in "Type of Overlay" above.

1. Use the **Up** and **Down** buttons to move the cursor to "Overlay," then press the **Enter** button.

   ![Overlay Menu](image)

2. Use the **Up** and **Down** buttons to select the appropriate type of overlay ("NTSC" or "DTVCC"), then press the **Enter** button to save the selection.

NTSC Closed Captions

**Note:** This option will only be available if the TYPE of overlay is set to "Closed Caption" and the "Overlay" is set to "NTSC."

1. Use the **Up** and **Down** buttons to move the cursor to "NTSC Srvc," then press the **Enter** button.

   ![NTSC Overlay Menu](image)

2. Use the **Up** and **Down** buttons to select the desired number of closed caption to view (1-4), then press the **Enter** button to save the selection.

DTVCC Closed Captions

**Note:** This option will only be available if the TYPE of overlay is set to "Closed Caption" and the "Overlay" is set to "DTVCC."

1. Use the **Up** and **Down** buttons to move the cursor to "DTVCC Srvc," then press the **Enter** button.

   ![DTVCC Overlay Menu](image)

2. Use the **Up** and **Down** buttons to select the desired number of closed caption to view (1-7), then press the **Enter** button to save the selection.
Video Output (2 HD-SDI, 1 RGBHV/YPbPr) Option

Overlay (Table)

**Note:** This menu changes depending on which overlay is set in "Overlay."

1. Use the Up and Down buttons to move the cursor to "Overlay," then press the Enter button.

```
↑↓ Overlay 1   ↓
Type: Table
  ▶ Overlay: PSI PAT
  ▶ Screen Interaction
```

2. Use the Up and Down buttons to select the appropriate type of overlay ("PSI PAT", "PSI PMT", "ATSC MGT", "ATSC STT", "ATSC TVCT", "ATSC EIT", "ATSC EPG"), then press the Enter button to save the selection.

Screen Interaction

This mode allows the user to page through the on-screen PSI/ATSC tables.

**Note:** This option is only available if the type of overlay is set to "Table."

1. Use the Up and Down buttons to move the cursor to "Screen Interaction," then press the Enter button.

```
↑↓ Overlay 1   ↓
Type: Table
  ▶ Overlay: PSI PMT
  ▶ Screen Interaction
```

2. While this mode is enabled, the Up, Down, Left, and Right buttons will control the on-screen PSI/ATSC tables. To exit the "Screen Interaction" mode, press the Exit button.

Coordinated Universal Time Offset

1. Use the Up and Down buttons to move the cursor to "Utc Offset," then press the Enter button.

```
↑↓ Overlay 1   ↓
Screen Interaction
  ▶ Utc Offset: -06:00
     Central
```

2. Use the Up and Down buttons to change to the appropriate offset, then press the Enter button to save the selection.

**Note:** The UTC values and their offsets are listed in *Appendix D - Coordinated Universal Time* (on page 307).
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Overlay (Service)

This option only displays the Service Info.

Overlay (Subtitle)

This overlays the DVB Subtitles. The subtitle is selected by choosing the language to display. Only the available languages that are present can be selected. When an input without DVB Subtitles is used, no language can be selected.

Note: This menu changes depending on which overlay is set in "Overlay."

1  Use the Up and Down buttons to move the cursor to "Lang," then press the Enter button.

2  Use the Up and Down buttons to select the language from those that are present, then press the Enter button to save the selection.

Small Format Display

To setup the D9887B receiver to output a "Small Format Display," use the following steps:

1  Use the Up and Down buttons to move the cursor to "Small Format Disp," then press the Enter button. This shows the status display.

2  Press the Enter button again to change the settings.

Format

This output format is used whenever a small format (less than 720x480 or 720x567) is received. The small format video is placed in the output format specified here in the position defined by the "SFD Location" setting.
Video Output (2 HD-SDI, 1 RGBHV/YPbPr) Option

1. While the cursor is on "Format," press the **Enter** button to change the display format.

   ![Format Screen](image)

   - **SFD Location:** Top-Lt
   - **Format:** 1920x1080i
   - **Aspect Ratio:** 16x9
   - **Frequency:** 29.97 Hz

2. Use the **Up** and **Down** buttons to change from any of the format settings.

3. Press the **Enter** button to save the settings.

<table>
<thead>
<tr>
<th>Format</th>
<th>Aspect Ratio</th>
<th>Frequency</th>
<th>Aspect Ratio</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>720x480i</td>
<td>16x9</td>
<td>29.97</td>
<td>1920x1080i</td>
<td>16x9</td>
</tr>
<tr>
<td>720x480i</td>
<td>4x3</td>
<td>29.97</td>
<td>1920x1080i</td>
<td>16x9</td>
</tr>
<tr>
<td>720x576i</td>
<td>16x9</td>
<td>25.00</td>
<td>1920x1080PsF</td>
<td>16x9</td>
</tr>
<tr>
<td>720x576i</td>
<td>4x3</td>
<td>25.00</td>
<td>1920x1080PsF</td>
<td>16x9</td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>50.00</td>
<td>1920x1080p</td>
<td>16x9</td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>59.94</td>
<td>1920x1080p</td>
<td>16x9</td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>60.00</td>
<td>1920x1080p</td>
<td>16x9</td>
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<tr>
<td>1920x1080i</td>
<td>16x9</td>
<td>25.00</td>
<td>1920x1080p</td>
<td>16x9</td>
</tr>
<tr>
<td>1920x1080p</td>
<td>16x9</td>
<td>30.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SFD Location**

1. Use the **Up** and **Down** button to move the cursor to "SFD Location," and then press the **Enter** button.

   ![SFD Location Screen](image)

   - **SFD Location:** Top-Lt

2. Use the **Up** and **Down** buttons to select one of "Top-Lt", "Mid-Lt", "Btm-Lt", "Top-Rt", "Mid-Rt", "Btm-Rt", "Top-Ctr", "Mid-Ctr", "Btm-Ctr", then press the **Enter** button to save the settings.
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Video Output (1 RGBHV/YPbPr, 1 Composite) Option

General Information

Install Location: 1-1 or (2-1 only on Configuration 2 units)

I/O: (1) 75Ω Female BNC NTSC/PAL Composite output, (1) 15-pin D-sub Female analog output

Supported Formats: NTSC/PAL Composite, YPbPr, RGBHV

Description: Analog only, video output card that can output either high definition or standard definition formats. There are two outputs on the card. One BNC for composite and one 15-pin D-sub for composite.

Output Control

1. Press the Output button.
   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2. Use the Up and Down buttons to move the cursor to the "Anlg Video" card of the specific slot (e.g. 1-1), then press the Enter button. Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

Video Settings

1. Use the Up and Down buttons to move the cursor to "Video," then press the Enter button to display the Video status screen for the video output card.

2. Press the Enter button again to display the Edit screen for the video output card.
Select Format Setting

When in "Auto" mode, the unit will automatically pick the format which is closest to the native format of the decoded video in the elementary stream. When in "Manual" mode, the format may be selected from the list of available output formats listed under "Video Format" below.

1. Use the Up and Down buttons to move the cursor to "Select Format," then press the Enter button.

2. Use the Up and Down buttons to select either "Auto" or "Manual" mode, then press the Enter button to save the selection.

Video Format

Note: This menu is only available if the "Select Format" option is set to "Manual."

1. Use the Up and Down buttons to move the cursor to "Format," then press the Enter button.

2. Use the Up and Down buttons to select the appropriate output format, then press the Enter button to save the selection.

<table>
<thead>
<tr>
<th>Format</th>
<th>Aspect Ratio</th>
<th>Frame Rate</th>
<th>480x720p</th>
<th>720x720p</th>
<th>720x576i</th>
<th>1920x1080i</th>
</tr>
</thead>
<tbody>
<tr>
<td>720x480i</td>
<td>16x9</td>
<td>29.97</td>
<td>1280x720p</td>
<td>16x9</td>
<td>59.94</td>
<td></td>
</tr>
<tr>
<td>720x480i</td>
<td>4x3</td>
<td>29.97</td>
<td>1280x720p</td>
<td>16x9</td>
<td>60.00</td>
<td></td>
</tr>
<tr>
<td>720x576i</td>
<td>16x9</td>
<td>25.00</td>
<td>1920x1080i</td>
<td>16x9</td>
<td>25.00</td>
<td></td>
</tr>
<tr>
<td>720x576i</td>
<td>4x3</td>
<td>25.00</td>
<td>1920x1080i</td>
<td>16x9</td>
<td>29.97</td>
<td></td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>50.00</td>
<td>1920x1080i</td>
<td>16x9</td>
<td>30.00</td>
<td></td>
</tr>
</tbody>
</table>

Analog Output Format

Note: If this setting is set incorrectly when using an RGB monitor, the image will appear green. If this setting is set incorrectly when using a Component monitor, there will be no video on the monitor.
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1 Use the **Up** and **Down** buttons to move the cursor to "Anlg Out," then press the **Enter** button.

```
Anlg Video 1-1  ↓
Format:1920x1080i
16x9  29.97
Anlg Out:RGBHV
```

2 Use the **Up** and **Down** buttons to select the desired output format ("RGBHV", "YPbPr"), then press the **Enter** button to save the selection.

**NTSC Ped**

When the NTSC Ped is enabled it applies a 7.5 IRE offset to the black level of the Composite video output.

1 Use the **Up** and **Down** buttons to move the cursor to "Format," then press the **Enter** button.

```
Anlg Video 1-1  ↓
NTSC offset:Enabled
Disp Mode:Letterbox
Raster Color:Black
```

2 Use the **Up** and **Down** buttons to select "Enabled" or "Disabled," then press the **Enter** button to save the selection.

**Display Mode**

1 Use the **Up** and **Down** buttons to move the cursor to "Disp Mode," then press the **Enter** button.

```
Anlg Video 1-1  ↓
NTSC offset:Enabled
Disp Mode:Letterbox
Raster Color:Black
```

2 Use the **Up** and **Down** buttons to select either "Letterbox" or "Cropped," then press the **Enter** button to save the selection.

**Auto AFD**

The Active Format Description (AFD) is a standard set of codes that if sent in the MPEG transport stream, it is interpreted by the D9887B receiver into a certain aspect ratio and active picture characteristics.

1 Use **Up** the **Down** and buttons to move the cursor to "Auto AFD," then press the **Enter** button.
2 Use **Up** the **Down** and buttons to select the appropriate mode ("Enabled" or "Disabled"), then press the **Enter** button to save the selection.

**Video Shift**

Video Shift provides a horizontal and vertical shift of the video output.

1 Use the **Up** and **Down** buttons to move the cursor to "H-shift," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the horizontal step (-50 - +50 steps, where the minus direction moves the video down), then press the **Enter** button to save the selection.

3 Use the **Up** and **Down** buttons to move the cursor to "V-shift," then press the **Enter** button.

4 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the vertical step (-50 - +50 steps, where the minus direction moves the video to the left), then press the **Enter** button to save the selection.

**Raster Color**

1 Use the **Up** and **Down** buttons to move the cursor to "Raster Color," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select the desired raster color ("Black", "White", "Yellow", "Cyan", "Green", "Magenta", "Red", "Blue"), then press the **Enter** button to save the selection.
Composite VBI Assignment

To edit the Composite VBI Assignment, use the following steps:

1. Use the Up and Down buttons to move the cursor to "Cmpst VBI Assignment," then press the Enter button to display the status screen for the VBI.

2. Press the Enter button once more to enter the Edit screen.

NTSC Waveforms

To enable NTSC items, use the following steps:

1. Use the Up and Down buttons to move the cursor to "Line21 CC," then press the Enter button.

2. Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

   Note: Repeat steps 1-2 above to change AMOL and TVG2x.

PAL Waveforms

To enable PAL items, use the following steps:

1. Use the Up and Down buttons to move the cursor to "TTX," then press the Enter button.

2. Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

   Note: Repeat steps 1-2 above to change VPS and WSS.
Overlay Settings

**CAUTION:** If Info (PSI/PSIP) data is turned on, the overlay will appear on downstream video. The same is true if Closed Caption overlay is turned on.

Use the **Up** and **Down** buttons to move the cursor to "Overlay," then press the **Enter** button.

1. Use the Up and Down buttons to move the cursor to "Type," then press the **Enter** button.
2. Use the Up and Down buttons to select which overlay to display ("Off", "Closed Caption", "Service", "Table", "Subtitle"), then press the **Enter** button to save the selection.

**Note:** The "1" in "Overlay 1" refers to the RDS.

Overlay (Closed Caption)

**Note:** This menu changes depending on which overlay is set in "Type of Overlay" above.

1. Use the Up and Down buttons to move the cursor to "Overlay," then press the **Enter** button.
2. Use the Up and Down buttons to select the appropriate type of overlay ("NTSC" or "DTVCC"), then press the **Enter** button to save the selection.
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NTSC Closed Captions

Note: This option will only be available if the TYPE of overlay is set to "Closed Caption" and the "Overlay" is set to "NTSC."

1  Use the Up and Down buttons to move the cursor to "NTSC Srvc," then press the Enter button.

2  Use the Up and Down buttons to select the desired number of closed caption to view (1-4), then press the Enter button to save the selection.

DTVCC Closed Captions

Note: This option will only be available if the TYPE of overlay is set to "Closed Caption" and the "Overlay" is set to "DTVCC."

1  Use the Up and Down buttons to move the cursor to "DTVCC Srvc," then press the Enter button.

2  Use the Up and Down buttons to select the desired number of closed caption to view (1-7), then press the Enter button to save the selection.

Overlay (Table)

Note: This menu changes depending on which overlay is set in "Overlay."

1  Use the Up and Down buttons to move the cursor to "Overlay," then press the Enter button.

2  Use the Up and Down buttons to select the appropriate type of overlay ("PSI PAT", "PSI PMT", "ATSC MGT", "ATSC STT", "ATSC TVCT", "ATSC EIT", "ATSC EPG"), then press the Enter button to save the selection.
**Screen Interaction**

This mode allows the user to page through the on-screen PSI/ATSC tables.

**Note:** This option is only available if the type of overlay is set to "Table."

1. Use the **Up** and **Down** buttons to move the cursor to "Screen Interaction," then press the **Enter** button.

2. While this mode is enabled, the **Up**, **Down**, **Left**, and **Right** buttons will control the on-screen PSI/ATSC tables. To exit the "Screen Interaction" mode, press the **Exit** button.

**Coordinated Universal Time Offset**

1. Use the **Up** and **Down** buttons to move the cursor to "Utc Offset," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to change to the appropriate offset, then press the **Enter** button to save the selection.

**Note:** The UTC values and their offsets are listed in *Appendix D - Coordinated Universal Time* (on page 307).

**Overlay (Service)**

**Note:** This option only displays the Service Info.
Overlay (Subtitle)

This overlays the DVB Subtitles. The subtitle is selected by choosing the language to display. Only the available languages that are present can be selected. When an input without DVB Subtitles is use, no language can be selected.

**Note:** This menu changes depending on which overlay is set in "Overlay."

1. Use the **Up** and **Down** buttons to move the cursor to "Lang," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select the language from those that are present, then press the **Enter** button to save the selection.

Genlock Offset

The Video output (1 RGBHV/YPbPr, 1 Composite) option card can be Genlocked to a standard "black and burst" signal applied to the Genlock input on the back panel. The frame rate of the "black and burst" signal must be the same as the frame rate of the video output. The "Genlock Reference," under the **Menu** button, must be set to the type of Genlock signal being used as well. If the Genlock input source is lost, the red "Error" LED will illuminate on the front panel, a description of the error will be shown in the "Active Errors" menu under the **Menu** button, and an entry will be logged in the event log. The video will restore but will not be Genlocked until the Genlock signal is restored.

**Note:** When the "Genlock Reference" is set to an SD source of NTSC or PAL, the "Genlock Offset" includes a "Color Ref" setting.

Use the **Up** and **Down** buttons to move the cursor to "Genlock Offset," then press the **Enter** button.
Vertical
1 Use the Up and Down buttons to move the cursor to "Vert," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the number of lines, then press the Enter button to save the selection.

   Note: The maximum amount of offset is determined by the format of the video set.

Horizontal
1 Use the Up and Down buttons to move the cursor to "Horiz," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the number of pixels, then press the Enter button to save the selection.

   Note: The maximum amount of offset is determined by the format of the video set.

Color Reference

   Note: The Color Reference is only available when the Genlock reference is SD.

1 Use the Up and Down buttons to move the cursor to "Color ref," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the LUUp and Down buttons to change the number of degrees (-180 - +180), then press the Enter button to save the selection.
Small Format Display

To setup the D9887B receiver to output a "Small Format Display," use the following steps:

1. Use the **Up** and **Down** buttons to move the cursor to "Small Format Disp," then press the **Enter** button.

2. Press the **Enter** button again to change the settings.

Format

1. While the cursor is on "Format," press the **Enter** button to change the display format.
2. Use the **Up** and **Down** buttons to change from any of the format settings.
3. Press the **Enter** button to save the settings.

<table>
<thead>
<tr>
<th>Format</th>
<th>Aspect</th>
<th>29.97</th>
<th>30.00</th>
<th>50.00</th>
<th>59.94</th>
</tr>
</thead>
<tbody>
<tr>
<td>720x480i</td>
<td>16x9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>720x480i</td>
<td>4x3</td>
<td>29.97</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>720x576i</td>
<td>16x9</td>
<td></td>
<td>25.00</td>
<td></td>
<td>25.00</td>
</tr>
<tr>
<td>720x576i</td>
<td>4x3</td>
<td>25.00</td>
<td></td>
<td>29.97</td>
<td></td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td></td>
<td>50.00</td>
<td></td>
<td>30.00</td>
</tr>
</tbody>
</table>

SFD Location

1. Use the **Up** and **Down** button to move the cursor to "SFD Location," and then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select "Top-Lt", "Mid-Lt", "Btm-Lt", Top-Rt", "Mid-Rt", "Btm-Rt", Top-Ctr", "Mid-Ctr", or "Btm-Ctr."
3. Press the **Enter** button to save the settings.
Audio Output (Dolby E, AES Digital, Analog) Option

General Information

Install Location: Any slot except 1-1 and 2-1.

I/O: (2) 75Ω Female BNC digital outputs, (1) 15-pin D-sub Male analog output

Supported Formats: Raw, PCM, Dolby E

Description: This card provides two digital audio outputs, and two analog audio pair outputs. The 8707A also adds the ability to parsed Dolby E compressed audio. It provides the audio from two audio decoder processors. Two cards can be installed to provide Raw and PCM digital audio outputs from four audio decoder processors (Only in Configuration 2 or Configuration 1 Dual Decoder units).

Output Control

1. Press the Output button.
   
   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2. Use the Up and Down buttons to move the cursor to the "Audio" card of the specific slot (e.g. 2-2), then press the Enter button. Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

3. Press the Enter button one more time to move from the Status screen to the Edit screen.
Chapter 4 Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Digital Audio Settings

1. Use the Up and Down buttons to move the cursor to "Out1," then press the Enter button.

   !↑ Audio 2-2
   ▶ Digital Audio:
   ▶ Out1:Audio 1 – PCM
   ▶ Out2:Audio 2 – PCM

2. Use the Up and Down buttons to select the audio decoder and output format desired ("Audio 1 – PCM", "Audio 1 – Raw", "Audio 2 – PCM", "Audio 2 - Raw", "Off"), then press the Enter button to save the selection.

   Note: The above steps apply to "Out2" as well.

   Note: The above formats apply to a Configuration 1 Single Decoder unit or any Configuration 2 unit. For a Configuration 1 Dual Decoder unit, the additional values of "Audio 3 – PCM", "Audio 3 – Raw", "Audio 4 – PCM", "Audio 4 - Raw" are available.

Analog Audio Settings

1. Use the Up and Down buttons to move the cursor to "Ch1," then press the Enter button.

   !↑ Audio 2-2
   ▶ Analog Audio:
   ▶ Ch1:Audio 1
   ▶ Ch2:Audio 2

2. Use the Up and Down buttons to select the desired audio to output ("Audio 1", "Audio 2", "Off"), then press the Enter button to save the selection.

   Note: The above steps apply to "Ch2" as well.

   Note: The above formats apply to a Configuration 1 Single Decoder unit or any Configuration 2 unit. For a Configuration 1 Dual Decoder unit, the additional values of "Audio 3" and "Audio 4" are available.

Output Level

Note: This setting is only available on the Audio Output (Dolby E AES Digital, Analog) option card.

1. Use the Up and Down buttons to move the cursor to "Level," then press the Enter button.

   !↑ Audio 2-2
   ▶ Ch1:Audio 1
   ▶ Ch2:Audio 2
   ▶ Level:1
2 Use the **Up** and **Down** buttons to select the desired level (1-9), then press **Enter** to save the selection.

**Note:** The level 7 is approximately 0 dB (when using a -20 dBFS reference level, see *Appendix E - D9887B Receiver Audio Explanation* (on page 311)) and each number increment is approx. 2.5 dB. Level 9 is approximately +4 dB (when using a -20 dBFS reference level, see *Appendix E - D9887B Receiver Audio Explanation* (on page 311)).
Dual Video Output (2 SDI, 1 RGBHV/YPbPr/Composite) Option

General Information

Install Location: 1-1 or (2-1 only on Configuration 2 units or Configuration 1 units with dual decoders)

I/O: (2) 75Ω HD-SDI Female BNC outputs, (1) 15-pin D-sub Female analog output

Supported Formats: HD-SDI, SD-SDI, YPbPr, RGBHV, and Composite

Description: This card provides three mirrored outputs from any of the available input option cards. Two of the outputs are any combination of HD-SDI or SD-SDI and one is analog YPbPr/RGBHV/Composite.

Output Control

1. Press the Output button.

2. Use the Up and Down buttons to move the cursor to the "HD/SD SDI Anlg Video" card of the specific slot (e.g. 2-1). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

Video Settings

1. Use the Up and Down buttons to move the cursor to "Video," then press the Enter button to display the Video Status screen for the video output card.

2. Press the Enter button again to display the Edit screen for the video output card.
Select Format Setting

When in "Auto" mode, the unit will automatically pick the format which is closest to the native format of the decoded video in the elementary stream. When in "Manual" mode, the format may be selected from the list of available output formats listed under "Video Format" below.

1. Use the Up and Down buttons to move the cursor to "Select Format," then press the Enter button.

   | SDI Anlg Vid 2-1 | Select Format: Manual |
   | Format: 1920x1080i | 16x9 29.97 |

2. Use the Up and Down buttons to select either "Auto" or "Manual" mode, then press the Enter button to save the selection.

Video Format

Note: This menu is only available if the "Select Format" option is set to "Manual."

1. Use the Up and Down button to move the cursor to "Format," then press the Enter button.

   | SDI Anlg Vid 2-1 | Select Format: Manual |
   | Format: 1920x1080i | 16x9 29.97 |

2. Use the Up and Down buttons to select the desired output format, then press the Enter button to save the selection.

<table>
<thead>
<tr>
<th>Format</th>
<th>Aspect Ratio</th>
<th>Refresh Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>720 x 480i</td>
<td>16x9</td>
<td>29.97</td>
</tr>
<tr>
<td>720 x 480i</td>
<td>4x3</td>
<td>29.97</td>
</tr>
<tr>
<td>720 x 576i</td>
<td>4x3</td>
<td>25.00</td>
</tr>
<tr>
<td>720 x 576i</td>
<td>16x9</td>
<td>25.00</td>
</tr>
<tr>
<td>1280 x 720p</td>
<td>16x9</td>
<td>60.00</td>
</tr>
<tr>
<td>1280 x 720p</td>
<td>16x9</td>
<td>59.94</td>
</tr>
<tr>
<td>1280 x 720p</td>
<td>16x9</td>
<td>50.00</td>
</tr>
<tr>
<td>1920 x 1080i</td>
<td>16x9</td>
<td>25.00</td>
</tr>
<tr>
<td>1920 x 1080i</td>
<td>16x9</td>
<td>29.97</td>
</tr>
<tr>
<td>1920 x 1080i</td>
<td>16x9</td>
<td>30.00</td>
</tr>
<tr>
<td>1920 x 1080i</td>
<td>16x9</td>
<td>30.00</td>
</tr>
</tbody>
</table>
SDI Output Setup

Follow the steps in this section to set the outputs to SD-SDI and HD-SDI.

1. Use the Up and Down button to move the cursor to "Output A," then press the Enter button.

2. Use the Up and Down buttons to select the desired output format ("Auto", "SD", "HD"), then press the Enter button to save the selection.

   **Note:** Repeat the steps above to change to the desired output setting for "Output B."

Analog Output Format

**Note:** If this setting is set incorrectly when using an RGB monitor, the image will appear green. If this setting is set incorrectly when using a Component monitor, there will be no video on the monitor.

1. Use the Up and Down buttons to move the cursor to "Anlg Out," then press the Enter button.

2. Use the Up and Down buttons to select the desired output format ("RGBHV", "YPbPr", "RGB SoG"), then press the Enter button to save the selection.

3. Use the Up and Down buttons to move the cursor to "NTSC Ped," then press the Enter button.

4. Use the Up and Down buttons to change the "NTSC Ped" to either "Black 0" or "Black 7.5", then press the Enter button to save the selection.
Dual Video Output (2 SDI, 1 RGBHV/YPbPr/Composite) Option

Raster Color

This setting determines the color of the raster that is output by the decoder when input is lost.

1 Use the Up and Down buttons to move the cursor to "Raster Color," then press the Enter button.

2 Use the Up and Down buttons to select the desired raster color ("Black", "White", "Yellow", "Cyan", "Green", "Magenta", "Red", "Blue"), then press the Enter button to save the selection.

HD Settings

1 Use the Up and Down buttons to move the cursor to "HD Settings," then press the Enter button to display the Status screen for the HD video output settings.

2 Press the Enter button again to display the Edit screen for the HD video output settings.

Display Mode

1 Use the Up and Down buttons to move the cursor to "Disp Mode," then press the Enter button.

2 Use the Up and Down buttons to select the desired output size ("Pillarbars", "Cropped"), then press the Enter button to save the selection.
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Video Loss Mode
1  Use the **Up** and **Down** buttons to move the cursor to "Video Loss Mode," then press the **Enter** button.

2  Use the **Up** and **Down** buttons to choose between ("Display Raster", "Disable Output"), then press the **Enter** button to save the selection.

Auto AFD
1  Use the **Up** and **Down** buttons to move the cursor to "Auto AFD," then press the **Enter** button.

2  Use the **Up** and **Down** buttons to set "Enabled" or "Disabled," then press the **Enter** button to save the selection.

Video Shift
Video Shift provides a horizontal and vertical shift of the video output.
1  Use the **Up** and **Down** buttons to move the cursor to "H-shift," then press the **Enter** button.

2  Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the horizontal step (-50 to +50 steps, where the minus direction moves the video down), then press the **Enter** button to save the selection.

3  Use the **Up** and **Down** buttons to move the cursor to "V-shift," then press the **Enter** button.
4 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the vertical step (-50 – +50 steps, where the minus direction moves the video to the left), then press the **Enter** button to save the selection.

**SDI VANC Assignment**

To edit the SDI VANC Assignment, use the following steps.

1. Use the **Up** and **Down** buttons to move the cursor to "SDI VANC Assign," then press the **Enter** button to display the status screen for the VANC.

2. Press the **Enter** button once more to enter the Edit screen.

**Ancillary Data Packets**

This controls the embedding to the Ancillary Data Packets (ADP) into the VANC of the SDI output.

1. Use the **Up** and **Down** buttons to move the cursor to the desired type of Ancillary Data Packet ("EIA-608CC", "EIA-708CC", "TTX S2031M", "Source ID", or "SCTE 127", "AFD"), then press the **Enter** button.

2. Use the **Up** and **Down** buttons to choose "Enabled" or "Disabled," then press the **Enter** button to save the selection.

3. Use the **Up** and **Down** buttons to select "Line" for the ADP and press the **Enter** button.

4. Use the **Up** and **Down** buttons to change the line number (4 – 15) in which the ancillary data will be located.

**Note:** Repeat steps 1-4 above to change EIA-708CC, TTX S2031M, Source ID, SCTE-127 and AFD.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

SD Settings

1 Use the Up and Down buttons to move the cursor to "SD Settings," then press the Enter button to display the Status screen for the SD video output settings.

2 Press the Enter button again to display the Edit screen for the SD video output settings.

Display Mode

1 Use the Up and Down buttons to move the cursor to "Disp Mode," then press the Enter button.

2 Use the Up and Down buttons to select the desired output size ("Letterbox", "Anamorph", or "Cropped"), then press the Enter button to save the selection.

Video Loss Mode

1 Use the Up and Down buttons to move the cursor to "Video Loss Mode," then press the Enter button.

2 Use the Up and Down buttons to choose between ("Display Raster", "Disable Output"), then press the Enter button to save the selection.

Auto AFD

1 Use the Up and Down buttons to move the cursor to "Auto AFD," then press the Enter button.

2 Use the Up and Down buttons to enable or disable AFD, then press the Enter button to save the selection.
Dual Video Output (2 SDI, 1 RGBHV/YPbPr/Composite) Option

Video Shift

Video Shift provides a horizontal and vertical shift of the video output.

1. Use the **Up** and **Down** buttons to move the cursor to "H-shift," then press the **Enter** button.

```
<table>
<thead>
<tr>
<th>SD Settings 2-1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto AFD: Disabled</td>
<td></td>
</tr>
<tr>
<td>►H-Shift:+00 steps</td>
<td></td>
</tr>
<tr>
<td>◀V-Shift:+00 steps</td>
<td></td>
</tr>
</tbody>
</table>
```

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the horizontal step (-50 – +50 steps, where the minus direction moves the video down), then press the **Enter** button to save the selection.

3. Use the **Up** and **Down** buttons to move the cursor to "V-shift," then press the **Enter** button.

```
<table>
<thead>
<tr>
<th>SD Settings 2-1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto AFD: Disabled</td>
<td></td>
</tr>
<tr>
<td>◀-H-Shift:+00 steps</td>
<td></td>
</tr>
<tr>
<td>◀V-Shift:+00 steps</td>
<td></td>
</tr>
</tbody>
</table>
```

4. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the vertical step (-50 – +50 steps, where the minus direction moves the video to the left), then press the **Enter** button to save the selection.

SDI VANC Assignment

To edit the SDI VANC Assignment, use the following steps.

1. Use the **Up** and **Down** buttons to move the cursor to "SDI VANC Assign," then press the **Enter** button to display the status screen for the VANC.

```
<table>
<thead>
<tr>
<th>SD Settings 2-1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H-Shift:+00 steps</td>
<td></td>
</tr>
<tr>
<td>◀V-Shift:+00 steps</td>
<td></td>
</tr>
</tbody>
</table>
```

2. Press the **Enter** button once more to enter the Edit screen.
Ancillary Data Packets

This controls the embedding of the Ancillary Data Packets (ADP) into the VANC of the SDI output.

1. Use the Up and Down buttons to move the cursor to the desired type of Ancillary Data Packet ("EIA-608CC", "EIA-708CC", "TTX S2031M", "Source ID", or "SCTE 127", "AFD"), then press the Enter button.

2. Use the Up and Down buttons to choose "Enabled" or "Disabled," then press the Enter button to save the selection.

3. Use the Up and Down buttons to select "Line" for the ADP and press the Enter button.

4. Use the Up and Down buttons to change the line number (4 – 15) in which the ancillary data will be located, then press the Enter button.

Note: Repeat steps 1-4 above to change EIA-708CC, TTX S2031M, Source ID, SCTE-127 and AFD.

NTSC Waveforms

To enable NTSC items, use the following steps.

1. Use the Up and Down buttons to move the cursor to "Line 21CC," then press the Enter button.

2. Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

Note: Repeat steps 1-2 above to change AMOL and TVG2x.
PAL Waveforms

To enable PAL items, use the following steps.

1. Use the Up and Down buttons to move the cursor to "TTX," then press the Enter button.

2. Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

Note: Repeat steps 1-2 above to change VPS and WSS.

Composite VBI Assignment

To edit the Composite VBI Assignment, use the following steps.

1. Use the Up and Down buttons to move the cursor to "Cmpst VBI Assignment," then press the Enter button to display the status screen for the VBI.

2. Press the Enter button once more to enter the Edit screen.

NTSC Waveforms

To enable NTSC items, use the following steps.

1. Use the Up and Down buttons to move the cursor to "Line21 CC," then press the Enter button.

2. Use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

Note: Repeat steps 1-2 above to change AMOL and TVG2x.
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PAL Waveforms

To enable PAL items, use the following steps.

1  Use the Up and Down buttons to move the cursor to "TTX," then press the Enter button.

2  Use the Down buttons to select "Enabled" or "Disabled," then press the Enter button to save the selection.

Note: Repeat steps 1-2 above to change VPS and WSS.

Genlock Offset

The Dual Video output (2 SDI, 1 RGBHV/YPbPr/Composite) option can be Genlocked to a standard "black and burst" signal applied to the Genlock input on the back panel. The frame rate of the "black and burst" signal must be the same as the frame rate of the video output. The "Genlock Reference," under the Menu button, must be set to the type of Genlock signal being used as well. If the Genlock input source is lost, the red "Error" LED will illuminate on the front panel, a description of the error will be shown in the "Active Errors" menu under the Menu button, and an entry will be logged in the event log. The video will restore but will not be Genlocked until the Genlock signal is restored.

When the "Genlock Reference" is set to an SD source of NTSC or PAL, the "Genlock Offset" includes a "Color Ref" setting.

Use the Up and Down buttons to move the cursor to "Genlock Offset," then press the Enter button.

Vertical

1  Use the Up and Down buttons to move the cursor to "Vert," then press the Enter button.
2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the number of lines, then press the **Enter** button to save the selection.

**Note:** The maximum amount of offset is determined by the format of the video set.

### Horizontal

1 Use the **Up** and **Down** buttons to move the cursor to "Horiz," then press the **Enter** button.

```
↓↑ Genlock Offset  ↓
Vert: -125 lines
Horiz: -0177 pixels
Color Ref: -100
```

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the number of pixels, then press the **Enter** button to save the selection.

**Note:** The maximum amount of offset is determined by the format of the video set.

### Color Reference

**Note:** The Color Reference is only available when the Genlock reference is SD.

1 Use the **Up** and **Down** buttons to move the cursor to "Color ref," then press the **Enter** button.

```
↓↑ Genlock Offset  ↓
Vert: -125 lines
Horiz: -0177 pixels
Color Ref: -100
```

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the number of degrees (-180 - +180), then press the **Enter** button to save the selection.

### Overlay Settings

Overlays provide an easy way to help troubleshoot problems, monitor stream characteristics, or decode closed captioning.

**CAUTION:** All overlays will appear on the downstream video.
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Use the Up and Down buttons to move the cursor to "Overlay," then press the Enter button.

Type of Overlay
1  Use the Up and Down buttons to move the cursor to "Type," then press the Enter button.

2  Use the Up and Down buttons to select which overlay to display ("Off", "Closed Caption", "Service", "Table", "Subtitle"), then press the Enter button to save the selection.

Note: The "1" in "Overlay 1" refers to the RDS.

Overlay (Closed Caption)
Note: This menu changes depending on which overlay is set in "Type of Overlay" above.
1  Use the Up and Down buttons to move the cursor to "Overlay," then press the Enter button.

2  Use the Up and Down buttons to select the appropriate type of overlay ("NTSC" or "DTVCC"), then press the Enter button to save the selection.

NTSC Closed Captions
Note: This option will only be available if the TYPE of overlay is set to "Closed Caption" and the "Overlay" is set to "NTSC."
1  Use the Up and Down buttons to move the cursor to "NTSC Srvc," then press the Enter button.
2 Use the **Up** and **Down** buttons to select the desired number of closed caption to view (1-4), then press the **Enter** button to save the selection.

**DTVCC Closed Captions**

*Note:* This option will only be available if the TYPE of overlay is set to "Closed Caption" and the "Overlay" is set to "DTVCC."

1 Use the **Up** and **Down** buttons to move the cursor to "DTVCC Srvc," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select the desired number of closed caption to view (1-7), then press the **Enter** button to save the selection.

**Overlay (Table)**

*Note:* This menu changes depending on which overlay is set in "Overlay."

1 Use the **Up** and **Down** buttons to move the cursor to "Overlay," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select the appropriate type of overlay ("PSI PAT", "PSI PMT", "ATSC MGT", "ATSC STT", "ATSC TVCT", "ATSC EIT", "ATSC EPG"), then press the **Enter** button to save the selection.

**Screen Interaction**

This mode allows the user to page through the on-screen PSI/ATSC tables.

*Note:* This option is only available if the type of overlay is set to "Table."

1 Use the **Up** and **Down** buttons to move the cursor to "Screen Interaction," then press the **Enter** button.

2 While this mode is enabled, the **Up**, **Down**, **Left**, and **Right** buttons will control the on-screen PSI/ATSC tables. To exit the "Screen Interaction" mode, press the **Exit** button.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Coordinated Universal Time Offset

1  Use the Up and Down buttons to move the cursor to "Utc Offset," then press the Enter button.

2  Use the Up and Down buttons to change to the appropriate offset, then press the Enter button to save the selection.

Note: The UTC values and their offsets are listed in Appendix D - Coordinated Universal Time (on page 307).

Overlay (Service)

This option only displays the Service Info.

Overlay (Subtitle)

This overlays the DVB Subtitles. The subtitle is selected by choosing the language to display. Only the available languages that are present can be selected. When an input without DVB Subtitles is used, no language can be selected.

Note: This menu changes depending on which overlay is set in "Overlay."

1  Use the Up and Down buttons to move the cursor to "Lang," then press the Enter button.

2  Use the Up and Down buttons to select the language from those that are present, then press the Enter button to save the selection.

Small Format Display

To setup the D9887B receiver to output a "Small Format Display," use the following steps:
Use the **Up** and **Down** buttons to move the cursor to "Small Format Disp," then press the **Enter** button.

- Press the **Enter** button again to change the settings.

### Format

This output format is used whenever a small format (less than 720x480 or 720x567) is received. The small format video is placed in the output format specified here in the position defined by the "SFD Location" setting.

1. While the cursor is on "Output Format," press the **Enter** button to change the display format.

   ![Format Example]

2. Use the **Up** and **Down** buttons to change from any of the format settings.

3. Press the **Enter** button to save the settings.

<table>
<thead>
<tr>
<th>Format</th>
<th>Aspect Ratio</th>
<th>Frame Rate</th>
<th>Formatted</th>
<th>Aspect Ratio</th>
<th>Frame Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>720 x 480i</td>
<td>16x9</td>
<td>29.97</td>
<td>1920 x 1080i</td>
<td>16x9</td>
<td>30.00</td>
</tr>
<tr>
<td>720 x 480i</td>
<td>4x3</td>
<td>29.97</td>
<td>1920 x 1080PsF</td>
<td>16x9</td>
<td>23.98</td>
</tr>
<tr>
<td>720 x 576i</td>
<td>4x3</td>
<td>25.00</td>
<td>1920 x 1080PsF</td>
<td>16x9</td>
<td>24.00</td>
</tr>
<tr>
<td>720 x 576i</td>
<td>16x9</td>
<td>25.00</td>
<td>1920 x 1080p</td>
<td>16x9</td>
<td>23.98</td>
</tr>
<tr>
<td>1280 x 720p</td>
<td>16x9</td>
<td>60.00</td>
<td>1920 x 1080p</td>
<td>16x9</td>
<td>24.00</td>
</tr>
<tr>
<td>1280 x 720p</td>
<td>16x9</td>
<td>59.94</td>
<td>1920 x 1080p</td>
<td>16x9</td>
<td>25.00</td>
</tr>
<tr>
<td>1280 x 720p</td>
<td>16x9</td>
<td>50.00</td>
<td>1920 x 1080p</td>
<td>16x9</td>
<td>29.97</td>
</tr>
<tr>
<td>1920 x 1080i</td>
<td>16x9</td>
<td>25.00</td>
<td>1920 x 1080p</td>
<td>16x9</td>
<td>30.00</td>
</tr>
<tr>
<td>1920 x 1080i</td>
<td>16x9</td>
<td>29.97</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

SFD Location

1. Use the Up and Down button to move the cursor to "SFD Location," and then press the Enter button.

2. Use the Up and Down buttons to select one "Top-Lt", "Mid-Lt", "Btm-Lt", "Top-Rt", "Mid-Rt", "Btm-Rt", "Top-Ctr", "Mid-Ctr", "Btm-Ctr", then press the Enter button to save the settings.
Dual Input DVB-S/DVB-S2 Receiver Option

General Information

Install Location: Any slot except 1-1 or 2-1.

I/O: (2) 75Ω Female F Connectors

Supported Formats: DVB-S/DVB-S2

Description: This card will input a satellite L-band (950 MHz – 2150 MHz) signal for demodulation of KU-band or C-band DVB-S QPSK signals or DVB-S2 QPSK/8PSK signals. The symbol rate ranges from 1 MSym/s to 45 MSym/s for DVB-S and 1-30 MSym/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 used at a time.

Note: This card does not provide power to the dish LNB.

To Edit the Option Card Input Settings

To edit this input card, use the following steps:

1. Press the Input button.

   ![Input menu]

   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2. Use the Up and Down buttons to select "Input Modules," and press the Enter button.

   ![Input menu]
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3 Use the **Up** and **Down** buttons to move the cursor to the "DVB-S/S2" card of the specific slot (e.g. 2-2). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

4 Press the **Enter** button once to display the Status screen for the DVB-S/S2 card.
5 Press the **Enter** button again to display the Edit screen for the DVB-S/S2 card.

**Source**

This option will select which input, on the back of the card, will be active.

1 Use the **Up** and **Down** buttons to move the cursor to "Source," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select which input to be active ("A", "B"), then press the **Enter** button to save the selection.

**Input A**

These settings correspond to the input on "Source A."

**DVB Mode**

The DVB-S/S2 card can receive either DVB-S or DVB-S2 transmission.

1 Use the **Up** and **Down** buttons to move the cursor to "DVB Mode," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select either "DVB-S" or "DVB-S2," then press the **Enter** button to save the selection.
Frequency A
The DVB-S/S2 card tunes by the L-band frequency rather than the transponder frequency or local oscillator value. The L-band frequency is the difference between the downlink transponder frequency and the LNB local oscillator frequency.

1. Use the **Up** and **Down** buttons to move the cursor to "Freq," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the frequency (950 MHz – 2150 MHz), then press the **Enter** button to save the selection.

Symbol Rate A

1. Use the **Up** and **Down** buttons to move the cursor to "Sym Rt," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the symbol rate (1 – 30 MSymbols/s).

3. Press the **Enter** button to save the selection.

Input B

These settings correspond to the input on "Source B."

DVB Mode

The DVB-S/S2 card can receive either DVB-S or DVB-S2 transmission.

1. Use the **Up** and **Down** buttons to move the cursor to "DVB Mode," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select either "DVB-S" or "DVB-S2," then press the **Enter** button to save the selection.
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Frequency B

The DVB-S/S2 card tunes by the L-band frequency rather than the transponder frequency or local oscillator value. The L-band frequency is the difference between the downlink transponder frequency and the LNB local oscillator frequency.

1. Use the Up and Down buttons to move the cursor to "Freq," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the frequency (950 MHz – 2150 MHz), then press the Enter button to save the selection.

Symbol Rate B

1. Use the Up and Down buttons to move the cursor to "Sym Rate," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit, and use the Up and Down buttons to change the symbol rate (1 – 30 MSymbols/s).

3. Press the Enter button to save the selection.
Dual Input ASM Receiver Option

General Information

Install Location: Any slot except 1-1 or 2-1.

I/O: (2) 75Ω Female F Connectors

Supported Formats: DVB-S/DVB-S2

Description: This card will input a satellite L-band (950 MHz – 2150 MHz) 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 0.256 MSym/s to 30 MSym/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.

Note: This card does not provide power to the dish LNB.

To Edit the Option Card Input Settings

To edit this input card, use the following steps:

1  Press the Input button.
   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2  Use the Up and Down buttons to select "Input Modules," and press the Enter button.
3. Use the **Up** and **Down** buttons to move the cursor to the "AdvPSK" card of the specific slot (e.g. 2-2). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

![Location Diagram](image1)

4. Press the **Enter** button once to display the Status screen for the Adv-PSK card.

5. Press the **Enter** button again to display the Edit screen for the Adv-PSK card.

### Source

This option will select which input, on the back of the card, will be active.

1. Use the **Up** and **Down** buttons to move the cursor to "Source," then press the **Enter** button.

   ![Source Menu](image2)

2. Use the **Up** and **Down** buttons to select which input to be active ("A", "B"), then press the **Enter** button to save the selection.

### Input A

These settings correspond to the input on "Source A."

#### Modulation Type A

1. Use the **Up** and **Down** buttons to move the cursor to "Mod," then press the **Enter** button.

   ![Modulation Menu](image3)

2. Use the **Up** and **Down** buttons to select the Modulation type, then press the **Enter** button to save the selection.

**Note:** The following Modulation types are settable:

<table>
<thead>
<tr>
<th>Modulation Type</th>
<th>Modulation Type</th>
<th>Modulation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVB-QPSK</td>
<td>Adv QPSK</td>
<td>8-PSK</td>
</tr>
<tr>
<td>DVB-QPSK 1/2</td>
<td>Adv QPSK 1/2</td>
<td>8-PSK 2/3</td>
</tr>
<tr>
<td>DVB-QPSK 2/3</td>
<td>Adv QPSK 2/3</td>
<td>8-PSK 3/4 (2.05)</td>
</tr>
</tbody>
</table>
Frequency A

The ASM card tunes by the L-band frequency rather than the transponder frequency or local oscillator value. The L-band frequency (950 – 2150 MHz) is the difference between the downlink transponder frequency and the LNB local oscillator frequency.

**Note:** If the values of "Freq" and "LO Off" result in a frequency that is out of the L-Band, an active error ("Band Freq Error") will be present while the tuning setting is outside of the L-Band.

1. Use the **Up** and **Down** buttons to move the cursor to "Freq," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the frequency (950 MHz – 14500 MHz), then press the **Enter** button to save the selection.

Local Oscillator Offset A

The ASM card offers an offset for the Local Oscillator frequency. This means that the D9887B receiver will calculate the actual frequency in which the card tunes; saving the user time and possible miscalculation errors. Follow the steps below to change the offset or set to zero for manual calculation.

1. Use the **Up** and **Down** buttons to move the cursor to "LO Off," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the Local Oscillator Offset (0 – 12000 MHz), then press the **Enter** button to save the selection.
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Symbol Rate A

1  Use the Up and Down buttons to move the cursor to "SymRt," then press the Enter button.

```
| SymRt: 00.256000MSPS |
```

2  Use the Left and Right buttons to select the column to edit, and use the Up and Down buttons to change the symbol rate (0.256 – 30 MSps).

3  Press the Enter button to save the selection.

Input B

These settings correspond to the input on "Source B."

Modulation Type B

1  Use the Up and Down buttons to move the cursor to "Mod," then press the Enter button.

```
| Mod: Adv QPSK 2/3 |
```

2  Use the Up and Down buttons to select Modulation type, then press the Enter button to save the selection.

**Note:** The following Modulation types are settable:

<table>
<thead>
<tr>
<th>DVB-QPSK</th>
<th>Adv QPSK</th>
<th>8-PSK</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVB-QPSK 1/2</td>
<td>Adv QPSK 1/2</td>
<td>8-PSK 2/3</td>
</tr>
<tr>
<td>DVB-QPSK 2/3</td>
<td>Adv QPSK 2/3</td>
<td>8-PSK 3/4 (2.05)</td>
</tr>
<tr>
<td>DVB-QPSK 5/6</td>
<td>Adv QPSK 5/6</td>
<td>8-PSK 3/4 (2.20)</td>
</tr>
<tr>
<td>DVB-QPSK 7/8</td>
<td>Adv QPSK 7/8</td>
<td>8-PSK 5/6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-PSK 8/9</td>
</tr>
</tbody>
</table>

Frequency B

The ASM card tunes by the L-band frequency rather than the transponder frequency or local oscillator value. The L-band frequency (950 – 2150 MHz) is the difference between the downlink transponder frequency and the LNB local oscillator frequency.
**Dual Input ASM Receiver Option**

**Note:** If the values of "Freq" and "LO Off" result in a frequency that is out of the L-Band, an active error ("Band Freq Error") will be present while the tuning setting is outside of the L-Band.

1. Use the **Up** and **Down** buttons to move the cursor to "Freq," then press the **Enter** button.

   ![Screen Shot]
   ```
   ↓↑  AdvPSK 2-2  ↓
   Mod:Adv QPSK 2/3
   ▶ Freq:01390.0 MHz
   LO Off:00000.0 MHz
   ```

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the frequency (950 MHz – 14500 MHz), then press the **Enter** button to save the selection.

**Local Oscillator Offset B**

The ASM card offers an offset for the Local Oscillator frequency. This means that the D9887B receiver will calculate the actual frequency in which the card tunes; saving the user time and possible miscalculation errors. Follow the steps below to change the offset or set to zero for manual calculation.

1. Use the **Up** and **Down** buttons to move the cursor to "LO Off," then press the **Enter** button.

   ![Screen Shot]
   ```
   ↓↑  AdvPSK 2-2  ↓
   Freq:01390.0 MHz
   ▶ LO Off:00000.0 MHz
   SymRt:00.256000MSps
   ```

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the Local Oscillator Offset (0 – 12000 MHz), then press the **Enter** button to save the selection.

**Symbol Rate B**

1. Use the **Up** and **Down** buttons to move the cursor to "SymRt," then press the **Enter** button.

   ![Screen Shot]
   ```
   ↓↑  AdvPSK 2-2  ↓
   Freq:01390.0 MHz
   ▶ LO Off:00000.0 MHz
   SymRt:00.256000MSps
   ```

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the symbol rate (0.256 – 30 MSps).

3. Press the **Enter** button to save the selection.
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**Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp) Option**

**General Information**

**Install Location:** This card can only be installed in location 2-1.

**I/O:** (2) 75Ω HD-SDI Female BNC outputs, (1) 15-pin D-sub Female analog output

**Supported Formats:** HD-SDI, SD-SDI, YPbPr, RGBHV, and Composite

**Description:** This card provides three mirrored outputs from any of the available input option cards. Two of the outputs are any combination of HD-SDI or SD-SDI and one is analog YPbPr/RGBHV/Composite.

**Note:** This output card option is only used with the MPEG-2 Decoder 4:2:2 with Genlock (1 Video, 4 Audio) option.

**Output Control**

1. Press the **Output** button.

2. Use the **Up** and **Down** buttons to move the cursor to the "HD Video" card of the specific slot (e.g. 2-1). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

**Video Settings**

1. Use the **Up** and **Down** buttons to move the cursor to "Video," then press the **Enter** button to display the Video Status screen for the video output card.

2. Press the **Enter** button again to display the Edit screen for the video output card.
Select Format Setting

When in "Auto" mode, the unit will automatically pick the format which is closest to the native format of the decoded video in the elementary stream. When in "Manual" mode, the format may be selected from the list of available output formats listed under "Video Format" below.

1. Use the Up and Down buttons to move the cursor to "Select Format," then press the Enter button.

2. Use the Up and Down buttons to select either "Auto" or "Manual" mode, then press the Enter button to save the selection.

Video Format

Note: This menu is only available if the "Select Format" option is set to "Manual".

1. Use the Up and Down button to move the cursor to "Format," then press the Enter button.

2. Use the Up and Down buttons to select the desired output format, then press the Enter button to save the selection.

These are the available manual set output formats:

<table>
<thead>
<tr>
<th>Format</th>
<th>Aspect Ratio</th>
<th>Frame Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>50.00</td>
</tr>
<tr>
<td>1920x1080i</td>
<td>16x9</td>
<td>59.94</td>
</tr>
<tr>
<td>1280x720p</td>
<td>16x9</td>
<td>60.00</td>
</tr>
</tbody>
</table>

HD Display Mode Setup

This sets the video frame conversion when the HD output video format has a different aspect ratio from the input video. "Letterbox" provides bars to fill the screen, either top and bottom (letterbox) or on each side (pillarbox). The "Cropped" setting expands (without distortion) the video so that it fills the video frame and deletes the parts that extend beyond the frame.
1. Use the **Up** and **Down** button to move the cursor to "Disp Mode," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select either "Letterbox" or "Cropped," then press the **Enter** button to save the selection.

### SD Mode Setup

This sets the video frame conversion when the SD output video format has a different aspect ratio form the input video. "Letterbox" provides bars to fill the screen, either top and bottom (letterbox) or on each side (pillarbox). The "Cropped" setting expands (without distortion) the video so that it fills the video frame and deletes the parts that extend beyond the frame. The "Anamorph" setting stretches the video to fit the full screen.

1. Use the **Up** and **Down** button to move the cursor to "SD Mode," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select either "Letterbox", "Cropped", or "Anamorph", then press the **Enter** button to save the selection.

### SD Output Setup

Follow the steps in this section to set the outputs to SD-SDI and HD-SDI.

1. Use the **Up** and **Down** button to move the cursor to "Output 1," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select the desired output format ("SD" or "HD"), then press the **Enter** button to save the selection.

**Note:** Repeat the steps above to change to the desired output setting for "Output 2."

**Note:** The frame rate of the SD output follows the setting that is set for the "Format:" entry in the "Video" settings.
Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp) Option

**Note:** When set to "SD," the NTSC formatted output will be used when the output video frame rate is 29.95 or 59.94. The PAL formatted output will be used when the frame rate is 25 or 50. Other frame rates will not produce an SD SDI output.

**SDI Output Squelch**

The SDI clock is used to disable the output when a video decoding error is encountered. When the SDI clock is set to "Squelch," there is no SDI output signal during the decoding failure. When the SDI clock is set to "Pass," the Raster color is output during decoding failure.

1. Use the **Up** and **Down** button to move the cursor to "SDI Clk," then press the **Enter** button.

   ![SDI Anlg Vid 2-1](image1)
   - Output 1:SD
   - Output 2:HD
   - SDI Clk:Pass

2. Use the **Up** and **Down** buttons to select the desired SDI Clk ("Pass" or "Squelch"), then press the **Enter** button to save the selection.

**Analog Output Format**

**Note:** If this setting is set incorrectly when using an RGB monitor, the image will appear green. If this setting is set incorrectly when using a Component monitor, there will be no video on the monitor.

1. Use the **Up** and **Down** buttons to move the cursor to "Anlg Out," then press the **Enter** button.

   ![SDI Anlg Vid 2-1](image2)
   - Analog
   - Anlg Out:RGBHV
   - NTSC Ped:Disabled

2. Use the **Up** and **Down** buttons to select the desired output format ("RGBHV" or "YPbPr"), then press the **Enter** button to save the selection.

3. Use the **Up** and **Down** buttons to move the cursor to "NTSC Ped," then press the **Enter** button.

   ![SDI Anlg Vid 2-1](image3)
   - Analog
   - Anlg Out:RGBHV
   - NTSC Ped:Disabled

4. Use the **Up** and **Down** buttons to select "Enabled" or "Disabled," then press the **Enter** button to save the selection.
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Display Mode

1. Use the **Up** and **Down** buttons to move the cursor to "Disp Mode," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select the desired output size ("Letterbox", "Cropped"), then press the **Enter** button to save the selection.

SD Mode

1. Use the **Up** and **Down** buttons to move the cursor to "SD Mode," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select the desired output size ("Letterbox", "Cropped", "Anamorph"), then press the **Enter** button to save the selection.

Raster Color

This setting determines the color of the raster that is output by the decoder when input is lost.

1. Use the **Up** and **Down** buttons to move the cursor to "Raster Color," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select the desired raster color ("Black", "White", "Yellow", "Cyan", "Green", "Magenta", "Red", "Blue"), then press the **Enter** button to save the selection.

HD SDI VANC Embedding

1. Use the **Up** and **Down** buttons to move the cursor to "HD SDI VANC Assign," then press the **Enter** button to view the Status screen.
Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp) Option

2 Press the **Enter** button once more to display the Edit menu.

3 Use the **Up** and **Down** buttons to move the cursor to "EIA-608CC," then press the **Enter** button.

```
| ▼⇅ SDI VANC 2-1 |
| ADP            |
| EIA-608CC:Disabled|
| Line:9         |
```

4 Use the **Up** and **Down** buttons to choose "Enabled" or "Disabled," then press the **Enter** button to save the selection.

5 Use the **Up** and **Down** buttons to select "Line," and press the **Enter** button.

```
| ▼⇅ SDI VANC 2-1 |
| ADP            |
| EIA-608CC:Disabled|
| Line:9         |
```

6 Use the **Up** and **Down** buttons to change the line number (9 – 15) in which the ancillary data will be located.

7 Press the **Enter** button once more to display the Edit menu.

8 Use the **Up** and **Down** buttons to move the cursor to "EIA-708CC," then press the **Enter** button.

9 Use the **Up** and **Down** buttons to choose "Enabled" or "Disabled," then press the **Enter** button to save the selection.

10 Use the **Up** and **Down** buttons to select "Line," and press the **Enter** button.

11 Use the **Up** and **Down** buttons to change the line number (9 – 15) in which the ancillary data will be located.

**SD SDI VANC Embedding**

1 Use the **Up** and **Down** buttons to move the cursor to "SD SDI VANC Assign," then press the **Enter** button to view the Status screen.

```
| ▼⇅SDI Anlg Vid 2-1 |
| Video              |
| HD SDI VANC Assign |
| SD SDI VANC Assign |
```

2 Press the **Enter** button once more to display the Edit menu.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

3  Use the **Up** and **Down** buttons to move the cursor to "EIA-608CC," then press the **Enter** button.

4  Use the **Up** and **Down** buttons to choose "Enabled" or "Disabled," then press the **Enter** button to save the selection.

5  Use the **Up** and **Down** buttons to select "Line," and press the **Enter** button.

6  Use the **Up** and **Down** buttons to change the line number (9 – 15) in which the ancillary data will be located.

7  Press the **Enter** button once more to display the Edit menu.

8  Use the **Up** and **Down** buttons to move the cursor to "EIA-708CC," then press the **Enter** button.

9  Use the **Up** and **Down** buttons to choose "Enabled" or "Disabled", then press the **Enter** button to save the selection.

10 Use the **Up** and **Down** buttons to select "Line," then press the **Enter** button.

11 Use the **Up** and **Down** buttons to change the line number (9 – 15) in which the ancillary data will be located.

**Composite VBI Assignment**

To setup Line 21 Closed Captions on the Composite output of this card, use the following steps:

1  Use the **Up** and **Down** buttons to move the cursor to "Cmpst VBI Assignment," then press the **Enter** button.

2  Use the **Up** and **Down** buttons to move the cursor to "Line21 CC," then press the **Enter** button on the selected option.
Then use the **Up** and **Down** buttons to toggle between "Enabled" and "Disabled," then press the **Enter** button to save changes.

### HD/SD Genlock Offset

The Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp) option card can be Genlocked to a standard "black and burst" or Tri-level sync signal applied to the Genlock input on the back panel. The frame rate of the "black and burst" signal must be the same as the frame rate of the video output. The "Genlock Reference," under the **Menu** button, must be set to the type of Genlock signal being used as well. If the Genlock input source is lost, the red Error LED will illuminate, a Decoder Error will show, and the Error list will show the error. The video will restore but will not be Genlocked until the Genlock signal is restored.

1. Use the **Up** and **Down** buttons to move the cursor to "HD Genlock Offset" or "SD Genlock Offset," then press the **Enter** button.

   **Note:** Both HD and SD Genlock are setup using the same steps.

### Vertical

1. Use the **Up** and **Down** buttons to move the cursor to "Vert," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the number of lines, then press the **Enter** button to save the selection.

   **Note:** The maximum amount of offset is determined by the format of the video set.
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Horizontal

1. Use the Up and Down buttons to move the cursor to "Horiz," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the number of pixels, then press the Enter button to save the selection.

Note: The maximum amount of offset is determined by the format of the video set.
General Information

Install Location: Any slot except 1-1 or 2-1.

I/O: Logic Input, Open-Collector, and Relay Contact

Description: This module is considered a global unit option. 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.

DTMF Tones

To setup the D9887B receiver to interpret a contact closure from a receiver (getting DTMF analog cue tones) and output an embedded SCTE-104 message in the SDI output, use the following steps:

1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "GPIO Module," then press the Enter button.
3. Use the Up and Down buttons to move the cursor to "Input 1," then press the Enter button.
4. Use the Up and Down buttons to select the message ("SCTE104 RDS1 1", "SCTE104 RDS1 2", "SCTE104 RDS1 3", "SCTE104 RDS1 4") that is to be inserted, then press the Enter button to save the selection.
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For example, SCTE104 RDS1 1 refers to splice request 1 that will be output on RDS1. In units with RDS2, the message options of "SCTE104 RDS2 1", "SCTE104 RDS2 2", "SCTE104 RDS2 3", "SCTE104 RDS2 4" are also available.

5 Use the Up and Down buttons to move the cursor to "Active State," then press Enter button.

6 Use the Up and Down buttons to select the state ("High" or "Low") in which the input will be considered active, then press the Enter button to save the selection.

Note: The aforementioned steps apply to the configuration of "Inputs 1-4, Outputs 1-3, and Relays 1-3" as well.

Splice Request Setup

Once the Input is setup, the outgoing SCTE-104 messages need to be configured. Use the following steps to configure the outgoing SCTE-104 messages:

1 Press the Menu button.

2 Use the Up and Down buttons to move the cursor to "Splice Requests," and then press the Enter button.

3 Use the Up and Down buttons to move the cursor to "Splice Req 1," and then press the Enter button.

Note: The following steps apply to Splice Req 1 - 4.

Note: The number "1-1" in the header "Splice Req 1-1" refers to the RDS and the Splice Request 1. The second Splice request will be numbered "1-2."
4 Use the **Up** and **Down**, and the **Left** and **Right** buttons to set the "AS Index" to the desired amount, and then press the **Enter** button. The "AS Index" ranges from 0 to 255 and uniquely identifies the source of the message. Enter the "AS Index" if one is present, otherwise leave blank (0).

5 Use the **Up** and **Down**, and the **Left** and **Right** buttons to set the "DPI PID Index" to the desired amount, and then press the **Enter** button. The "DPI PID Index" ranges from 0 to 65535 and is important when there are multiple DPI PIDs referenced by the PMT of one MPEG program. The user should take care to ensure the correct DPI PID and Video PID and PCR values (as indicated by the PMT) are configured on the D9887B receiver so that the splice points and decoded video are properly associated. Enter the "DPI PID Index" to specify the index to the DPI PID that will carry the splice_info_sections.

6 Use the **Up** and **Down**, and the **Left** and **Right** buttons to set the "Event Source Index" to the desired amount, and then press the **Enter** button.

7 For the "Splice Type:" choose ("OON", "OON Imm", "RTN", "RTN Imm", or "Cancel") using the **Up** and **Down** buttons, and then press the **Enter** button.

8 Use the **Up** and **Down**, and the **Left** and **Right** buttons to set the "Program ID" to the desired amount, and then press the **Enter** button. The "Program ID" ranges from 0 to 65535 and is a unique identification for a viewing event in the service.
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9 Use the Up and Down, and the Left and Right buttons to set the "Preroll" to the desired amount, and then press the Enter button. The "Pre-Roll" time is the desired amount of time, in milliseconds, after being processed that the action will occur.

10 Use the Up and Down, and the Left and Right buttons to set the "Break Duration" to the desired amount, and then press the Enter button. The "Break Duration" ranges from 0 65535. If the default, 0, is chosen the Injector will not set a duration. This value is ignored if "Splice Insert Type" is anything other than "Start Normal" or "Start Immediate." The "Break Duration" is entered in tenths of seconds.

11 Use the Up and Down, and the Left and Right buttons to set the "Avail Num" to the desired amount, and then press the Enter button. The "Avail Num" provides an authentication for a specific avail in the current "Unique Program ID." The "Avail Num" ranges from 0 to 255. If left at default, 0, non-usage will be assumed.

12 Use the Up and Down, and the Left and Right buttons to set the "Avail Expect" to the desired amount, and then press the Enter button. The "Avail Expect" specifies the number of individual Avails expected within the current viewing event. The "Avail Expect" ranges from 0 to 255. If left at its default, 0, "Avail Num" is assumed to have no meaning.

Note: The Web interface (see Using the Web Client to Configure the D9887B Receiver (on page 227)) uses the following names for the Splice Requests:

- "Splice Event Source" for "Event Source"
- "Unique Program ID" for "Program ID"
- "Pre-Roll Time" for "Preroll"
- "Avails Expected" for "Avail Expect"
- "Splice Insert Type" for "Splice Type", with values:
  - "Start Normal" for "OON"
  - "Start Immediate" for "OON Imm"
  - "End Normal" for "RTN"
  - "End Immediate" for "RTN Imm"

<table>
<thead>
<tr>
<th>Pinout</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
</tr>
<tr>
<td>2</td>
<td>Logic Input #1</td>
</tr>
<tr>
<td>3</td>
<td>Logic Input #2</td>
</tr>
<tr>
<td>4</td>
<td>Logic Input #3</td>
</tr>
<tr>
<td>5</td>
<td>Logic Input #4</td>
</tr>
<tr>
<td>6</td>
<td>+Vcc</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
</tr>
<tr>
<td>8</td>
<td>Open-Collector Output #1</td>
</tr>
<tr>
<td>9</td>
<td>GND</td>
</tr>
<tr>
<td>10</td>
<td>Open-Collector Output #2</td>
</tr>
<tr>
<td>11</td>
<td>GND</td>
</tr>
<tr>
<td>12</td>
<td>Open-Collector Output #3</td>
</tr>
<tr>
<td>13</td>
<td>Relay Contact #1</td>
</tr>
<tr>
<td>14</td>
<td>Relay Contact #1</td>
</tr>
<tr>
<td>15</td>
<td>Relay Contact #2</td>
</tr>
<tr>
<td>16</td>
<td>Relay Contact #2</td>
</tr>
<tr>
<td>17</td>
<td>Relay Contact #3</td>
</tr>
<tr>
<td>18</td>
<td>Relay Contact #3</td>
</tr>
</tbody>
</table>
Dual Input COFDM Receiver Option

General Information

Install Location: Any slot except 1-1 or 2-1.

I/O: (2) 75Ω Female F Connectors

Supported Formats: COFDM

Description: This card will allow the D9887B receiver to receive a COFDM signal for use in electronic news gathering (U.S.) or any COFDM Terrestrial Broadcast (DVB-T, European) applications. Only one input may be selected at a time.

To Edit the Option Card Input Settings

To edit this input card, use the following steps:

1. Press the Input button.
   
   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2. Use the Up and Down buttons to select "Input Modules," and press the Enter button.

3. Use the Up and Down buttons to move the cursor to the "Dual COFDM" card of the specific slot (e.g. 1-4). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

4. Press the Enter button once to display the Status screen for the COFDM card.

5. Press the Enter button again to display the Edit screen for the COFDM card.

Source

This option will select which input, on the back of the card, will be active.
1 Use the **Up** and **Down** buttons to move the cursor to "Source," then press the **Enter** button.

![Input A settings](image)

2 Use the **Up** and **Down** buttons to select which input to be active ("A", "B"), then press the **Enter** button to save the selection.

### Input A

These settings correspond to the input on "Source A."

#### Center Frequency A

The COFDM card tunes to the center frequency of the channel to tune to.

1 Use the **Up** and **Down** buttons to move the cursor to "Center Freq," then press the **Enter** button.

![Center Frequency A](image)

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the center frequency (49 MHz – 861 MHz), then press the **Enter** button to save the selection.

#### Channel Bandwidth A

1 Use the **Up** and **Down** buttons to move the cursor to "Channel BW," then press the **Enter** button.

![Channel Bandwidth A](image)

2 Use the **Up** and **Down** buttons to change the channel bandwidth ("6 MHz", "7 MHz", "8 MHz"), then press the **Enter** button to save the selection.
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Spectrum A

1. Use the Up and Down buttons to move the cursor to "Spectrum," then press the Enter button.

2. Use the Up and Down buttons to change the spectrum ("Normal", "Inverted"), then press the Enter button to save the selection.

Input B

These settings correspond to the input on "Source B."

Center Frequency B

The COFDM card tunes to the center frequency of the channel to tune to.

1. Use the Up and Down buttons to move the cursor to "Center Freq," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the center frequency (49 MHz – 861 MHz), then press the Enter button to save the selection.

Channel Bandwidth B

1. Use the Up and Down buttons to move the cursor to "Channel BW," then press the Enter button.

2. Use the Up and Down buttons to change the channel bandwidth ("6 MHz", "7 MHz", "8 MHz"), then press the Enter button to save the selection.
Spectrum B

1. Use the Up and Down buttons to move the cursor to "Spectrum," then press the Enter button.

2. Use the Up and Down buttons to change the spectrum ("Normal", "Inverted"), then press the Enter button to save the selection.
Quad Input DVB-S/DVB-S2 Receiver with LNB Option

General Information

Install Location: Any slot except 1-1 or 2-1.

I/O: (2) 75Ω Female F Connectors

Supported Formats: DVB-S/DVB-S2

Description: This input provides a satellite L-band (950 MHz – 2150 MHz) signal for demodulation of KU-band or C-band DVB-S QPSK signals or DVB-S2 QPSK/8PSK signals. The symbol rate ranges from 1 MSym/s to 45 MSym/s for both DVB-S and DVB-S2. This card provides LNB power and 22 kHz control tone to the active input. This card has advanced feature options of multistream input, support for VCM, and support for 16APSK and 32APSK modulation. 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, B, C and D inputs, which may be independently configured, but only one may be active at a time.

To Edit the Option Card Input Settings

To edit this input card, use the following steps:

1. Press the Input button.
2. Use the Up and Down buttons to select "Input Modules," and press the Enter button.
3. Use the Up and Down buttons to move the cursor to the "DVB-S/S2" card of the specific slot (e.g. 1-4). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.
4 Press the **Enter** button once to display the Status screen for the DVB-S/S2 card.
5 Press the **Enter** button again to display the Edit screen for the DVB-S/S2 card.

**Source**

This option will select which input, on the back of the card, will be active.

1 Use the **Up** and **Down** buttons to move the cursor to "Source Select," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select which input to be active ("A", "B", "C", "D"), then press the **Enter** button to save the selection.

**Source Settings**

These settings correspond to the "Source" input that is selected. Repeat these steps for each input source, "Source A", "Source B", "Source C", and "Source D."

The DVB-S/S2 card can receive either DVB-S or DVB-S2 transmission.

Use the **Up** and **Down** buttons to move the cursor to the Source ("Source A", "Source B", "Source C", "Source D") to edit the settings, then press the **Enter** button.

**DVB Mode**

The DVB-S/S2 card can receive either DVB-S or DVB-S2 transmission.

1 Use the **Up** and **Down** buttons to move the cursor to "DVB Mode," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select either ("DVBS", "DVBS2"), then press the **Enter** button to save the selection.
Enabling Advanced DVB-S2 Capabilities

The Quad Input DVB-S/DVB-S2 Receiver with LNB option card can support Multistream input, VCM, 16APSK, and 32APSK Modulation. These advanced capabilities are enabled with an "Advanced Satellite Features" license, see Feature Licensing (on page 226). The license is enabled by entering a License Key and the status of the License is noted in the License "Feature List." The license enables the "Advanced Satellite Features" capabilities for all Quad Input DVB-S/DVB-S2 Receiver with LNB option cards in the D9887B receiver.

When licensed, the "Multistream" settings will be available and the Quad Input DVB-S/DVB-S2 Receiver with LNB option card will be able to receive multistream transport streams, VCM, 16APSK and 32APSK modulation.

Multistream Mode

When "Multistream" is disabled (or not licensed), the Quad Input DVB-S/DVB-S2 Receiver with LNB option card will not be able to receive multistream inputs. The Quad Input DVB-S/DVB-S2 Receiver with LNB option will identify the input error as a multistream input.

1 Use the Up and Down buttons to move the cursor to "Multistream," then press the Enter button.

2 Use the Up and Down buttons to select either ("Off", "On"), then press the Enter button to save the selection.

ISI

Note: The setting of the "ISI" is only available when the "Multistream Mode" is set to "On."

1 Use the Up and Down buttons to move the cursor to "ISI Mode," then press the Enter button.

2 Use the Up and Down buttons to select either ("Manual", "List"), then press the Enter button to save the selection.

Available ISI

The selection of ISI values are from the ones available within the multistream input.
Use the **Up** and **Down** buttons to select an ISI that is available in the multistream input, then press the **Enter** button to save the selection.

![ISI selection](image)

**Manual ISI**

The ISI value is entered independent of the ISI values present in the input multistream. This is used when the Source is being configured without the source being the active input.

Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the ISI value (0 – 255), then press the **Enter** button to save the selection.

![ISI manual entry](image)

**LNB Power**

LNB power is configurable separately for each Source input, but is only supplied to the active source.

1. Use the **Up** and **Down** buttons to move the cursor to "LNB Power," then press the **Enter** button.

![LNB power selection](image)

2. Use the **Up** and **Down** buttons to select "Off", "13VDC", "14VDC", "18VDC", "19VDC", then press the **Enter** button to save the selection.

**22 kHz Tone**

22 kHz Tone is configurable separately for each Source input, but is only supplied to the active source. The 22 kHz Control Tone setting is either on or off.

**Note:** The 22 kHz Tone is only sent if the LNB power is supplied and the LNB Power is not set to "off."
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1 Use the Up and Down buttons to move the cursor to "22 kHz Tone," then press the Enter button.

2 Use the Up and Down buttons to select "Off", "13VDC", "14VDC", "18VDC", "19VDC", then press the Enter button to save the selection.

Tuning Frequency

The DVB-S/S2 card tunes by the L-band frequency rather than the transponder frequency or local oscillator value. The L-band frequency is the difference between the downlink transponder frequency "Sat Freq" and the LNB local oscillator frequency "LO Offset." The IRD will calculate the actual frequency in which the card tunes; saving the user time and possible miscalculation errors.

Local Oscillator Offset

The Local Oscillator Offset provides preset values that can be selected using the List mode. Any valid Local Oscillator Offset value can be entered using the Manual mode.

1 Use the Up and Down buttons to move the cursor to "LO Offset Mode," then press the Enter button.

2 Use the Up and Down buttons to select "Man" (for manual) or "List", then press the Enter button to save the selection.

3 When in "List" mode, use the Up and Down buttons to move the cursor to "LO Offset," then press the Enter button.

4 Use the Up and Down buttons to select "00000MHz", "05150MHz", "09750MHz", "10600MHz", "10750MHz" or "11250MHz" as the "LO Offset" setting, then press the Enter button to save the setting.
5 When in "Man" mode, use the Up and Down buttons to move the cursor to "LO Offset," then press the Enter button.

<table>
<thead>
<tr>
<th>DVB-S/S2</th>
<th>1-4</th>
<th>LO Offset: 00000 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sat Freq: 00950 MHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= L-Band: 00950 MHz</td>
</tr>
</tbody>
</table>

6 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Local Oscillator Offset (0 – 13550 MHz), then press the Enter button to save the selection.

Note: If a value is entered results in a calculated L-Band that is out of range, an "Out of Range!" message will be shown.

Note: The L-Band calculation is shown after the "Sat Freq" line. The valid L-Band frequency range is 950 – 2150 MHz.

Satellite Frequency

1 Use the Up and Down buttons to move the cursor to "Sat Freq," then press the Enter button.

<table>
<thead>
<tr>
<th>DVB-S/S2</th>
<th>1-4</th>
<th>LO Offset: 00000 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sat Freq: 00950 MHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= L-Band: 00950 MHz</td>
</tr>
</tbody>
</table>

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the frequency (950 MHz – 14500 MHz), then press the Enter button to save the selection.

Note: If a value entered results in a calculated L-Band that is out of range, an "Out of Range!" message will be shown.

Note: The L-Band calculation is shown after the "Sat Freq" line. The valid L-Band frequency range is 950 – 2150 MHz.

Symbol Rate

1 Use the Up and Down buttons to move the cursor to "Sym Rt," then press the Enter button.

<table>
<thead>
<tr>
<th>DVB-S/S2</th>
<th>1-4</th>
<th>LO Offset: 00000 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sat Freq: 00950 MHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= L-Band: 00950 MHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sym Rt: 27.000000MSps</td>
</tr>
</tbody>
</table>

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the symbol rate (1 MSp – 45 MSp).

3 Press the Enter button to save the selection.
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CA Decryption Option

General Information

Install Location: Factory Installed Option (Not Field Upgradeable)

I/O: Two external slots in the front of the unit. The transport stream is input and output through the various other option cards.

Description: The D9887B receiver can be configured with this option to be able to decrypt a Conditional Access transport stream. In Config 1, the dual CAM functionality can be used to decrypt multiple services to send out ASI, essentially looping the stream through the D9887B receiver for decryption.

This option also provides BISS decryption.

Note: The dual CAM functionality is only available in a Config 1 when the "CAM Operation Mode" is set to "Use Decoded Stream." In Config 2, each slot links to its respective RDS.

CAM Decryption Setup

To setup the D9887B receiver to decrypt Conditional Access Streams, use the following steps.

1. Press the Home button to bring the display back to the RDS status screen.

   ![RDS 1 menu]

   - Source ID
   - BISS Decryption
   - CA Systems

2. Press the Left button to access the RDS 1 Decoder Menu.

   Note: For Configuration 2 units, all of the following instructions apply exactly the same except, use the Right button to access the RDS 2 Decoder Menu.

3. Use the Up and Down buttons to move the cursor to "CA Systems," then press the Enter button to display the CAM status.

4. Press the Enter button again to edit the CAM settings.

   ![CA Systems menu]

   - Desramble: Enabled
   - CAM Operation Mode: Use Decoded PIDs

RDS CAM Usage Setting

The PIDs are sent to the CA System whenever it is enabled. When disabled, the PIDs are not sent to the CA System for decryption.
1 Use the **Up** and **Down** buttons to move the cursor to "Descramble," then press the **Enter** button.

```
↓↑ CA Systems RDS1 ←
Descrambler: Enabled
CAM Operation Mode:
Use Decoded PIDs
```

2 Use the **Up** and **Down** buttons to change the setting ("Enabled" or "Disabled"), then press the **Enter** button to save the selection.

**Setting the CAM Operation Mode**

1 Use the **Up** and **Down** buttons to move the cursor to "CAM Operation Mode," then press the **Enter** button.

```
↓↑ CA Systems RDS1 ←
CAM Operation Mode:
Use Decoded PIDs
CAM2: NagraVision
```

2 Use the **Up** and **Down** buttons to change the mode ("Use Decoded PIDs" or "Use Selected PIDs"), then press the **Enter** button to save the selection.

**Note:** Depending on the mode selection, the menus below the mode options will have changed.

**Use Decoded PIDs**

In the "Use Decoded PIDs" operation mode, the CAM will decrypt the audio and video programs that are decoded by the D9887B receiver. The Service Selection tuning determines the program that is sent to the CAM for decrypting before the decoding takes place. Only the program used for decoding is sent to the CAM no matter how many programs the CAM is capable of decrypting. If programs other than (or in addition to) the one being decoded is to be sent to the CAM for decryption, the "Use Selected PIDs" mode should be used.

**Use Selected PIDs**

The "Use Selected PIDs" operation mode allows the selection of individual video and audio PIDs to send to the CAM for decryption. There is no restriction on which PIDs can be selected (audio and video PIDs need not be in the same program). The PIDs are selected from the PIDs that are available in the PMT of the input. If there is no input PMT available, the selection of PIDs will not be possible. If a selected PID is no longer listed in the input PMT, the Service that contained the PID will be listed followed by a *men* indication. The Services with PIDs that are no longer in the PMT can be found on the bottom of the Service list.

Once "CAM Operation Mode" has been set to "Use Selected PIDs," use the following steps to configure your D9887B receiver to decrypt selected PIDs.
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**Note:** It is only possible to decrypt more than one program at a time, if the CAM module supports multiple program decrypting.

1 The Services that are sent to the CAMs are listed under the "CAM1" or "CAM2" (with the CAM name if available).

![CAM Options](image1)

2 Use the **Up** and **Down** buttons to move the cursor to the program (Service) which contains the PIDs to be selected, then press the **Enter** button.

![CAM Options](image2)

3 The video and audio PIDs that are available for that Service in the PMT are listed.

4 Use the **Up** and **Down** buttons to move the cursor to the PID to be selected or deselected, then press the **Enter** button.

5 Press the **Enter** button to edit the selection.

![CAM Options](image3)

6 Use the **Up** and **Down** buttons to change the selection status.

7 Press the **Enter** button to save the selection.

**Note:** The short name is listed (if available) with the Service. The PIDs video type and audio language information is shown along with the PID.

**Note:** The symbol "♦" denotes that the PID is a selected PID (being sent to the CAM). The symbol "◊" denotes that the PID is not selected (not being sent to the CAM).

**PIDs No Longer in the Input PMT**

The selected PIDs that are not listed in the PMT are listed followed with a "*" under the associated CAM. The list contains the Services, with PID selection available after selecting the Service. These PIDs can be selected or deselected. If they remain selected and appear in the PMT, those PIDs will be sent to the CAM for decryption.
1 Use the Left and Right buttons to move the cursor to a "*"ed Service, then press the Enter button.

```
↓↑ CA Systems RDS1 ↓
SVC:816 ABCHE
SVC:892 CBCMH
◼ SVC:1030 CBCMB *
```

2 Use the Up and Down buttons to move the cursor to the PID to be selected or deselected, then press the Enter button.

```
↓↑ CA Systems RDS1 ↓
SVC:1030 CBCMB *
◆x1111 MPEG2 Video
◻x1114 ATSC AC3
```

3 Use the Up and Down buttons to change the selection status.

4 Press the Enter button to save the selection.

5 The display will return to the PID selection list (Step 3) with the correct "◆" or "◊."

```
↓↑ CA Systems RDS1 ↓
SVC:1030 CBCMB *
◆x1111 MPEG2 Video
◻x1114 ATSC AC3
```

Note: When the Service no longer has PIDs that are not in the PMT, it will not be listed as a "*"ed Service.

**BISS Setup**

To setup the D9887B receiver to be able to decrypt a BISS encrypted transport stream use the following steps:

1 Press the Home button to bring the display back to the RDS status screen.
2 Press the Left button to access the RDS 1 Decoder Menu.
3 Use the Up and Down buttons to move the cursor to "BISS Decryption," then press the Enter button.

```
↓↑ RDS 1 ---↓
Audio 2 Setup
Source ID
◻BISS Decryption
```

4 Press the Enter button again to edit the Source ID settings.

Note: For Configuration 2 units, all of the following instructions apply exactly the same except, use the Right button to access the RDS 2 Decoder Menu.
5 Use the **Up** and **Down** buttons to move the cursor to "Mode," then press the **Enter** button.

![Mode: BISS RDS 1](image)

6 Use the **Up** and **Down** buttons to change the mode ("BISS 1" or "BISS E"), then press the **Enter** button to save the selection.

**Note:** Depending on the mode selection, the menus below the mode options will have changed.

**Mode BISS 1**

Once the D9887B receiver has been set to use Mode 1, use the following steps to enter the session word:

1 Use the **Up** and **Down** buttons to move the cursor to "Session Word," then press the **Enter** button.

![Session Word: 0x000000000000](image)

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to enter the session word, then press the **Enter** button to save the selection.

**Mode BISS E**

Once the D9887B receiver has been set to use Mode E, use the steps below to enter the "Encrypted Session Word" and "Injected ID."

1 Use the **Up** and **Down** buttons to move the cursor to "Encrypt Session Word," then press the **Enter** button.

![Encrypt Session Word: 0x000000000000](image)

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to enter the encrypted session word, then press the **Enter** button to save the selection.
3 Use the **Up** and **Down** buttons to move the cursor to "Injected ID," then press the **Enter** button.

```
<Diagram showing cursor options: BISS RDS I, Encrypt Session Word, Injected ID, 0x0000000000000000>
```

4 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to enter the injected ID, then press the **Enter** button to save the selection.
MPEG over IP Input/Output Option

General Information

Install Location: Installs in 1-3, 4 or 2-3, 4 Only (Uses two slots)

Only one 8725 can be installed per D9887B receiver chassis.

I/O: (1) 10/100/1000 Auto-negotiating Base-T RJ-45 Ethernet Port, (1) SFP Port

Supported Formats: UDP or RTP Multicasts and Unicasts

Description: This card encapsulates the TS from the bus and will transmit IP streams, which are present on the bus, to either ASI/310M or to a decoder. 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.

Menu Control

This menu is used to setup the IP address, Subnet Mask, and Gateway for the MPEG/IP card. These settings need to be set to proper values for the network that the D9887B receiver is being used on. These values can usually be obtained from the local network administrator.

1. Press the Menu button.

2. Use the Up and Down buttons to move the cursor to "MPEG/IP NetCfg," then press the Enter button.

IP Address/Subnet Mask/Gateway

1. Use the Up and Down buttons to move the cursor to "IP Address," then press the Enter button.
2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP, then press the Enter button to save the selection.

3 The cursor will now be on "Subnet Mask."

<table>
<thead>
<tr>
<th>MPEG/IP 1-3 Net--J</th>
<th>10.0.0.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subnet Mask</td>
<td>255.255.255.000</td>
</tr>
</tbody>
</table>

4 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Subnet Mask, then press the Enter button to save the selection.

5 The cursor will now be on "Gateway."

<table>
<thead>
<tr>
<th>MPEG/IP 1-3 Net--J</th>
<th>255.255.255.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway</td>
<td>000.000.000.000</td>
</tr>
</tbody>
</table>

6 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Gateway, then press the Enter button to save the selection.

**MAC Address**

This option will show the physical MAC Address of the MPEG/IP card.

Use the Up and Down buttons to move the cursor to "MAC Address" to view the MPEG/IP card’s physical MAC Address.

<table>
<thead>
<tr>
<th>MPEG/IP 1-3 Net</th>
<th>0.0.0.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC Address</td>
<td>00012ABCD123</td>
</tr>
</tbody>
</table>

**To Edit the Option Card Input Settings**

To edit this input card, use the following steps:

1 Press the Input button.

   **Note:** For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2 Use the Up and Down buttons to select "Input Modules," and press the Enter button.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

3  Use the Up and Down buttons to move the cursor to the "MPEG/IP" card of the specific slot (e.g. 1-3). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

4  Press the Enter button once to display the Status screen for the MPEG/IP card.

5  Press the Enter button again to display the Edit screen for the MPEG/IP card.

Receive

This option enables or disables the receive function of the MPEG/IP card.

1  Use the Up and Down buttons to move the cursor to "Receive," then press the Enter button.

2  Use the Up and Down buttons to "Enable" or "Disable," then press the Enter button to save the selection.

Group to Receive

The D9887B receiver allows the user to subscribe to two multicasts simultaneously in order to provide a backup in the case of a primary failure. There are three options for the Receive Group (1, 2, Auto). Auto will attempt to join the first multicast, if it cannot join, it will then attempt to join the second one. If the unit is currently joined to the first multicast and that stream disappears, the unit will automatically switch over to the second receive group. The only time the unit will go back to the first receive group, is if it is forced back or if the second receive group disappears.

This backup of the Receive Group has additional settings (which are only present when the Group to Receive is set to "Auto"). The "Auto" options provide a timeout before switching between the Receive Groups.

If the "Group To Recv" is set to either 1 or 2, the unit will always stay on that receive group regardless of whether it is present or not.
1 Use the **Up** and **Down** buttons to move the cursor to "Grp To Recv," then press the **Enter** button.

![MPEG/IP 1-3](image)

2 Use the **Up** and **Down** buttons to select the desired group to receive ("1", "2", "Auto"), then press the **Enter** button to save the selection.

3 Use the **Up** and **Down** buttons to move the cursor to "Auto Timeout," then press the **Enter** button.

![MPEG/IP 1-3](image)

4 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the timeout setting (5 – 999 seconds), then press the **Enter** button to save the selection.

### Receive 1

Use the **Up** and **Down** buttons to move the cursor to "Receive 1," then press the **Enter** button to access the Edit screen.

![MPEG/IP 1-3](image)

### IP

1 Use the **Up** and **Down** buttons to move the cursor to "IP," then press the **Enter** button.

![MPEG/IP 1-3](image)

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the IP, then press the **Enter** button to save the selection.

**Note:** A Unicast or Multicast IP address may be chosen.

Unicast: X.X.X.X – 223.255.255.255
Multicast: 224.0.0.0 – 239.255.255.255
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Suggested Multicast Range: 239.192.X.X

**Destination Port**
1. Use the **Up** and **Down** buttons to move the cursor to "Dest Port," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the port (0 – 65536), then press the **Enter** button to save the selection.

**Send IGMP Report**
This option will send an unsolicited IGMP report to force a join operation.
1. Use the **Up** and **Down** buttons to move the cursor to "Send IGMP Report," then press the **Enter** button.

2. Press the **Enter** button one more time to send the report.

**IGMP V3 Source Filter**
Use the **Up** and **Down** buttons to move the cursor to "IGMP V3 Src Filter," then press the **Enter** button to access the Edit screen.

**Filter Mode**
1. Use the **Up** and **Down** buttons to move the cursor to "Filter Mode," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select either "Include" or "Exclude," then press the **Enter** button to save the selection.
Add IP

1. Use the Up and Down buttons to move the cursor to "Add IP," then press the Enter button.

2. Press the Enter button again to add an IP address to the list.
   **Note:** Existing IP addresses are shown before the "Add IP" option.

3. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP address, then press the Enter button to save the selection.

   **Note:** A maximum of 64 IP addresses may be added to the list.

Edit/Remove an IP

**Note:** Existing IP addresses are shown before the "Add IP" option.

1. Use the Up and Down buttons to move the cursor to the desired IP address to edit, then press the Enter button.

2. Use the Left and Right buttons to select either "Edit" or "Remove," then press the Enter button

Clear All

This option will clear all IP addresses in the filter list.

1. Use the Up and Down buttons to move the cursor to "Clear All," then press the Enter button.

2. Press the Enter button one more time to clear all the IP addresses in the list.
Chapter 4 Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Receive 2

Use the **Up** and **Down** buttons to move the cursor to "Receive 2," then press the **Enter** button to access the Edit screen.

![MPEG/IP 1-3](image)

**IP**

1. Use the **Up** and **Down** buttons to move the cursor to "IP," then press the **Enter** button.

![MPEG/IP 1-3](image)

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the IP, then press the **Enter** button to save the selection.

**Note:** A Unicast or Multicast IP address may be chosen.

Unicast: X.X.X.X – 223.255.255.255
Multicast: 224.0.0.0 – 239.255.255.255
Suggested Multicast Range: 239.192.X.X

**Destination Port**

1. Use the **Up** and **Down** buttons to move the cursor to "Dest Port," then press the **Enter** button.

![MPEG/IP 1-3](image)

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the port (0 – 65536), then press the **Enter** button to save the selection.
Send IGMP Report

This option will send an unsolicited IGMP report to force a join operation.

1. Use the Up and Down buttons to move the cursor to "Send IGMP Report," then press the Enter button.

   
   ![MPEG/IP 1-3 2]
   Ip: 239.192.1.50
   Dest Port: 01050
   ➤Send IGMP Report

2. Press the Enter button one more time to send the report.

IGMP V3 Source Filter

Use the Up and Down buttons to move the cursor to "IGMP V3 Src Filter," then press the Enter button to access the Edit screen.

   
   ![MPEG/IP 1-3 2]
   Dest Port: 01050
   ➤Send IGMP Report
   ➤IGMP V3 Src Filter

Filter Mode

1. Use the Up and Down buttons to move the cursor to "Filter Mode," then press the Enter button.

   
   ![MPEG/IP 1-3 2]
   ➤Filter Mode: Include
   Add IP
   Clear All

2. Use the Up and Down buttons to select either "Include" or "Exclude," then press the Enter button to save the selection.

Add IP

1. Use the Up and Down buttons to move the cursor to "Add IP," then press the Enter button.

   
   ![MPEG/IP 1-3 2]
   ➤Filter Mode: Include
   Add IP
   Clear All

2. Press the Enter button again to add an IP address to the list.

Note: Existing IP addresses are shown before the "Add IP" option.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

3 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP address, then press the Enter button to save the selection.

Note: A maximum of 64 IP addresses may be added to the list.

Edit/Remove an IP

Note: Existing IP addresses are shown before the "Add IP" option.

1 Use the Up and Down buttons to move the cursor to the desired IP address to edit, then press the Enter button.

2 Use the Left and Right buttons to select either "Edit" or "Remove," then press the Enter button.

Clear All

This option will clear all IP addresses in the filter list.

1 Use the Up and Down buttons to move the cursor to "Clear All," then press the Enter button.

2 Press the Enter button one more time to clear all the IP addresses in the list.
Forward Error Correction

This setting lets the decoder know if it should be expecting FEC data with the active receive group. If no FEC data is expected, this setting can be disabled to allow multicasts closer together on the same IP.

1. Use the Up and Down buttons to move the cursor to "FEC," then press the Enter button.

2. Use the Up and Down buttons to either "Enable" or "Disable" the setting, then press the Enter button to save the selection.

Jitter Tolerance

This setting is used to set the number of IP packets that the unit needs to receive before starting to decode video. Most closed networks should use a setting of Low or Medium unless the network is especially prone to severe jitter.

1. Use the Up and Down buttons to move the cursor to "Jitter Tol," then press the Enter button.

2. Use the Up and Down buttons to set the desired jitter tolerance mode ("Low", "Med", "High"), then press the Enter button to save the selection.

Buffer

1. Use the Up and Down buttons to move the cursor to "Buffer Size," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Buffer (from 10 ms to 600 ms), then press the Enter button to save the selection.
Null Stripped

This setting is used to allow the D9887B receiver to receive a null stripped IP stream.

1. Use the Up and Down buttons to move the cursor to "Null Strip," then press the Enter button.

2. Use the Up and Down buttons to enable or disable null stripping, then press the Enter button to save the selection.

Reset Counters

This option will reset the counters on the status screen for the MPEG/IP card.

1. Use the Up and Down buttons to move the cursor to "Reset Counters," then press the Enter button.

2. Press the Enter button again to reset the counters.

Output Control

To configure this card as an output, use the following steps:

1. Press the Output button.
   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2. Use the Up and Down buttons to move the cursor to the "MPEG/IP" card of the specific slot (e.g. 1-3). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

3. Press the Enter button once to display the Status screen for the MPEG/IP card.

4. Press the Enter button again to display the Edit screen for the MPEG/IP card.
Transmit 1

1. Use the Up and Down buttons to move the cursor to "Transmit 1," then press the Enter button. This displays the status screen.

   ![MPEG/IP 1-3]
   
   ► Transmit 1  
   ► Transmit 2  
   ► Transmit 3

2. Press the Enter button one more time to get to the Edit screen.

3. Use the Up and Down buttons to move the cursor to "Transmit," then press the Enter button.

   ![MPEG/IP 1-3]
   
   ► Transmit:Enabled  
   ► IP:239.192.0.1  
   ► Dest Port:01030

4. Use the Up and Down buttons to set Transmit 1 to "Enabled" or "Disabled," then press the Enter button to save the selection.

IP

1. Use the Up and Down buttons to move the cursor to "IP," then press the Enter button.

   ![MPEG/IP 1-3]
   
   ► Transmit:Enabled  
   ► IP:239.192.000.001  
   ► Dest Port:01030

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP, then press the Enter button to save the selection.

Destination Port

1. Use the Up and Down buttons to move the cursor to "Dest Port," then press the Enter button.

   ![MPEG/IP 1-3]
   
   ► Transmit:Enabled  
   ► IP:239.192.0.1  
   ► Dest Port:01030

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the destination port (1025 – 65536), then press the Enter button to save the selection.
Chapter 4 Using the Front Panel to Configure the D9887B HDTV Modular Receiver

RTP
1. Use the Up and Down buttons to move the cursor to "RTP," then press the Enter button.

![MPEG/IP 1-3](image)

IP:239.192.0.1
Dest Port:01030
RTP:Enabled

2. Use the Up and Down buttons to "Enable" or "Disable" RTP, then press the Enter button to save the selection.

Transmit 2
1. Use the Up and Down buttons to move the cursor to "Transmit 1," then press the Enter button. This displays the status screen.

2. Press the Enter button one more time to get to the Edit screen.

3. Use the Up and Down buttons to move the cursor to "Transmit," then press the Enter button.

![MPEG/IP 1-3](image)

Transmit 1
Transmit 2
Transmit 3

4. Use the Up and Down buttons to set Transmit 1 to "Enabled" or "Disabled," then press the Enter button to save the selection.

![MPEG/IP 1-3](image)

Transmit:Enabled
IP:239.192.0.1
Dest Port:01030

IP
1. Use the Up and Down buttons to move the cursor to "IP," then press the Enter button.

![MPEG/IP 1-3](image)

Transmit:Enabled
IP:239.192.000.001
Dest Port:01030

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP, then press the Enter button to save the selection.
Destination Port
1 Use the Up and Down buttons to move the cursor to "Dest Port," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the destination port (1025 – 65536), then press the Enter button to save the selection.

RTP
1 Use the Up and Down buttons to move the cursor to "RTP," then press the Enter button.

2 Use the Up and Down buttons to "Enable" or "Disable" RTP, then press the Enter button to save the selection.

Transmit 3
1 Use the Up and Down buttons to move the cursor to "Transmit 1," then press the Enter button. This displays the status screen.

2 Press the Enter button one more time to get to the Edit screen.
3 Use the Up and Down buttons to move the cursor to "Transmit," then press the Enter button.
4 Use the Up and Down buttons to set Transmit 1 to "Enabled" or "Disabled," then press the Enter button to save the selection.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

IP

1  Use the **Up** and **Down** buttons to move the cursor to "IP," then press the **Enter** button.

   ![MPEG/IP 1-3](image)

   Transmit:Enabled
   IP:239.192.000.001
   Dest Port:01030

2  Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the IP, then press the **Enter** button to save the selection.

Destination Port

1  Use the **Up** and **Down** buttons to move the cursor to "Dest Port," then press the **Enter** button.

   ![MPEG/IP 1-3](image)

   Transmit:Enabled
   IP:239.192.0.1
   Dest Port:01030

2  Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the destination port (1025 – 65536), then press the **Enter** button to save the selection.

RTP

1  Use the **Up** and **Down** buttons to move the cursor to "RTP," then press the **Enter** button.

   ![MPEG/IP 1-3](image)

   IP:239.192.0.1
   Dest Port:01030
   RTP:Enabled

2  Use the **Up** and **Down** buttons to "Enable" or "Disable" RTP, then press the **Enter** button to save the selection.

Global Transmit Settings

Use the **Up** and **Down** buttons to move the cursor to "Global Settings," then press the **Enter** button.

   ![MPEG/IP 1-3](image)

   Transmit 2
   Transmit 3
   Global Settings
Forward Error Correction

1. Use the **Up** and **Down** buttons to move the cursor to "FEC," then press the **Enter** button.

```
  Up MPEG/IP 1-3      Down
  ►FEC:Off            FTP
    RSRC Setup:Auto
```

2. Use the **Up** and **Down** buttons to select the desired FEC type ("Off", "Col & Row", "Col only"), then press the **Enter** button to save the selection.

Rows(D) and Columns(L)

**Note:** These settings will only be available if FEC is set to either Col & Row or Col only, in the above steps.

1. Use the **Up** and **Down** buttons to move the cursor to "Rows(D)," then press the **Enter** button.

```
  Up MPEG/IP 1-3      Down
    FEC:Col & Row     Rows(D):004
                      Columns(L):001
```

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the rows value (from 4 to 20), then press the **Enter** button to save the selection.

**Note:** After modifying the Rows(D), the unit moves the cursor to the Columns(L) field for editing. The Columns(D) can be edited without changing the Rows(D) entry.

3. Use the **Up** and **Down** buttons to move the cursor to "Columns(L)," then press the **Enter** button.

```
  Up MPEG/IP 1-3      Down
    FEC:Col & Row     Rows(D):004
                      Columns(L):001
```

4. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the columns value (from 1 to 20), then press the **Enter** button to save the selection.

**Note:** The Rows(D) and Columns(L) fields have the following restriction – Columns(D) * Rows(D) < 100. If ≥ 100, the Rows(D) field is reduced.

**Note:** To enter "20", first set the tens digit to "1" ("01x"), then set the ones digit to "0" ("010"), and finally increase the tens digit to read "020."
Chapter 4 Using the Front Panel to Configure the D9887B HDTV Modular Receiver

**Synchronization Source Setup Type**

1. Use the **Up** and **Down** buttons to move the cursor to "SSRC Setup," then press the **Enter** button.

   ![SSRC Setup Menu]

2. Use the **Up** and **Down** buttons to select the desired type of SSRC Setup ("Auto", "User"), then press the **Enter** button to save the selection.

**Synchronization Source Setup**

*Note:* The Synchronization Source is used to further distinguish RTP sources that use the same IP and port.

*Note:* This option will only be available if the SSRC SETUP is set to "User."

1. Use the **Up** and **Down** buttons to move the cursor to "SSRC," then press the **Enter** button.

   ![SSRC Menu]

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the SSRC, then press the **Enter** button to save the selection.

**Differentiated Services**

1. Use the **Up** and **Down** buttons to move the cursor to "DiffServ," then press the **Enter** button.

   ![DiffServ Menu]

2. Use the **Up** and **Down** buttons to select the desired differentiated services ("Default", "AF11", "AF12", "AF13", "AF21", "AF22", "AF23", "AF31", "AF32", "AF33", "AF41", "AF42", "AF43", "EF"), then press the **Enter** button to save the selection.
**Source Port**

1. Use the Up and Down buttons to move the cursor to "Src Port," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the port (0 – 65536), then press the Enter button to save the selection.

**IP Packets / MPEG Frame**

This setting defines how many IP packets will be transmitted per MPEG frame.

1. Use the Up and Down buttons to move the cursor to "Packets/Frame," then press the Enter button.

2. Use the Up and Down buttons to specify the number of IP packets to be transmitted per MPEG frame (1-7), then press the Enter button to save the selection.
Dual MPEG over IP Input/ UDP Output Option

General Information

**Install Location:** Installs in 1–2 through 1–4 and/or 2–2 through 2–4.

**I/O:** (2) 10/100/1000 Auto-negotiating Base-T RJ-45 Ethernet Port

**Supported Formats:** Receive UDP or RTP Multicasts and Unicasts. Transmit: UDP only

**Description:** This card encapsulates the TS from the bus and will transmit IP streams. It can also take in IP streams and place them on the bus for an ASI/310M card and/or a decoder. Up to two multicasts can be subscribed to, allowing for a backup multicast to be chosen and two mirrored unicast can be transmitted to allow for redundancy. The two physical connectors can be configured independently.

Menu Control

This menu is used to setup the IP address, Subnet Mask, and Gateway for the MPEG/IP card. These settings need to be set to proper values for the network that the D9887B receiver is being used on. These values can usually be obtained from the local network administrator.

1. Press the **Menu** button.

2. Use the **Up** and **Down** buttons to move the cursor to "MPEG/IP NetCfg," then press the **Enter** button.

3. Select "Port 1" or "Port 2," and then press the **Enter** button.
IP Address/Subnet Mask/Gateway
1 Use the Up and Down buttons to move the cursor to "IP Address," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP, then press the Enter button to save the selection.

3 The cursor will now be on "Subnet Mask."

4 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Subnet Mask, then press the Enter button to save the selection.

5 The cursor will now be on "Gateway."

6 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Gateway, then press the Enter button to save the selection.

MAC Address
This option will show the physical MAC Address of the MPEG/IP card.

Use the Up and Down buttons to move the cursor to "MAC Address" to view the MPEG/IP card’s physical MAC Address.
To Edit the Option Card Input Settings

To edit this input card, use the following steps:

1. Press the **Input** button.
   
   **Note:** For Configuration 2 units, select RDS1 or RDS2, then press **Enter**.

2. Use the **Up** and **Down** buttons to select "Input Modules," and press the **Enter** button.

3. Use the **Up** and **Down** buttons to move the cursor to the "MPEG/IP" card of the specific slot (e.g. 1-4). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

4. Press the **Enter** button once to display the Status screen for the MPEG/IP card.

5. Press the **Enter** button again to display the Edit screen for the MPEG/IP card.

Group Selection Settings

This section allows the user to specify which Receive Group is active (Receive 1 or Receive 2), if one of the receive groups acts as a backup for the other receive group (setting the "Active Group" to "Auto") and then setting the backup options.

The backup options assign a primary receive group, what is used to trigger the switchover to the backup receive group, when the Primary should be restored and the timeout before switching to the Backup or restoring to the Primary.

The D9887B receiver is usually configured to have either the MPEG/IP backup enabled or the Input Option backup enabled, not both.

Selecting the Active Receive Group

1. Use the **Up** and **Down** buttons to move the cursor to "Active Group," then press the **Enter** button.
2 Use the Up and Down buttons to select "1", "2", or "Auto," then press the Enter button to save the selection.

**Note:** Using "Auto" will enable the backup functionality.

**Note:** When the backup functionality is being used, the user can choose which Receive Group is being used as follows: setting the "Pri Group" to the desired group or by setting the "Active Group" to the desired group, and then activating the backup functionality again by setting the "Active Group" to "Auto."

**Setting the Primary Receive Group**

**Note:** The Receive Group that is not selected as the Primary Receive Group, will be the Backup Receive Group.

1 Use the Up and Down buttons to move the cursor to "Pri Group," then press the Enter button.

```
MPEG/IP 1-4
Active Group: Auto
Pri Group: 1
Switchover: TrigTsErr
```

2 Use the Up and Down buttons to select "1" or "2," then press the Enter button to save the selection.

**Setting the Switchover Trigger**

This sets the failure that is used to initiate a switchover to the backup. It is either a failure of the Receive Group reception ("TrigTsErr") that is detected by a lack of TS Presence in the Receive Group, or when the video cannot be decoded ("TrigDecErr").

When "TrigDecErr" is used, the "Pri Rest" (Primary Restore) will be set to "Never" and the "Pri Rest" option is not presented. This is done because the Primary restore uses the TS Presence ("TrigTsErr") to detect when the primary is present, and unstable operation could take place if the switchover triggers are not consistent.

1 Use the Up and Down buttons to move the cursor to "Switchover," then press the Enter button.

```
MPEG/IP 1-4
Active Group: 1
Pri Group: 1
Switchover: TrigTsErr
```

2 Use the Up and Down buttons to select "TrigTsErr" or "TrigDecErr," then press the Enter button to save the selection.

**Note:** Using "TrigDecErr" sets "Pri Rest" to "Never" and it does not need to be changed.
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Setting when to Restore to the Primary

Note: This is not changeable when using "TrigDecErr" ("Pri Rest" is set to "Never" in this case).

1  Use the Up and Down buttons to move the cursor to "Pri Rest," then press the Enter button.

2  Use the Up and Down buttons to select "Never", "WhnPriRet" (When the Primary Returns), or "OnBkpFail" (On Backup Failure), then press the Enter button to save the selection.

Setting the Switchover Timeout

The Switchover Timeout is the delay between the detection of the failure and the switch to either the backup or back to the primary (controlled by the Restore to Primary setting) receive group.

1  Use the Up and Down buttons to move the cursor to "Timeout," then press the Enter button.

2  Use the Up and Down buttons to select the time in seconds (from 0 to 10 seconds in 0.5 second intervals), then press the Enter button to save the selection.

Receive 1

This section allows the user to setup the receive function of the first receive group.

1  Use the Up and Down buttons to move the cursor to "Receive 1," then press the Enter button.
2 Use the **Up** and **Down** buttons to move the cursor to "Receive," then press the **Enter** button.

<table>
<thead>
<tr>
<th>MPEG/IP</th>
<th>1-4</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive:Enable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phys Conn:Port 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ip: 239.192.0.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 Use the **Up** and **Down** buttons to "Enable" or "Disable" Receive 1, then press the **Enter** button to save the selection.

4 Use the **Up** and **Down** buttons to move the cursor to "Phys Conn," then press the **Enter** button.

<table>
<thead>
<tr>
<th>MPEG/IP</th>
<th>1-4</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive:Enable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phys Conn:Port 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ip: 239.192.0.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5 Choose the physical connector using the **Up** and **Down** buttons ("Port 1" or "Port 2"), then press the **Enter** button.

**IP**

1 Use the **Up** and **Down** buttons to move the cursor to "IP," then press the **Enter** button.

<table>
<thead>
<tr>
<th>MPEG/IP</th>
<th>1-4</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ip: 239.192.0.01.050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dest Port: 01050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEC: Disable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the IP, then press the **Enter** button to save the selection.

**Note:** A Unicast or Multicast IP address may be chosen.

- Unicast: X.X.X.X – 223.255.255.255
- Multicast: 224.0.0.0 – 239.255.255.255
- Suggested Multicast Range: 239.192.X.X

**Destination Port**

1 Use the **Up** and **Down** buttons to move the cursor to "Dest Port," then press the **Enter** button.

<table>
<thead>
<tr>
<th>MPEG/IP</th>
<th>1-4</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ip: 239.192.1.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dest Port: 01050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEC: Disable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

2  Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the port (0 – 65536), then press the **Enter** button to save the selection.

**Forward Error Correction**

This setting lets the decoder know if it should be expecting FEC data with the active receive group. If no FEC data is expected, this setting can be disabled to allow multicasts closer together on the same IP.

1  Use the **Up** and **Down** buttons to move the cursor to "FEC," then press the **Enter** button.

```
\[ MPEG/IP 1-4 1 .J
Ip:239.192.1.50
Dest Port:01050
\]\]FEC:Disable
```

2  Use the **Up** and **Down** buttons to select "Enable" or "Disable," then press the **Enter** button to save the selection.

**Synchronized Source Setup**

1  Use the **Up** and **Down** buttons to move the cursor to "SSRC," then press the **Enter** button.

```
\[ MPEG/IP 1-4 1 .J
FEC:Disable
\]\]SSRC:Disable
\]\]SSRC Filt:0x00000000
```

2  Use the **Up** and **Down** buttons to select "Enable" or "Disable," then press the **Enter** button to save the selection.

**Synchronized Source Setup Filter**

1  Use the **Up** and **Down** buttons to move the cursor to "SSRC Filt," then press the **Enter** button.

```
\[ MPEG/IP 1-4 1 .J
FEC:Disable
\]\]SSRC:Disable
\]\]SSRC Filt:0x00000000
```

2  Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the SSRC Filter, then press the **Enter** button to save the selection.
Buffer
1 Use the **Up** and **Down** buttons to move the cursor to "Buffer," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the Buffer (from 3999 kb to 100 kb), then press the **Enter** button to save the selection.

IGMP V3 Source Filter
Use the **Up** and **Down** buttons to move the cursor to "IGMP V3 Src Filter," then press the **Enter** button to access the Edit screen.

Filter Mode
1 Use the **Up** and **Down** buttons to move the cursor to "Filter Mode," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select either "Include" or "Exclude," then press the **Enter** button to save the selection.

Add IP
1 Use the **Up** and **Down** buttons to move the cursor to "Add IP," then press the **Enter** button.

2 Press the **Enter** button again to add an IP address to the list.
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Note: Existing IP addresses are shown before the "Add IP" option.

3 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP address, then press the Enter button to save the selection.

Note: A maximum of 64 IP addresses may be added to the list.

Edit/Remove an IP

Note: Existing IP addresses are shown before the "Add IP" option.

1 Use the Up and Down buttons to move the cursor to the desired IP address to edit, then press the Enter button.

2 Use the Left and Right buttons to select either "Edit" or "Remove," then press the Enter button.

Clear All

This option will clear all IP addresses in the filter list.

1 Use the Up and Down buttons to move the cursor to "Clear All," then press the Enter button.

2 Press the Enter button one more time to clear all the IP addresses in the list.
Receive 2

This section allows the user to setup the receive function of the second receive group.

1. Use the Up and Down buttons to move the cursor to "Receive 2," then press the Enter button.

```
Up/Down:  MPEG/IP 1-4  
Timeout: 0.5s
Receive 1
Receive 2
```

2. Use the Up and Down buttons to move the cursor to "Receive," then press the Enter button.

```
Up/Down:  MPEG/IP 1-4 2  
Receive: Enable
Phys Conn: Port 1
Ip: 239.192.0.1
```

3. Use the Up and Down buttons to "Enable" or "Disable" Receive 1, then press the Enter button to save the selection.

4. Use the Up and Down buttons to move the cursor to "Phys Conn," then press the Enter button.

```
Up/Down:  MPEG/IP 1-4 2
Receive: Enable
Phys Conn: Port 1
Ip: 239.192.0.1
```

5. Choose the physical connector using the Up and Down buttons ("Port 1" or "Port 2"), then press the Enter button.

**IP**

1. Use the Up and Down buttons to move the cursor to "IP," then press the Enter button.

```
Up/Down:  MPEG/IP 1-4  2
Ip: 239.192.0.001.050
Dest Port: 01050
FEC: Disable
```

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP, then press the Enter button to save the selection.

**Note:** A Unicast or Multicast IP address may be chosen.

Unicast: X.X.X.X – 223.255.255.255
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Multicast: 224.0.0.0 – 239.255.255
Suggested Multicast Range: 239.192.X.X

Destination Port
1  Use the Up and Down buttons to move the cursor to "Dest Port," then press the Enter button.

2  Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the port (0 – 65536), then press the Enter button to save the selection.

Forward Error Correction
This setting lets the decoder know if it should be expecting FEC data with the active receive group. If no FEC data is expected, this setting can be disabled to allow multicasts closer together on the same IP.
1  Use the Up and Down buttons to move the cursor to "FEC," then press the Enter button.

2  Use the Up and Down buttons to select "Enable" or "Disable," then press the Enter button to save the selection.

Synchronized Source Setup
1  Use the Up and Down buttons to move the cursor to "SSRC," then press the Enter button.

2  Use the Up and Down buttons to select "Enable" or "Disable," then press the Enter button to save the selection.
Buffer

1 Use the Up and Down buttons to move the cursor to "Buffer," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Buffer (from 3999 kb to 100 kb), then press the Enter button to save the selection.

IGMP V3 Source Filter

Use the Up and Down buttons to move the cursor to "IGMP V3 Src Filter," then press the Enter button to access the Edit screen.

Filter Mode

1 Use the Up and Down buttons to move the cursor to "Filter Mode," then press the Enter button.

2 Use the Up and Down buttons to select either "Include" or "Exclude," then press the Enter button to save the selection.

Add IP

1 Use the Up and Down buttons to move the cursor to "Add IP," then press the Enter button.

2 Press the Enter button again to add an IP address to the list.

Note: Existing IP addresses are shown before the "Add IP" option.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

3  Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the IP address, then press the **Enter** button to save the selection.

```
|↓↑| MPEG/IP 1-4 2 ---| |
| Filter Mode:Include |
| 000.000.000.000 |
| Clear All |
```

**Note:** A maximum of 64 IP addresses may be added to the list.

### Edit/Remove an IP

**Note:** Existing IP addresses are shown before the "Add IP" option.

1  Use the **Up** and **Down** buttons to move the cursor to the desired IP address to edit, then press the **Enter** button.

```
|↓↑| MPEG/IP 1-4 2 ---| |
| →239.192.20.3 |
| Add IP |
| Clear All |
```

2  Use the **Left** and **Right** buttons to select either "Edit" or "Remove," then press the **Enter** button.

```
|↓↑| MPEG/IP 1-4 2 ---| |
| Filter Mode:Include |
| Edit Remove |
| Add IP |
```

### Clear All

This option will clear all IP addresses in the filter list.

1  Use the **Up** and **Down** buttons to move the cursor to "Clear All," then press the **Enter** button.

```
|↓↑| MPEG/IP 1-4 2 ---| |
| 239.192.20.3 |
| Add IP |
| ▶Clear All |
```

2  Press the **Enter** button one more time to clear all the IP addresses in the list.

### Reset Counters

This option will reset the counters on the status screen for the MPEG/IP card.
Dual MPEG over IP Input/UDP Output Option

1. Use the **Up** and **Down** buttons to move the cursor to "Reset Counters," then press the **Enter** button.

![MPEG/IP 1-3]

Receive 1
Receive 2
►Reset Counters

2. Press the **Enter** button again to reset the counters.

### Output Control

To configure this card as an output, use the following steps:

1. Press the **Output** button.

   **Note:** For Configuration 2 units, select RDS1 or RDS2, then press **Enter**.

2. Use the **Up** and **Down** buttons to move the cursor to the "MPEG/IP" card of the specific slot (e.g. 1-4). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

![Output]

HD Video 2-1
►MPEG/IP 1-4

3. Press the **Enter** button once to display the selection screen for "Transmit 1" and "Transmit 2" of the MPEG/IP card.

### Transmit 1

1. Use the **Up** and **Down** buttons to move the cursor to "Transmit 1," then press the **Enter** button. The status will be displayed.

![MPEG/IP 1-4]

►Transmit 1
Transmit 2

2. Press the **Enter** button one more time to get to the Edit screen.

3. Use the **Up** and **Down** buttons to move the cursor to "Transmit," then press the **Enter** button.

![MPEG/IP 1-4]

►Transmit:Enabled
Phys Conn:Port 1
IP:239.192.0.1

4. Use the **Up** and **Down** buttons to set the Transmit 1 to "Enabled" or "Disabled," then press the **Enter** button to save the selection.
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5 Use the Up and Down buttons to move the cursor to "Phys Conn," then press the Enter button.

6 Choose the physical connector using the Up and Down buttons ("Port 1" or "Port 2"), then press the Enter button.

IP
1 Use the Up and Down buttons to move the cursor to "IP," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP, then press the Enter button to save the selection.

Destination Port
1 Use the Up and Down buttons to move the cursor to "Dest Port," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the destination port (1025 – 65536), then press the Enter button to save the selection.

Source Port
1 Use the Up and Down buttons to move the cursor to "Source Port," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the destination port (1025 – 65536), then press the Enter button to save the selection.
Packets Per Frame
1. Use the Up and Down buttons to move the cursor to "Packets/Ip," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the number of packets per frame (1 – 7), then press the Enter button to save the selection.

Differentiated Services
1. Use the Up and Down buttons to move the cursor to "DiffServ," then press the Enter button.

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change between ("Default", "AF11", "AF12", "AF13", "AF21", "AF22", "AF23", "AF31", "AF32", "AF33", "AF41", "AF42", "AF43", "EF"), then press the Enter button to save the selection.

Transmit 2
1. Use the Up and Down buttons to move the cursor to "Transmit 2," then press the Enter button.

2. Press the Enter button one more time to get to the Edit screen.

3. Use the Up and Down buttons to move the cursor to "Transmit," then press the Enter button.

4. Use the Up and Down buttons to change the selection to "Enabled," then press the Enter button to save the selection.
5 Use the **Up** and **Down** buttons to move the cursor to "Phys Conn," then press the **Enter** button.

```
↑↓ MPEG/IP 1-4
Receive: Enabled
Phys Conn: Port 2
IP: 239.192.0.1
```

6 Choose the physical connector using the **Up** and **Down** buttons ("Port 1" or "Port 2"), then press the **Enter** button.

**IP**

1 Use the **Up** and **Down** buttons to move the cursor to "IP," then press the **Enter** button.

```
↑↓ MPEG/IP 1-4
IP: 239.192.0.000.001
Dest Port:01030
Source Port:01030
```

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the IP, then press the **Enter** button to save the selection.

**Destination Port**

1 Use the **Up** and **Down** buttons to move the cursor to "Dest Port," then press the **Enter** button.

```
↑↓ MPEG/IP 1-4
IP: 239.192.0.1
Dest Port:01030
Source Port:01030
```

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the destination port (1025 – 65536), then press the **Enter** button to save the selection.

**Source Port**

1 Use the **Up** and **Down** buttons to move the cursor to "Source Port," then press the **Enter** button.

```
↑↓ MPEG/IP 1-4
IP: 239.192.0.1
Dest Port:01030
Source Port:01030
```

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the destination port (1025 – 65536), then press the **Enter** button to save the selection.
Packets Per Frame
1. Use the **Up** and **Down** buttons to move the cursor to "Packets/Ip," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the number of packets per frame (1 – 7), then press the **Enter** button to save the selection.

Differentiated Services
1. Use the **Up** and **Down** buttons to move the cursor to "DiffServ," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the desired differentiated services ("Default", "AF11", "AF12", "AF13", "AF21", "AF22", "AF23", "AF31", "AF32", "AF33", "AF41", "AF42", "AF43", "EF"), then press the **Enter** button to save the selection.
PID Filtering Dual MPEG over IP UDP Output Option

General Information

Install Location: Installs in 1–2 through 1–4 and/or 2–2 through 2–4.

O: (2) 10/100/1000 Auto-negotiating Base-T RJ-45 Ethernet Port

Supported Formats: Transmit: UDP only

Description: This card supports PID filtering and automatic table modification. This output card will use two Ethernet connections independently to transmit MPEG2 transport streams over IP networks from a valid input source (ASI, DVB-S2, 8727 IP input, etc.) A multi program transport stream (MPTS) input can be reduced into as many as 5 output transport streams. Any combination of services present in the source stream may be selected for the output transport stream. Each output IP stream can then be routed to one of two Ethernet ports as desired. The PID Filtering Dual MPEG over IP UDP Output option can also adapt the transport stream bitrate and recalculate the PCR values in the output transport streams to be correct for the new multiplex.

Menu Control

This menu is used to set the Default Gateway Port, configure ICMP, find the MAC address, and setup the IP addresses, Subnet Masks, and Gateways for both ports on the PID Filtering card. These settings need to be set to proper values for the network that the D9887B receiver is being used on. These values can usually be obtained from the local network administrator.

1  Press the Menu button.

2  Use the Up and Down buttons to move the cursor to "PID Filter IP NetCfg," then press the Enter button.
**Default Gateway Port**

1. To set the Default Gateway Port, use the Up and Down buttons to move the cursor to "Set Default Gw Port," then press the Enter button.

```
↓↑ PID Filter IP Cfg ↓
  Port 1
  Port 2
  ►Set Default Gw Port
```

2. Press Enter again and use the Up and Down buttons to select "Port1" or "Port2," then press the Enter button.

```
↓↑ PID Filter 1-4 IP ↓
  Default Gw Port
```

**ICMP(Ping)**

1. Use the Up and Down buttons to move the cursor to "Set ICMP(Ping)," then press the Enter button.

```
↓↑ PID Filter IP Cfg ↓
  Port 2
  Set Default Gw Port
  ►Set ICMP(Ping)
```

2. Press Enter again and use the Up and Down buttons to select "Enabled" or "Disabled," then press the Enter button.

```
↓↑ PID Filter 1-4 IP ↓
  ICMP(ping):Enabled
```

**Port Setup**

1. Select "Port 1" or "Port 2" and then press the Enter button.

```
↓↑ PID Filter IP Cfg ↓
  Port 1
  Port 2
  Set Default Gw Port
```
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

2 The MAC address is now displayed for the port that was chosen. The Link status and Agr Bit Rate is also displayed.

```
↑↓ PID Filt Port 1  ↓
MAC: 00:01:2A:8C:D1:23
Link: Down
Agr Bit Rate: 39.33Mbps
```

3 Press the Enter button.

IP Address/Subnet Mask/Gateway

1 Use the Up and Down buttons to move the cursor to "IP Address," then press the Enter button.

```
↑↓ PID Filt Port 1  ↓
IP Address
010.000.000.051
Subnet Mask
```

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP, then press the Enter button to save the selection.

3 The cursor will now be on "Subnet Mask."

```
↑↓ PID Filt Port 1  ↓
10.0.0.51
Subnet Mask
255.000.000.000
```

4 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Subnet Mask, then press the Enter button to save the selection.

5 The cursor will now be on "Gateway."

```
↑↓ PID Filt Port 1  ↓
255.0.0.0
Gateway
000.000.000.000
```

6 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Gateway, then press the Enter button to save the selection.
Output Control

1. Press the Output button.
   
   Note: For Configuration 2 units, select RDS1 or RDS2, then press Enter.

2. Use the Up and Down buttons to move the cursor to the "PID Filter IP" card of the specific slot (e.g. 1-4). Notice the location diagram in the upper right corner of the screen changes as the cursor moves by each card.

   ![Diagram of Output Control]

3. Press the Enter button once to display the selection screen for "Transmit 1", "Transmit 2", "Transmit 3", Transmit 4", and "Transmit 5" of the PID Filter IP card.

Transmit 1

Note: Transmit 2-5 can be set up using the same instructions.

Use the Up and Down buttons to move the cursor to "Transmit 1," then press the Enter button.

![Diagram of Transmit 1]

Transmit Status/Set

1. Use the Up and Down buttons to move the cursor to "Transmit Status/Set," then press the Enter button. The status screen is now displayed.

   ![Diagram of Transmit Status/Set]

2. Press the Enter button one more time to get to the Edit screen.

3. Use the Up and Down buttons to move the cursor to "Transmit," then press the Enter button.
4 Use the Up and Down buttons to set the Transmit to "Enabled" or "Disabled," then press the Enter button to save the selection.

5 Use the Up and Down buttons to move the cursor to "Filtering," then press the Enter button.

6 Use the Up and Down buttons to set the Filtering to "Enabled" or "Disabled," then press the Enter button to save the selection.

7 Use the Up and Down buttons to move the cursor to "Processing," then press the Enter button.

8 Use the Up and Down buttons to set the Filtering to "PSI(MPEG)" or "SI(DVB)," then press the Enter button to save the selection.

9 Use the Up and Down buttons to move the cursor to "Out TS Rt," then press the Enter button.

10 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Output Bitrate, then press the Enter button to save the selection.

11 Use the Up and Down buttons to move the cursor to "Phys Conn," then press the Enter button.

12 Use the Up and Down buttons to set the Filtering to "Port 1" or "Port 2," then press the Enter button to save the selection.
PID Filtering Dual MPEG over IP UDP Output Option

IP

1 Use the **Up** and **Down** buttons to move the cursor to "IP," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the IP, then press the **Enter** button to save the selection.

Destination Port

1 Use the **Up** and **Down** buttons to move the cursor to "Dest Port," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the destination port (1025 – 65536), then press the **Enter** button to save the selection.

Source Port

1 Use the **Up** and **Down** buttons to move the cursor to "Source Port," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the destination port (1025 – 65536), then press the **Enter** button to save the selection.

Packets Per Frame

1 Use the **Up** and **Down** buttons to move the cursor to "Packets/Ip," then press the **Enter** button.
Chapter 4 Using the Front Panel to Configure the D9887B HDTV Modular Receiver

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change the number of packets per frame (1–7), then press the **Enter** button to save the selection.

**Time To Live**

1 Use the **Up** and **Down** buttons to move the cursor to "TTL," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to change to a value between "000" and "255," then press the **Enter** button to save the selection.

**Service Filter Setup**

1 Use the **Up** and **Down** buttons to move the cursor to "Service Filter Setup," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to move the cursor to the desired program, then press the **Enter** button.

3 Use the **Up** and **Down** buttons to turn on filtering for the desired program by changing the symbol from □ to ◆, then press the **Enter** button.

**PID Filter Setup**

1 Use the **Up** and **Down** buttons to move the cursor to "PID Filter Setup," then press the **Enter** button.
2 Use the **Up** and **Down** buttons to move the cursor to "PID 1:0x," then press the **Enter** button.

3 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to set the PID to a Hex value, then press the **Enter** button to save the selection.

   **Note:** Use the same steps to set the PID value for PIDs 2-10.

4 Use the **Up** and **Down** buttons to move the cursor to "PID 1," then press the **Enter** button.

5 Use the **Up** and **Down** buttons to set the PID 1 to "Enabled" or "Disabled," then press the **Enter** button to save the selection.

6 Use the **Up** and **Down** buttons to move the cursor to "PID 1," then press the **Enter** button.

7 Use the **Up** and **Down** buttons to set the PID 1 to "Enabled" or "Disabled," then press the **Enter** button to save the selection.
MPEG-2/MPEG-4 4:2:0 Decoder (1 Video, 2 Audio) Option

**General Information**

**Install Location:** Not Field Upgradeable

**I/O:** The input and output is done through the various other I/O cards. (e.g. 8VSB/QAM Receiver option)

**Supported Formats:** MPEG-2, MPEG-4, and all formats supported by the option cards.

**Description:** The D9887B receiver can be configured as a Single RDS or as a Dual RDS. As a Single RDS, the D9887B receiver has only one MPEG Decoder. As a Dual RDS, the D9887B receiver has two MPEG Decoders. The D9887B receiver can be configured, when ordering, to act as two separate RDSs or as one RDS with two decoders to enable four audio processors.

**Decoder Setup**

To setup the D9887B receiver to be able to decode the incoming audio and video, use the following steps.

1. Press the **Home** button to bring the display back to the RDS status screen.
2. Press the **Left** button to access the RDS 1 Decoder Menu.
   
   **Note:** For Configuration 2 units, all of the following instructions apply exactly the same except, use the **Right** button to access the RDS 2 Decoder Menu.

3. Use the **Up** and **Down** buttons to move the cursor to "Service Setup," then press the **Enter** button.

4. Press the **Enter** button again to display the Edit screen for the RDS 1 Decoder.
MPEG-2/MPEG-4 4:2:0 Decoder (1 Video, 2 Audio) Option

**Tune Mode**

1. Use the **Up** and **Down** buttons to move the cursor to "Tune Mode," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select the desired mode ("Auto", "No PSI", "PID Lock", "Priority"), then press the **Enter** button to save the selection.

**PID Lock Mode**

This mode is the most desirable and will produce the most consistent output. If possible, this mode should always be used.

**PID Select**

PID Select determines how the PID will be entered during the following steps. The "Manual" mode allows any PID to be entered. In "List" mode, the D9887B receiver will only allow the PIDs to be entered that are in the PMT. In the following steps, only the **Up** and **Down** buttons are needed to change the PID if this option is set to "List."

1. Use the **Up** and **Down** buttons to move the cursor to "PID Select," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select either "Manual" or "List," then press the **Enter** button to save the selection.

**PCR**

1. Use the **Up** and **Down** buttons to move the cursor to "PCR PID," then press the **Enter** button.

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to set the PID, then press the **Enter** button to save the selection.
Chapter 4  Using the Front Pane to Configure the D9887B HDTV Modular Receiver

Video
1 Use the Up and Down buttons to move the cursor to "Video PID," then press the Enter button.

<table>
<thead>
<tr>
<th>Serv Setup</th>
<th>PID Select: Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PCR PID : 0x0031</td>
</tr>
<tr>
<td></td>
<td>Video PID : 0x0000</td>
</tr>
</tbody>
</table>

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.

Audio 1 PID
1 Use the Up and Down buttons to move the cursor to "Aud 1 PID," then press the Enter button.

<table>
<thead>
<tr>
<th>Serv Setup</th>
<th>PID Select: Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PCR PID : 0x0031</td>
</tr>
<tr>
<td></td>
<td>Video PID : 0x0031</td>
</tr>
<tr>
<td></td>
<td>Aud 1 PID: 0x0000</td>
</tr>
</tbody>
</table>

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.

Audio 2 PID
1 Use the Up and Down buttons to move the cursor to "Aud 2 PID," then press the Enter button.

<table>
<thead>
<tr>
<th>Serv Setup</th>
<th>PID Select: Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Video PID : 0x0031</td>
</tr>
<tr>
<td></td>
<td>Aud 1 PID: 0x0034</td>
</tr>
<tr>
<td></td>
<td>Aud 2 PID: 0x0000</td>
</tr>
</tbody>
</table>

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.

Audio 3 PID
Note: This menu is only available if the unit is equipped with a second decoder in Configuration 1.
1 Use the Up and Down buttons to move the cursor to "Aud 3 PID," then press the Enter button.

<table>
<thead>
<tr>
<th>Serv Setup</th>
<th>PID Select: Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aud 1 PID: 0x0034</td>
</tr>
<tr>
<td></td>
<td>Aud 2 PID: 0x0035</td>
</tr>
<tr>
<td></td>
<td>Aud 3 PID: 0x0000</td>
</tr>
</tbody>
</table>

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.
Audio 4 PID

Note: This menu is only available if the unit is equipped with a second decoder in Configuration 1.

1. Use the **Up** and **Down** buttons to move the cursor to "Aud 4 PID," then press the **Enter** button.

   ![Serv Setup]
   
   ```
   ↑↓ Serv Setup
   Aud 2 PID:0x0035
   Aud 3 PID:0x0036
   ►Aud 4 PID:0x0000
   ```

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to set the PID, then press the **Enter** button to save the selection.

Dolby E 1

Note: This option is only available if there is an Audio Output (Dolby E, AES Digital, Analog) option audio output card installed.

1. Use the **Up** and **Down** buttons to move the cursor to "DlbyE1 PID," then press the **Enter** button.

   ![Serv Setup]
   
   ```
   ↑↓ Serv Setup
   Aud 3 PID:0x0036
   Aud 4 PID:0x0037
   ►DlbyE1 PID:0x0000
   ```

2. Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to set the PID, then press the **Enter** button to save the selection.

Priority Mode

This mode is generally used with two identical streams for redundancy.

Priority 1

1. Use the **Up** and **Down** buttons to move the cursor to "Priority 1," then press the **Enter** button.

   ![Serv Setup]
   
   ```
   ↑↓ Serv Setup
   Tune Mode:Priority
   ►Priority 1:Manual
   Service:
   ```

2. Use the **Up** and **Down** buttons to select either "Manual" or "List," then press the **Enter** button to save the selection.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Service
1  Use the Up and Down buttons to move the cursor to "Service," then press the Enter button.

2  Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to select the program, then press the Enter button to save the selection.

Audio 1 Index
1  Use the Up and Down buttons to move the cursor to "Aud1 Index," then press the Enter button.

2  Use the Up and Down buttons to set the desired audio index (0 – 65535), then press the Enter button to save the selection.

Audio 2 Index
1  Use the Up and Down buttons to move the cursor to "Audio 2 Index," then press the Enter button.

2  Use the Up and Down buttons to set the desired audio index (0 – 65535), then press the Enter button to save the selection.

Note: Use the previous steps to setup the Priority 2 as well.

Audio 3 Index
Note: This menu is only available if the unit is equipped with a second decoder in Configuration 1.
1  Use the Up and Down buttons to move the cursor to "Aud3 Index," then press the Enter button.
2 Use the **Up** and **Down** buttons to set the desired audio index (0 – 65535), then press the **Enter** button to save the selection.

**Audio 4 Index**

**Note:** This menu is only available if the unit is equipped with a second decoder in Configuration 1.

1 Use the **Up** and **Down** buttons to move the cursor to "Aud4 Index," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to set the desired audio index (0 – 65535), then press the **Enter** button to save the selection.

**Note:** Use the previous steps to setup the Priority 2 as well.

**No PSI Mode**

This mode should only be used if both the PID information and audio/video formats are known about the stream.

**Note:** This menu is only available if the "Tune Mode" is set to "No PSI."

**PCR PID**

1 Use the **Up** and **Down** buttons to move the cursor to "PCR PID," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit, then use the **Up** and **Down** buttons to set the desired PCR PID in the stream, then press the **Enter** button to save the PID.

**Video PID**

1 Use the **Up** and **Down** buttons to move the cursor to "Video PID," then press the **Enter** button.
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2 Use the **Left** and **Right** buttons to select the column to edit, then use the **Up** and **Down** buttons to set the desired Video PID in the stream, then press the **Enter** button to save the PID.

**Video Type**

1 Use the **Up** and **Down** buttons to move the cursor to "Video Type," then press the **Enter** button.

```
Serv Setup ->.l
  Video PID :0x0000
  Video Type:MPEG 2
  Aud 1 PID:0x0000
```

2 Use the **Up** and **Down** buttons to select the video type ("MPEG 2" or "H.264") on the PID chosen above, then press the **Enter** button.

**Audio 1 PID**

1 Use the **Up** and **Down** buttons to move the cursor to "Aud 1 PID," then press the **Enter** button.

```
Serv Setup ->.l
  Video Type:MPEG 2
  Aud 1 PID:0x0000
  Audio1 Typ:--------
```

2 Use the **Left** and **Right** buttons to select the column to edit, then use the **Up** and **Down** buttons to select the desired Audio PID in the stream, then press the **Enter** button to save the PID.

**Audio 1 Type**

1 Use the **Up** and **Down** buttons to move the cursor to "Audio1 Typ," then press the **Enter** button.

```
Serv Setup ->.l
  Aud 1 PID:0x0022
  Audio1 Typ:--------
  Aud 2 PID:0x0000
```

2 Use the **Up** and **Down** buttons to select the audio type ("Dolby AC3", "AAC ADTS", "AAC LOAS", "Dolby D +", "MPEG 1", "MPEG 2") on the PID chosen above, then press the **Enter** button.
Audio 2 PID
1 Use the Up and Down buttons to move the cursor to "Aud 2 PID," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit, then use the Up and Down buttons to select the desired Audio PID in the stream, then press the Enter button to save the PID.

Audio 2 Type
1 Use the Up and Down buttons to move the cursor to "Audio2 Typ," then press the Enter button.

2 Use the Up and Down buttons to select the audio type ("Dolby AC3", "AAC ADTS", "AAC LOAS", "Dolby D +", "MPEG 1", "MPEG 2") on the PID chosen above, then press the Enter button.

Audio 3 PID
Note: This menu is only available if the unit is equipped with a second decoder in Configuration 1.
1 Use the Up and Down buttons to move the cursor to "Aud 3 PID," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit, then use the Up and Down buttons to select the desired Audio PID in the stream, then press the Enter button to save the PID.

Audio 3 Type
Note: This menu is only available if the unit is equipped with a second decoder in Configuration 1.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

1 Use the **Up** and **Down** buttons to move the cursor to "Audio1 Typ," then press the **Enter** button.

```
† Serv Setup
  ▼Aud 3 PID:0x0002
  ▼Aud 4 PID:0x0000
  ▼Audio3 Typ:Dolby AC3
  ▼Audio4 Typ:----
```

2 Use the **Up** and **Down** buttons to select the audio type ("Dolby AC3", "AAC ADTS", "AAC LOAS", "Dolby D +", "MPEG 1", "MPEG 2") on the PID chosen above, then press the **Enter** button.

**Audio 4 PID**

*Note:* This menu is only available if the unit is equipped with a second decoder in Configuration 1.

1 Use the **Up** and **Down** buttons to move the cursor to "Aud 4 PID," then press the **Enter** button.

```
† Serv Setup
  ▼Aud 4 PID:0x0000
  ▼Audio4 Typ:-----
```

2 Use the **Left** and **Right** buttons to select the column to edit, then use the **Up** and **Down** buttons to select the desired Audio PID in the stream, then press the **Enter** button to save the PID.

**Audio 4 Type**

*Note:* This menu is only available if the unit is equipped with a second decoder in Configuration 1.

1 Use the **Up** and **Down** buttons to move the cursor to "Audio4 Typ," then press the **Enter** button.

```
† Serv Setup
  ▼Aud 4 PID:0x0024
  ▼Audio4 Typ:Dolby D +
  ▼DolbyE1 PID:0x0000
```

2 Use the **Up** and **Down** buttons to select the audio type ("Dolby AC3", "AAC ADTS", "AAC LOAS", "Dolby D +", "MPEG 1", "MPEG 2") on the PID chosen above, then press the **Enter** button.

**Dolby E 1**

*Note:* This option is only available if there is an Audio Output (Dolby E, AES Digital, Analog) option audio output output card installed.
1 Use the **Up** and **Down** buttons to move the cursor to "Dolby E1 PID," then press the **Enter** button.

2 Use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to set the Dolby E1 PID, then press the **Enter** button to save the selection.

**Auto Mode**

This mode should only be used if no PID information is known about the stream.

**Auto Program**

*Note:* This menu is only available if the "Tune Mode" is set to "Auto."

1 Use the **Up** and **Down** buttons to move the cursor to "Auto," then press the **Enter** button.

2 Use the **Up** and **Down** buttons to select the desired Service number in the stream, then press the **Enter** button to save the selection.

**SDI Audio Embedding**

SDI Audio Embedding places decoded or pass through audio in the video horizontal space in one of 4 available locations. The 4 locations are Group 1 – pair 1 and pair 2, and Group 2 pair 1 and 2. If there is an Audio Output (Dolby E, AES Digital, Analog) option card installed, then Dolby E audio can be embedded. To setup the assignment audio to one of the SDI audio embedding locations, use the following steps:

1 Start out at the home screen (where it shows the TS bit rate).
2 Press the **Left** button.
3 Use the **Up** and **Down** buttons to move the cursor to "SDI Aud Embed," then press the **Enter** button.
Chapter 4 Using the Front Panel to Configure the D9887B HDTV Modular Receiver

4 The current settings are displayed. Press the Enter button again to edit the settings.

5 Use the Up and Down buttons to move the cursor to the pair location for the embedded audio, Group 1 "Pr1" or "Pr2", and Group 2 "Pr1" or "Pr2," then press the Enter button to edit the assigned audio.

6 Use the Up and Down buttons to select the audio that is assigned to the pair, "Off", "Aud 1 PCM", Aud 1 Dig. Pass", "Aud 2 PCM", or "Aud 2 Dig. Pass." If an Audio Output (Dolby E, AES Digital, Analog) option card is installed in the RDS, "DolbyE" is an additional audio option. Press the Enter button to save the selection.

Audio 1 Setup

The following menus are used to setup the audio downmix settings.

Note: Refer to Appendix E - D9887B Receiver Audio Explanation (on page 311) for the D9887B receiver Audio Explanation.

Note: These settings do not apply to Dolby E audio.

Use the following instructions to setup Audio 1-4 (if equipped).

1 Use the Up and Down buttons to move the cursor to "Audio 1 Setup," then press the Enter button.

2 The current screen shows the status of the audio downmix settings. Press the Enter button again to display the Edit screen.

Mode

1 Use the Up and Down buttons to move the cursor to "Mode," then press the Enter button.

2 Use the Up and Down buttons to select the desired downmix type ("Monitor", "Transmission", and User"), then press the Enter button to save the selection.
The following are set for each Mode:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Compression</th>
<th>Downmix</th>
<th>Dynamic Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>Custom 1</td>
<td>2/0 LR</td>
<td>Disabled</td>
</tr>
<tr>
<td>Monitor</td>
<td>Line Mode</td>
<td>2/0 LR</td>
<td>Enabled</td>
</tr>
<tr>
<td>Transmission</td>
<td>RF Mode</td>
<td>2/0 LtRt</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

Each Mode allows the following to be changed:

- User: Compression, Downmix, Dynamic Range
- Monitor: Compression
- Transmission: no changes

**Compression**

1. Use the **Up** and **Down** buttons to move the cursor to "Compress," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select the desired compression ("RF Mode", "Line Mode", "Custom 0", "Custom 1"), then press the **Enter** button to save the selection.

**Downmix**

1. Use the **Up** and **Down** buttons to move the cursor to "Ch Downmix," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to select the desired downmix ("2/0 LR", "2/0 Auto", "2/0 LtRt", "MonoChan1", "MonoChan2"), then press the **Enter** button to save the selection.

**Note:** The "2/0 Auto" is used by Dolby Digital Plus (EAC3) to use "2/0 LR" or "2/0 LtRt" based on the received audio metadata. If the metadata is not present, like for Dolby Digital (AC3), "2/0 LtRt" is used.
Dynamic Range
1. Use the Up and Down buttons to move the cursor to "Dyn Range," then press the Enter button.

2. Use the Up and Down buttons to set the Dynamic Range to "Enabled" or "Disabled," then press the Enter button to save the selection.

Source ID Setup
There are two modes that the Source ID can be obtained – Auto or Manual. In Auto mode, the unit attempts to discover the Source ID that is signaled in the stream. The user specifies a timeout for the length of time the unit searches for the Source ID in the stream. If not found, the user entered name is used. In Manual mode, the user entered name is used. To setup the Source ID, use the following steps:

1. Start out at the home screen (where it shows the TS bit rate).
2. Press the Left button.
3. Use the Up and Down buttons to move the cursor to "Source ID," then press the Enter button.
4. Press the Enter button again to edit the Source ID settings.
5. Use the Up and Down buttons to move the cursor to the item to be edited, then press the Enter button to edit the assigned value.
6. For the "Lookup" value, use the Up and Down buttons to select "Auto" or "Manual." Press the Enter button to save the selection.
For the "Name" value, use the **Left** and **Right** buttons to select the column to edit and use the **Up** and **Down** buttons to select the character. When finished, press the **Enter** button to save the selection.

For the "ID Timeout", use the **Up** and **Down** buttons to select "05", "10", "15", "20", "25", "30", "60", "90" or "120" seconds. Press the **Enter** button to save the selection.

---

**Buffer Mode Video Latency**

There are two video latency modes that can be entered – Normal and Low Latency. To setup the video latency mode, use the following steps:

1. Start out at the home screen (where it shows the TS bit rate).
2. Press the **Left** button.
3. Use the **Up** and **Down** buttons to move the cursor to "Advanced Settings," then press the **Enter** button.
4. Press the **Enter** button again to edit the settings.
5. Use the **Up** and **Down** buttons to select the Buffer Mode value "Normal" or "Lw Latncy," then press the **Enter** button to save the selection.
MPEG2 Decoder 4:2:2 with Genlock (1 Video, 4 Audio) Option

General Information

Install Location: Not Field Upgradeable

I/O: The input is done through the various other input option cards (e.g. 8VSB/QAM Receiver). The output is done through the Video Output (2 HD/SDI, 1 RGBHV/YPbPr/Comp) option.

Supported Formats: This option card can decode MPEG-2 4:2:2, and the formats supported by the Video output (2 HD/SDI, 1 RGBHV/YPbPr/Comp) option card.

Description: With this decoder board the D9887B receiver can only be configured as a Single RDS. Meaning only one MPEG Decoder. The D9887B receiver with this decoder board can be configured to process four audio streams.

Decoder Setup

To setup the D9887B receiver to be able to decode the incoming audio and video, use the following steps.

1. Press the Home button to bring the display back to the RDS status screen.
2. Press the Left and Right button to access the Decoder Menu.
   Note: With this Decoder card, the D9887B receiver can only have one decoder so either of the Left and Right buttons will display the same decoder menu.
3. Use the Up and Down buttons to move the cursor to "Service Setup," then press the Enter button. The Service Setup status is displayed.

   ┌──┐
   │ RDS 1 ───┐
   │ Service Setup |--┐
   │ Sdi Aud Embed └──→
   │ Video Status 

4. Press the Enter button again to display the Edit screen for the Service Setup.

Tune Mode

1. Use the Up and Down buttons to move the cursor to "Tune Mode," then press the Enter button.

   ┌──┐
   │ Serv Setup ───┐
   │ Tune Mode:Pid Lock |–┐
   │ PID Select:Manual └──→
   │ PCR PID :0x0000 

2 Use the Up and Down buttons to select the desired mode ("Auto", "No PSI", "PID Lock", "Priority"), then press the Enter button to save the selection.

**PID Lock Mode**

This mode is the most desirable and will produce the most consistent output. If possible, this mode should always be used.

**PID Select**

PID Select determines how the PID will be entered during the following steps. The "Manual" mode allows any PID to be entered. In "List" mode, the D9887B receiver will only allow the PIDs to be selected that are in the PMT. The "List" mode is only selectable when the input is receiving a PMT. The "Manual" mode is shown.

1 Use the Up and Down buttons to move the cursor to "PID Select," then press the Enter button.

```
| Serv Setup | .1 |
| Tune Mode: PID Lock |
| PID Select: Manual |
| PCR PID: 0x0000 |
```

2 Use the Up and Down buttons to select either "Manual" or "List," then press the Enter button to save the selection.

**PCR**

1 Use the Up and Down buttons to move the cursor to "PCR PID," then press the Enter button.

```
| Serv Setup | .1 |
| Tune Mode: PID Lock |
| PID Select: Manual |
| PCR PID: 0x0000 |
```

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.

**Video**

1 Use the Up and Down buttons to move the cursor to "Video PID," then press the Enter button.

```
| Serv Setup | .1 |
| PID Select: Manual |
| PCR PID: 0x0013 |
| Video PID: 0x0000 |
```

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Audio 1 PID

1. Use the Up and Down buttons to move the cursor to "Aud 1 PID," then press the Enter button.

<table>
<thead>
<tr>
<th>Serv Setup</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FCR PID</td>
<td>0x0031</td>
<td></td>
</tr>
<tr>
<td>Video PID</td>
<td>0x0031</td>
<td></td>
</tr>
<tr>
<td>Aud 1 PID</td>
<td>0x0000</td>
<td></td>
</tr>
</tbody>
</table>

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.

Audio 2 PID

1. Use the Up and Down buttons to move the cursor to "Aud 2 PID," then press the Enter button.

<table>
<thead>
<tr>
<th>Serv Setup</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Video PID</td>
<td>0x0031</td>
<td></td>
</tr>
<tr>
<td>Aud 1 PID</td>
<td>0x0034</td>
<td></td>
</tr>
<tr>
<td>Aud 2 PID</td>
<td>0x0000</td>
<td></td>
</tr>
</tbody>
</table>

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.

Audio 3 PID

1. Use the Up and Down buttons to move the cursor to "Aud 3 PID," then press the Enter button.

<table>
<thead>
<tr>
<th>Serv Setup</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aud 1 PID</td>
<td>0x0034</td>
<td></td>
</tr>
<tr>
<td>Aud 2 PID</td>
<td>0x0035</td>
<td></td>
</tr>
<tr>
<td>Aud 3 PID</td>
<td>0x0000</td>
<td></td>
</tr>
</tbody>
</table>

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.

Audio 4 PID

1. Use the Up and Down buttons to move the cursor to "Aud 4 PID," then press the Enter button.

<table>
<thead>
<tr>
<th>Serv Setup</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aud 2 PID</td>
<td>0x0035</td>
<td></td>
</tr>
<tr>
<td>Aud 3 PID</td>
<td>0x0036</td>
<td></td>
</tr>
<tr>
<td>Aud 4 PID</td>
<td>0x0000</td>
<td></td>
</tr>
</tbody>
</table>

2. Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to set the PID, then press the Enter button to save the selection.
Priority Mode
This mode is generally used with two identical streams for redundancy.

Priority 1
1 Use the Up and Down buttons to move the cursor to "Priority 1," then press the Enter button.

2 Use the Up and Down buttons to select either "Manual" or "List," then press the Enter button to save the selection.

Note: In "List" mode, the D9887B receiver will only allow the Services to be selected that are in the PMT. The "Manual" mode is shown.

Note: The "List" mode is only selectable when the input is receiving a PMT.

Service
1 Use the Up and Down buttons to move the cursor to "Service," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to select the program, then press the Enter button to save the selection.

Audio 1 Index
1 Use the Up and Down buttons to move the cursor to "Aud1 Index," then press the Enter button.

2 Use the Up and Down buttons to select the desired audio, then press the Enter button to save the selection.
Audio 2 Index
1. Use the Up and Down buttons to move the cursor to "Aud2 Index," then press the Enter button.

2. Use the Up and Down buttons to select the desired audio, then press the Enter button to save the selection.

Audio 3 Index
1. Use the Up and Down buttons to move the cursor to "Aud3 Index," then press the Enter button.

2. Use the Up and Down buttons to select the desired audio, then press the Enter button to save the selection.

Audio 4 Index
1. Use the Up and Down buttons to move the cursor to "Aud4 Index," then press the Enter button.

2. Use the Up and Down buttons to select the desired audio, then press the Enter button to save the selection.

Note: Then use the steps above to setup Priority 2.

No PSI Mode
This mode should only be used if both the PID information and audio/video formats are known about the stream.
MPEG2 Decoder 4:2:2 with Genlock (1 Video, 4 Audio) Option

PCR PID

Note: This menu is only available if the "Tune Mode" is set to "No PSI."

1. Use the **Up** and **Down** buttons to move the cursor to "PCR PID," then press the **Enter** button.

   ![Serv Setup Menu]
   
   - **Tune Mode:** No PSI
   - **PCR PID:** 0x0000
   - **Video PID:** 0x0000

2. Use the **Left** and **Right** buttons to select the column to edit, then use the **Up** and **Down** buttons to set the desired PCR PID, then press the **Enter** button to save the PID.

Video PID

1. Use the **Up** and **Down** buttons to move the cursor to "Video PID," then press the **Enter** button.

   ![Serv Setup Menu]
   
   - **Tune Mode:** No PSI
   - **PCR PID:** 0x0000
   - **Video PID:** 0x0000

2. Use the **Left** and **Right** buttons to select the column to edit, then use the **Up** and **Down** buttons to set the desired Video PID, then press the **Enter** button to save the PID.

Video Type

The only video type that is supported by the MPEG-2 Decoder 4:2:2 with Genlock (1 Video, 4 Audio) decoder is MPEG 2. This value is set and cannot be changed.

Audio 1 PID

1. Use the **Up** and **Down** buttons to move the cursor to "Aud 1 PID," then press the **Enter** button.

   ![Serv Setup Menu]
   
   - **Video PID:** 0x0000
   - **Video Type:** MPEG 2
   - **Aud 1 PID:** 0x0000

2. Use the **Left** and **Right** buttons to select the column to edit, then use the **Up** and **Down** buttons to select the desired Audio PID in the stream, then press the **Enter** button to save the PID.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Audio 1 Type
1 Use the Up and Down buttons to move the cursor to "Audio1 Typ," then press the Enter button.

| Serv Setup | Video Type:MPEG 2 | Aud 1 PID:0x0022 | Audio1 Typ:Dolby AC3 |

2 Use the Up and Down buttons to select the audio type ("Dolby AC3", "Dolby E", "MPEG 1", "MPEG 2") on the PID chosen above, then press the Enter button.

Audio 2 PID
1 Use the Up and Down buttons to move the cursor to "Aud 2 PID," then press the Enter button.

| Serv Setup | Audio1 Typ:Dolby AC3 | Aud 2 PID:0x0000 | Audio2 Typ:Dolby AC3 |

2 Use the Left and Right buttons to select the column to edit, then use the Up and Down buttons to select the desired Audio PID in the stream, then press the Enter button to save the PID.

Audio 2 Type
1 Use the Up and Down buttons to move the cursor to "Audio2 Typ," then press the Enter button.

| Serv Setup | Audio1 Typ:Dolby AC3 | Aud 2 PID:0x0024 | Audio2 Typ:Dolby AC3 |

2 Use the Up and Down buttons to select the audio type ("Dolby AC3", "Dolby E", "MPEG 1", "MPEG 2") on the PID chosen above, then press the Enter button.

Audio 3 PID
1 Use the Up and Down buttons to move the cursor to "Aud 3 PID," then press the Enter button.

| Serv Setup | Audio2 Typ:Dolby AC3 | Aud 3 PID:0x0000 | Audio3 Typ:Dolby AC3 |

2 Use the Left and Right buttons to select the column to edit, then use the Up and Down buttons to select the desired Audio PID in the stream, then press the Enter button to save the PID.
Audio 3 Type
1. Use the Up and Down buttons to move the cursor to "Audio3 Typ," then press the Enter button.

   ![Serv Setup Menu]
   - Audio2 PID: 0x0024
   - Aud 3 Typ: 0x0026
   - Audio3 Typ: Dolby AC3

2. Use the Up and Down buttons to select the audio type ("Dolby AC3", "Dolby E", "MPEG 1", "MPEG 2") on the PID chosen above, then press the Enter button.

Audio 4 PID
1. Use the Up and Down buttons to move the cursor to "Aud 4 PID," then press the Enter button.

   ![Serv Setup Menu]
   - Audio3 Typ: Dolby AC3
   - Aud 4 PID: 0x0028
   - Audio4 Typ: Dolby AC3

2. Use the Left and Right buttons to select the column to edit, then use the Up and Down buttons to select the desired Audio PID in the stream, then press the Enter button to save the PID.

Audio 4 Type
1. Use the Up and Down buttons to move the cursor to "Audio4 Typ," then press the Enter button.

   ![Serv Setup Menu]
   - Audio3 Typ: Dolby AC3
   - Aud 4 PID: 0x0028
   - Audio4 Typ: Dolby E

2. Use the Up and Down buttons to select the audio type ("Dolby AC3", "Dolby E", "MPEG 1", "MPEG 2") on the PID chosen above, then press the Enter button.

Auto Mode
This mode should only be used if no PID information is known about the stream.
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Auto Program

Note: This menu is only available if the "Tune Mode" is set to "Auto."

1 Use the Up and Down buttons to move the cursor to "Service," then press the Enter button.

2 Use the Up and Down buttons to select the desired Service number in the stream, then press the Enter button to save the selection.

SDI Audio Embedding

SDI Audio Embedding places decoded or pass through audio in the video horizontal space in one of 4 available locations. The 8 locations are Group 1 – pair 1 and pair 2, Group 2 pair 1 and 2, Group 3 pair 1 and 2, and Group 4 pair 1 and 2. To setup the assignment audio to one of the SDI audio embedding locations, use the following steps:

1 Start out at the home screen (where it shows the TS bit rate).
2 Press the Left button.
3 Use the Up and Down buttons to move the cursor to "Sdi Aud Embed," then press the Enter button.
4 The current settings are displayed. Press the Enter button again to edit the settings.
5 Use the Up and Down buttons to move the cursor to the pair location for the embedded audio. Group 1 "Pr1" or "Pr2," Group 2 "Pr1" or "Pr2", Group 3 "Pr1" or "Pr2," and Group 4 "Pr1" or "Pr2," then press the Enter button to edit the assigned audio.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6 Use the Up and Down buttons to select the audio that is assigned to the pair, "Off", "Aud 1 PCM", "Aud 1 Dig. Pass", "Aud 2 PCM," or "Aud 2 Dig. Pass", "Aud 3 PCM", "Aud 3 Dig. Pass", "Aud 4 PCM", "Aud 4 Dig. Pass." Press the Enter button to save the selection.

Audio 1 Setup

The following menus are used to setup the audio downmix settings.

Note: Refer to Appendix E - D9887B Receiver Audio Explanation (on page 311) for the D9887B receiver Audio Explanation.

Note: These settings do not apply to Dolby E audio.

Use the following instructions to setup Audio 1-4.

1 Use the Up and Down buttons to move the cursor to "Audio 1 Setup," then press the Enter button.

2 The current screen shows the status of the audio downmix settings, press the Enter button again to display the Edit screen.

Mode

1 Use the Up and Down buttons to move the cursor to "Mode," then press the Enter button.

2 Use the Up and Down buttons to select the desired downmix type ("Monitor", "Transmission", and User"), then press the Enter button to save the selection.

Note: The following are set for each Mode:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Compression</th>
<th>Downmix</th>
<th>Dynamic Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>Custom 1</td>
<td>2/0 LR</td>
<td>Disabled</td>
</tr>
<tr>
<td>Monitor</td>
<td>Line Mode</td>
<td>2/0 LR</td>
<td>Enabled</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Transmission</th>
<th>RF Mode</th>
<th>2/0 LtRt</th>
<th>Disabled</th>
</tr>
</thead>
</table>

Each Mode allows the following to be changed:

- User: Compression, Downmix, Dynamic Range
- Monitor: Compression
- Transmission: no changes

**Compression**

1. Use the Up and Down buttons to move the cursor to "Compress," then press the Enter button.

2. Use the Up and Down buttons to select the desired compression ("RF Mode", "Line Mode", "Custom 0", "Custom 1"), then press the Enter button to save the selection.

**Downmix**

1. Use the Up and Down buttons to move the cursor to "Ch Downmix," then press the Enter button.

2. Use the Up and Down buttons to select the desired downmix ("2/0 LR", "2/0 LtRt", "MonoChan1", "MonoChan2"), then press the Enter button to save the selection.

**Dynamic Range**

1. Use the Up and Down buttons to move the cursor to "Dyn Range," then press the Enter button.

2. Use the Up and Down buttons to set the Dynamic Range to "Enabled" or "Disabled," then press the Enter button to save the selection.
Active Errors

Whenever an error occurs on any of the four internal status indicators in the D9887B receiver, the Error LED will illuminate on the front panel and the details of the error will be listed in the Active Errors. An extensive listing of errors and their definitions is included in Appendix A - Error/Event List (on page 261).

Active Errors Display

To display the current errors on the unit, use the following steps:

1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "Active Errors," then press the Enter button.
3. Use the Up and Down buttons to scroll through the list of errors.
4. The active errors are listed. The "1-3" means RDS-Slot. In the example, the Dual MPEG over IP Input/UDP Output option card is not receiving packets, and is located in slot 1-3 (RDS 1, slot 3). "0" is used if the error is not related to an RDS (the "Fan Error" which is for the unit) or to a particular option card (the "No TS Present Error" which is for the decoder).
5. The Left and Right buttons can be used to scroll left or right if the error listing text cannot be entirely displayed on the front panel.
Event Log

The D9887B receiver has user selectable event logging that it stores to a list. The list includes the date and time of each event, a short description of the event, and which card was affected by the event. To configure the D9887B receiver to log specific events from a predefined list, use the steps below.

To setup and display the current errors on the unit, use the following steps:

1. Press the **Menu** button.
2. Use the **Up** and **Down** buttons to move the cursor to "Event Log," then press the **Enter** button to enter the "event Log Menu."

```
↑↓ Menu     ↓
  ► Event Log
  Splice Requests
  Pwd Strength
```

Event Logging Setup

**Note:** The Event Log List is dependent on the installed options.

To setup which events will log into the Event Log, follow the steps below:

1. Use the **Up** and **Down** buttons to move the cursor to "Event Logging Setup," then press the **Enter** button.

```
↑↓ Event Log Menu     ↓
  ► Event Logging Setup
  Event Log
```

2. Use the **Up** and **Down** buttons to select which event to turn enable or disable, then press the **Enter** button.

```
↑↓ Event Log List     ↓
  ► Vid Not Decode: On
  Vid Type: On
  Vid Unknown: On
```

3. Select either "On" or "Off," then press the **Enter** button.
Event Log Display

To display the current errors on the unit use the following steps:

1. Use the Up and Down buttons to move the cursor to "Event Log," then press the Enter button to choose which day to view.

2. Use the Up and Down buttons to move the cursor to choose either "current", "day 1 log", "day 2 log", or "day 3 log," then press the Enter button.

3. Use the Up and Down buttons to move the cursor to "display," and then press the Enter button.

4. Use the Up and Down buttons to scroll and view the whole event, and use the Left and Right buttons to move from one event to another. The "1/15" meant the first listed event of a total of 15 events.

Clear Error List

This clears the error log for the log that was selected, either the "current", "day 1 log", "day 2 log", or "day 3 log" error log.

1. Use the Up and Down buttons to move the cursor to "clear," and press the Enter button.
CAUTION: If "clear" is selected, all of the events that have been logged under the time selected will be erased from memory, and cannot be recovered.

The log selected will be listed followed by "has been cleared!."
Password Strength

Determines the password strength for access through the Web Client.

Character Type

If set to enable, the Web Client Password will contain at least three of the following classes: lower case letters, upper case letters, digits, or special characters.

To enable/disable Character Type password requirement, use the following steps:
1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "Pwd Strength," then press the Enter button.
3. Use the Up and Down buttons to move the cursor to "Char Type," then press the Enter button.
4. Use the Up and Down buttons to change the selection, then press the Enter button to save the selection.

Repeats

If set to enable, no character in the password can be repeated more than three times consecutively.

To enable/disable No Repeats password requirement, use the following steps:
1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "Pwd Strength," then press the Enter button.
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3 Use the **Up** and **Down** buttons to move the cursor to "Repeats," then press the **Enter** button.

4 Use the **Up** and **Down** buttons to change the selection, then press the **Enter** button to save the selection.

**Not User ID**

If set to enable, the password cannot be the same as the user ID or the user ID reversed.

To enable/disable Not User ID password requirement, use the following steps:

1 Press the **Menu** button.
2 Use the **Up** and **Down** buttons to move the cursor to "Pwd Strength," then press the **Enter** button.
3 Use the **Up** and **Down** buttons to move the cursor to "Not UID," then press the **Enter** button.

4 Use the **Up** and **Down** buttons to change the selection, then press the **Enter** button to save the selection.

**Not In List**

If set to enable, the password cannot be any of the following English words or these variants: reversed spelling, changed capitalization of the letters, 1 for i, | for i, ! for i, 1 for l, | for l, ! for l, 0 for o, or $ for s.

The following is a list of the words that are disallowed as passwords.

- admin
- decoder
- password
- transcoder
- user
- root
To enable/disable Not In List password requirement, use the following steps:

1. Press the **Menu** button.

2. Use the **Up** and **Down** buttons to move the cursor to "Pwd Strength," then press the **Enter** button.

3. Use the **Up** and **Down** buttons to move the cursor to "Not In List," then press the **Enter** button.

4. Use the **Up** and **Down** buttons to change the selection, then press the **Enter** button to save the selection.
Network Security

Network Security provides protection from unauthorized manipulation and configurations of an D9887B receiver when it is connected to the network.

HTTP

To enable/disable HTTP access to the D9887B receiver, use the following steps:

1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "Network Services," then press the Enter button.
3. Use the Up and Down buttons to move the cursor to "HTTP," then press the Enter button.
4. Use the Up and Down buttons to change the selection, then press the Enter button to save the selection.

HTTPS

To enable/disable HTTPS access to the D9887B receiver with, use the following steps:

1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "Network Services," then press the Enter button.
3. Use the Up and Down buttons to move the cursor to "HTTPS," then press the Enter button.
4. Use the Up and Down buttons to change the selection, then press the Enter button to save the selection.

SNMP

To enable/disable SNMP access to the D9887B receiver, use the following steps:

1. Press the Menu button.
2 Use the **Up** and **Down** buttons to move the cursor to "Network Services," then press the **Enter** button.

3 Use the **Up** and **Down** buttons to move the cursor to "SNMP," then press the **Enter** button.

4 Use the **Up** and **Down** buttons to change the selection, then press the **Enter** button to save the selection.

---

**SSH**

To enable/disable SSH access to the D9887B receiver, use the following steps:

1 Press the **Menu** button.

2 Use the **Up** and **Down** buttons to move the cursor to "Network Services," then press the **Enter** button.

3 Use the **Up** and **Down** buttons to move the cursor to "SSH," then press the **Enter** button.

4 Use the **Up** and **Down** buttons to change the selection, then press the **Enter** button to save the selection.

---

**ICMP**

To enable/disable ICMP access to the D9887B receiver, use the following steps:

1 Press the **Menu** button.

2 Use the **Up** and **Down** buttons to move the cursor to "Network Services," then press the **Enter** button.

3 Use the **Up** and **Down** buttons to move the cursor to "ICMP," then press the **Enter** button.

4 Use the **Up** and **Down** buttons to change the selection, then press the **Enter** button to save the selection.
Network Setup

The D9887B receiver can be setup on a network connection to allow remote management and SNMP configuration. For these features to work, the network settings for the D9887B receiver must first be configured properly for the network it is connected to.

Static IP Address

To setup the D9887B receiver with a static IP address, use the following steps:

1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "Network Interface," then press the Enter button.

   Insert menu options here.

3. Use the Up and Down buttons to move the cursor to "Set Default Gw Port," then press the Enter button.

   Insert menu options here.

4. Use the Up and Down buttons to move the cursor to "Default Gw," then press the Enter button.

   Insert menu options here.

5. Use the Up and Down buttons to change the selection to "Ctrl 1" or "Ctrl 2," then press the Enter button to save the selection.

   Insert menu options here.
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6 Use the Up and Down buttons to move the cursor to "Control 1" or "Control 2," then press the Enter button.

7 Use the Up and Down buttons to move the cursor to "DHCP," then press the Enter button.

8 Use the Up and Down buttons to change the selection to "off," then press the Enter button to save the selection.

IP Address/Subnet Mask/Gateway

1 Use the Up and Down buttons to move the cursor to "IP Address," then press the Enter button.

2 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the IP, then press the Enter button to save the selection.

3 The cursor will now be on "Subnet Mask."

4 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Subnet Mask, then press the Enter button to save the selection.

5 The cursor will now be on "Gateway."

6 Use the Left and Right buttons to select the column to edit and use the Up and Down buttons to change the Gateway, then press the Enter button to save the selection.
DHCP

The D9887B receiver can be configured to use DHCP to obtain an IP address/Subnet Mask/Gateway.

1 Use the Up and Down buttons to move the cursor to "Dhcp," then press the Enter button.

   Network
   →Dhcp: on
   IP Address
   10.0.0.50

2 Use the Up and Down buttons to change the selection to "on," then press the Enter button to save the selection.

   Note: It may take up to a minute for the D9887B receiver to obtain an IP address. During this time the unit will display a "busy" message next to DHCP.
Panel Lock

The D9887B receiver has the option to lock out the front panel with a user defined password. Follow the steps below to the D9887B receiver front panel. A Locked front panel prevents the user from changing any of the settings. All menu status displays are still available.

Locking

1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "Lock Panel," then press the Enter button.

Note: In order to lock the Front Panel, the unit must have a password. When Locking for the first time, user is prompted to enter a password. The message "No Password set. Please set Password" is displayed and the unit goes to the Set Password menu.

Set Password Menu

To set the password, use the following steps:
1. Use the Up and Down buttons to change the character and then the Left and Right buttons to move to the next character.
2. Press the Enter button when finished, to save the password. The unit goes to the Lock Menu.

Lock Menu

The current password is displayed.
1. To change the password, use the Up and Down buttons to move the cursor to the shown password and press the Enter button. The unit displays the Set Password Menu.
2 To lock the front panel, use the Up and Down buttons to move the cursor to "Lock Panel," and press the Enter button.

![Password Input]

Unlocking

1 Press the Menu button.
2 Use the Up and Down buttons to move the cursor to "Unlock Panel," then press the Enter button.

![Unlock Menu]

3 Use the Up and Down buttons to change the character and then the Left and Right buttons to move to the next character.

![Unlock Entry]

4 Press the Enter button to unlock the front panel.
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SNMP Configuration

The trap reporting to SNMP allows the user to set which traps will be sent. SNMP control of the D9887B receiver requires the unit to identify the "Community" for read only and read/write access. These are configured using the steps below.

To access the SNMP configuration, use the following steps:
1  Press the Menu button.
2  Use the Up and Down buttons to move the cursor to "SNMP," then press the Enter button.

RO Community Setup

To change the RO Community, follow the steps below:

Use the Up and Down buttons to move the cursor to "RO Community," then press the Enter button.

Name

1  Use the Up and Down buttons to select "Name," then press the Enter button.
2  Use the Up and Down buttons to change the character and then the Left and Right buttons to change the Name, then press the Enter button to save the selection.
Connection 1
1. Use the Up and Down buttons to select "Ip1," then press the Enter button.

![Up RO Community --.J]
Name: public
Ip1:010.000.015.010
Port1:0162

2. Use the Up and Down buttons to change the character and then the Left and Right buttons to change the IP address, then press the Enter button to save the selection.

3. Use the Up and Down buttons to select "Port1," then press the Enter button.

![Up RO Community --.J]
Name: public
Ip1:10.0.15.10
Port1:0162

4. Use the Up and Down buttons to change the character and then the Left and Right buttons to change the Port1 value, then press the Enter button to save the selection.

Connection 2
1. Use the Up and Down buttons to select "Ip2," then press the Enter button.

![Up RO Community --.J]
Port1:0162
Ip2:000.000.000.000
Port2:0162

2. Use the Up and Down buttons to change the character and then the Left and Right buttons to change the IP address, then press the Enter button to save the selection.

3. Use the Up and Down buttons to select "Port2," then press the Enter button.

![Up RO Community --.J]
Name: public
Ip2:0.0.0.0
Port2:0162

4. Use the Up and Down buttons to change the character and then the Left and Right buttons to change the Port 2 value, then press the Enter button to save the selection.

RW Community Setup
To change the RW Community, follow the steps below:
Use the **Up** and **Down** buttons to move the cursor to "RW Community," then press the **Enter** button.

**Name**

1. Use the **Up** and **Down** buttons to select "Name," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to change the character and then the **Left** and **Right** buttons to change the Name, then press the **Enter** button to save the selection.

**Connection 1**

1. Use the **Up** and **Down** buttons to select "Ip1," then press the **Enter** button.

2. Use the **Up** and **Down** buttons to change the character and then the **Left** and **Right** buttons to change the IP address, then press the **Enter** button to save the selection.

3. Use the **Up** and **Down** buttons to select "Port1," then press the **Enter** button.

4. Use the **Up** and **Down** buttons to change the character and then the **Left** and **Right** buttons to change the Port1 value, then press the **Enter** button to save the selection.
Connection 2

1. Use the Up and Down buttons to select "Ip2," then press the Enter button.

2. Use the Up and Down buttons to change the character and then the Left and Right buttons to change the IP address, then press the Enter button to save the selection.

3. Use the Up and Down buttons to select "Port2," then press the Enter button.

4. Use the Up and Down buttons to change the character and then the Left and Right buttons to change the Port 2 value, then press the Enter button to save the selection.
Genlock Reference

The Genlock Reference is only available when an MPEG-2/MPEG-4 4:2:0 D decoder is installed in the unit. This sets the video format of the reference video that is being used for Genlock.

To set the Genlock Reference on the unit, use the following steps:

1. Press the Menu button.
2. Use the Up and Down buttons to move the cursor to "Genlock Reference," then press the Enter button.

Setting Genlock Format

To set the Genlock reference format, follow the steps below:

1. Use the Up and Down button to move the cursor to "Format," then press the Enter button.

   |   |   |
---|---|---|
Off | 1080i | 29.97 |
NTSC | 29.97 | 1080i | 30.00 |
PAL | 29.97 | 1080p | 23.98 * |
720p | 50.00 | 1080p | 24.00 * |
720p | 59.94 | 1080p | 25.00 * |
720p | 60.00 | 1080p | 29.97 * |
1080i | 25.00 | 1080p | 30.00 * |

Note: The 1080p format selections are not available for the MPEG-2 Decoder 4:2:2 with Genlock (1 Video, 4 Audio) option.
SMPTE 333M Configuration

The D9887B receiver can be configured to output SMPTE 333M Closed Caption signals from the SMPTE 333M port on the back of the unit.

1. Press the **Menu** button.
2. Use the **Up** and **Down** button to move the cursor to "SMPTE 333M," then press the **Enter** button.
3. Press the **Enter** button one more time to edit "333M."
4. Use the **Up** and **Down** buttons to enable or disable SMPTE 333M, then press the **Enter** button to save the selection.
SCTE-35 to SCTE-104 Setup

The SCTE-35 to SCTE-104 is used in an application where the D9887B receiver is receiving a transport stream with SCTE-35 DPI splice messages. The D9887B receiver extracts those messages from the transport stream and converts them to SCTE-104 messages, and embeds them as VANC packets on the SDI output.

Enabling SCTE-35 to SCTE-104 Capabilities

This is enabled with a "SCTE 35/104" license, see Feature Licensing (on page 226). The license is enabled by entering a License Key and the status of the License is noted in the License "Feature List." The "SCTE 35/104" license is available whenever an MPEG-2/MPEG-4 4:2:0 Decoder (1 Video, 2 Audio) option is installed, and any of the Video Output (2 SD-SDI, 1 Composite), Video Output (2 HD-SDI, 1 RGBHV/YPbPr), or Dual Video Output (2 SDI, 1 RGBHV/YPbPr/Composite) output option card is installed in the D9887B receiver. The license enables the "SCTE 35/104" capabilities for the entire D9887B receiver.

When licensed, the "SCTE35 Setup" setting will be available.

Use the following steps to setup SCTE-35 to SCTE-104 conversion.

SCTE-35 PID

There are two modes that the SCTE-35 PID(s) can be entered in Auto or Manual. In Auto mode, the unit attempts to discover the SCTE-35 PID(s) as they are signaled in the stream. In Manual mode the user must enter the PID(s) manually using each PID’s HEX PID number. To setup the SCTE-35 PID(s), use the following steps.

1. Start out at the home screen (where it shows the TS bit rate).
2. Press the Left button.
3. Use the Up and Down buttons to move the cursor to "SCTE35 Setup," then press the Enter button.
4. Press the Enter button again to get to the edit screen.
Setting Mode
1 Use the Up and Down buttons to move the cursor to "Mode," then press the Enter button.

```
↓↑ SCTE35 → I
Mode: Auto
Heartbeat TO:10
```

2 Use the Up and Down buttons to select the desired mode of operation ("Auto" or "Manual"), then press the Enter button to save the selection.

Manual Mode

The following steps are only applicable to "Manual" mode.
1 Use the Up and Down button to select "PID 1," then press the Enter button.

```
↓↑ SCTE35 → I
Mode: Manual
Heartbeat TO:10
PID 1: 0x0015
```

2 Use the Left and Right arrows to select the column to edit and use the Up and Down arrows to enter the PID, then press the Enter button to save the selection.

Note: Use steps 1 and 2 above to enter the SCTE-35 PIDs for fields "PID 2" and "PID 3," if applicable.

SCTE-104 VANC Embedding

To setup the D9887B receiver to embed the SCTE-104 message into the SDI VANC, use the following steps:

1 Press the Output button.

2 Use the Up and Down buttons to move the cursor to the HD Video selection, then press the Enter button.

```
↓↑ Output → HD Video 2-1
HD Video 2-1
Audio 2-2
```

3 Use the Up and Down buttons to move the cursor to "SDI VANC Assignment," then press the Enter button.

```
↓↑ HD Video 2-1 → Video
Video
SDI VANC Assignment
Genlock Offset
```
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

4 Press the Enter button again to display the edit menu.

5 Use the Up and Down buttons to move the cursor to "SCTE 104 Msg," then press the Enter button.

6 Use the Up and Down buttons to choose "Enabled" or "Disabled," then press the Enter button to save the selection.

7 Use the Up and Down buttons to select "Line" for SCTE104 Msg and press the Enter button.

8 Use the Up and Down buttons to change the line number (4 – 15) in which the ancillary data will be located.
System Information

The unit information for D9887B receiver can be shown using the System menu. The system information contains the unit version, saving and loading of unit profiles (the configuration of the unit and its options), viewing the options that are installed in the unit, the unit temperature, and the unit time.

The System information is accessed using the following steps:
1. Press the Menu button.
2. Use the Up and Down button to move the cursor to "System," then press the Enter button.

Versions

This displays the unit’s software version and the software versions of options that have versions enumerated separately from the unit’s version.
1. Use the Up and Down button to move the cursor to "Versions," then press the Enter button.
2. The versions of the unit and its options are listed.

Profiles

This allows the user to save the configuration of the unit and its options. It also allows the user to load a previously saved profile or to delete a saved profile.
Chapter 4  Using the Front Panel to Configure the D9887B HDTV Modular Receiver

Use the Up and Down button to move the cursor to "Profiles," then press the Enter button.

![Navigation Menu]

Saving a Profile
1. Use the Up and Down button to move the cursor to "Save Current Profile," then press the Enter button.

![Profiles Menu]

2. Use the Up and Down buttons to change the character and then the Left and Right buttons to move to the next character.

![Profiles Menu with Name]

3. Press the Enter button when finished, to save the Profile.

Loading/Deleting a Stored Profile
1. Use the Up and Down button to move the cursor to the stored profile ("profile1" in the example), then press the Enter button.

![Profiles Menu with Profile1]

2. Use the Left and Right buttons to select "Apply" or "Delete," then press the Enter button.

![Profiles Menu with Apply and Delete]
Hardware

This lists the hardware of the unit and options that are installed along with the option slot locations (RDS-Slot). The "0" is used if the hardware is not related to a particular RDS or slot location. Slot "5" (either 1-5 or 2-5) is the AVPU (decoder) location.

1. Use the Up and Down button to move the cursor to "Hardware," then press the Enter button.

2. Use the Up and Down buttons to select a hardware unit and press the Enter button to see details about the selected hardware.

3. Use the Up and Down buttons to scroll up and down through the details. Press the Exit button to return to the Hardware list.

Temperature

This lists the temperature inside the D9887B receiver unit in both °C and °F.

1. Use the Up and Down button to move the cursor to "Temperature," then press the Enter button.

2. Press the Exit button to return to the System menu.
Time

Allows setting and displaying to the unit’s clock.

Use the Up and Down button to move the cursor to "Time," then press the Enter button.

Set Auto Update
1 Use the Up and Down button to move the cursor to "Auto Update," then press the Enter button.

2 Use the Up and Down button to select "Off" or "On," then press the Enter button to save the selection.

Display the Current Time
1 Use the Up and Down button to move the cursor to "Check Time," then press the Enter button.

2 Press the Exit button to return to the Time menu.

Manual Time Entry
1 Use the Up and Down button to move the cursor to "Manual Time Entry," then press the Enter button.
The following entries are shown for entry: "Month", "Day", "Year", Hour", and "Minute."

For each entry, use the **Up** and **Down** buttons to change the character and then the **Left** and **Right** buttons to move to the next character.

Press the **Enter** button to save the value and to move to the next entry.
Feature Licensing

Feature Licensing provides enabling advanced capabilities of the D9887B receiver options.

1. Click the **Menu** button.
2. Use the **Up** and **Down** buttons to select "System," and then press the **Enter** button.
3. Use the **Up** and **Down** buttons to select "License," and then press the **Enter** button.

![Menu Options]

To View the Current Licensing

To view your current licenses select "Feature List," and then press the **Enter** button.

![Feature List]

To Enter the License Key

1. To enter a new license key press the **Enter** button when "Key Entry" is selected.
2. Use the **Up** and **Down** buttons to edit the character and use the **Left** and **Right** buttons to move to the next character. Press the **Enter** button when finished.

![Key Entry]

**Note:** If you incorrectly enter the license key, you can go back and try again.

**Note:** A reboot will be required when the D9887B receiver has finished saving the settings.
Overview

This chapter describes how to navigate through the configuration menus on the web client of the D9887B receiver.

Note: All instructions in this manual are based on unit software 7.3.x. Newer versions of software, when released, may operate slightly different in regards to menus and configuration.

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Login

To login to the remote web client for the D9887B receiver, use the following steps:

1. Open an Internet Explorer browser window or a Firefox browser window, then type the IP address of the D9887B receiver into the address box and press Enter.

2. Select either the "admin (read-write)" or "user (read-only)" Username, and enter the associated password. Press the Login button to log into the D9887B receiver.

Note: The IP address of the D9887B receiver can be found from the front panel "Network Setup" settings, see Network Setup (on page 207).

Note: By default, there is no password.

Note: If the password was changed (see Web Passwords (on page 248)) it can be recorded in the provided space below.

Password: __________________________
Status Indicators

Once logged into the web client, there are many things to take note of. The first things are the four status indicators along the top of the screen.

![Status Indicators Image]

These indicators directly reflect the two status LEDs on the front panel. A green LED means the status of that object is good and a red LED means that the status of that object is in error. If any of the indicators are red, a more detailed explanation is provided by clicking on the Unit tab and looking under the first section, "Error List."

Refer to Appendix A - Error/Event List (on page 261) for a more detailed explanation of the individual errors.
Configuration

When setting up the D9887B receiver using the web client, some of the same things apply to the front panel. In a Configuration 2 unit, RDS1 and RDS2 are differentiated in the first two tabs. To setup the Input, Services, and Output, use the steps in the following sections.

Input Setup

To set the desired input as active, use the following steps:

1. Click on the RDS 1 or RDS 2 tab of the corresponding RDS that needs to be configured.
   
   **Note:** In a Configuration 1 D9887B receiver, there will only be a RDS 1 tab.

2. Click the **Enable** button on the same line as the input you wish to make active.

<table>
<thead>
<tr>
<th>Edit</th>
<th>Module</th>
<th>Slot</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASI/310M</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MPEG/IP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   **Note:** The input is already active if the button looks like this: ![Enable](image)

3. A dialog box will appear asking "Are you sure you want to change the active input?" Click **Yes** to approve the action.
4 Once the desired input has been set to active, the specific options of that input card can be set by clicking on the **Window** icon next to the active input. When the **Window** icon is clicked, an edit window will appear with the specific options for that card. Use the drop down menus and input boxes to complete the edit form. Click the **Apply** button at the bottom of the form to save the settings. The current settings for any of the input cards can be verified by clicking on the **Down** button next to the desired input.

![Edit Window](image_url)

**Services Setup**

After the desired input has been selected and configured, the session needs to be setup.

All of the following options can be found under the "Services" menu.

**Services**

The "Services" edit menu defines which program is going to be decoded. These can be setup in four different ways depending upon the application. The four different setup options are: "Auto", "PID-Locked", "Priority", and "No PSI." Auto mode should only be used if nothing is known about the PIDs in the TS. Priority mode is primarily used for redundancy. PID-Locked mode should always be used unless one of the above conditions is true. No PSI mode should only be used for streams that do not contain any PSI information. To setup these decoder settings use the following steps:

1. Click on the **RDS 1** or **RDS 2** tab of the corresponding RDS that needs to be configured.

   **Note:** In a Configuration 1 D9887B receiver, there will only be a **RDS 1** tab.
2 Under the "Services" heading, click on the Window button next to "Services."
3 A new window should pop up in the middle of the screen. Use the drop-down menu at the top to choose the appropriate setup type.

4 In the section on the right, there is a list of services detected in the stream and an Expand button to the left of each service.
5 Click the Expand button to view the contents of each service.
6 You can then drag and drop the PID values by simply clicking and holding them as you drag the PID value to the appropriate box in the section on the left.
7 Fill in the remaining input boxes, then click the Apply button to save the settings.

   In PID-Locked mode, all of the entries should be entered as PIDs.
   In Auto mode, the program number should be entered as the number of the program in the TS.
   In Priority mode, the service number is entered and the audio entries should be entered as the number they are indexed by, in the TS.
   In No PSI mode, all of the entries should be entered as PIDs with their corresponding data type.

   Note: Selecting a service (program) with drag and drop will also fill in the associated audio programs in the service entry fields.

Audio Status and Downmix Settings

The audio downmix settings have three different configuration settings. These three are: transmission, monitor, and user. To configure the audio downmix setting, use the following steps:

1 Click on the RDS 1 or RDS 2 tab of the corresponding RDS that needs to be configured.

   Note: In a Configuration 1 D9887B receiver, there will only be a RDS 1 tab.
2 Under the "Services" heading, click on the **Window** button next to the corresponding audio to configure.

3 A new window should pop up in the middle of the screen. Use the drop-down menu at the top to choose the appropriate "AC3 Downmix Mode."

4 Depending on the chosen Mode, use the remaining drop-down menus to finish the setup.

5 Click the **Apply** button to save the settings.

   **Note:** Use the previous steps to setup the other audio downmixes as well.

   **Note:** "Transmission" Mode does not allow any changes. "Monitor" Mode allows changing the "Compression" value. "User" Mode allows changing "Compression", "Channel Downmix", and "Dynamic Range" values.

**Source ID**

To setup the Source ID, use the following steps:

1 Click on the **RDS 1** or **RDS 2** tab of the corresponding RDS that needs to be configured.
2 Under the "Services" heading, click on the Window button next to the Source ID option.

3 A new window will pop up in the middle of the screen. Use the drop-down menu at the top to choose the "Lookup Mode."

4 Use the next drop-down box to choose the desired "ID Timeout" (in seconds).

5 Enter a "Manual Station Name," and then click the Apply button to save the changes.

   Note: If no source is found in the allotted time, the "Manual Station Name" is displayed.

**SCTE-35 to SCTE-104 Setup**

To select the PIDs for SCTE 35, follow the steps below.

1 Click on the RDS 1 or RDS 2 tab of the corresponding RDS that needs to be configured.

2 Under the "Services" heading, click on the Window button next to the "SCTE35" option.

3 Set the "PID Detection Mode" to either Auto or Manual.

4 Enter the "Heartbeat Timeout" in minutes.

5 If Manual is selected in the above drop-down box, "PID 1", "PID 2", and "PID 3" can be set as the PIDs that the D9887B receiver will monitor for SCTE35 events.
Note: If Manual PID Detection Mode is selected, the following boxes become available to configure: PID 1, PID 2, and PID 3.

Note: If Auto mode is selected, the D9887B receiver will pick the first three DPI PIDs in the PMT’s registration descriptor to monitor for SCTE35 events.

**SCTE-104 Splice Requests**

To setup SCTE-104 Splice Requests, follow the steps below. The SCTE-104 Splice Requests are available for the GPIO Module option (8713).

**Note:** Up to 4 SCTE-104 Splice Requests can be set up at one time. Use the tabs at the top of the editor to configure a different Splice Request.

1. Click on the **RDS 1** or **RDS 2** tab of the corresponding RDS that needs to be configured.
2. Under the "Services" menu, click on the Window button next to the "SCTE104 Splice Requests" option.

3. Enter the "AS Index" if one is present, otherwise leave blank (0). It ranges from 0 to 255 and uniquely identifies the source of the message.
4. Enter the "DPI PID Index" to specify the index to the DPI PID that will carry the splice_info_sections. It ranges from 0 to 65535 and is important when there are multiple DPI PIDs referenced by the PMT of one MPEG program.
5. Use the "Splice Insert Type:" drop-down menu to select "Start Normal", "Start Immediate", "End Normal", "End Immediate", or "Cancel."
6. The "Splice Event Source" is a user assigned value for the source of the cue message.
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7 In the next "Unique Program ID" box, enter the unique program ID. It ranges from 0 to 65535 and is a unique identification for a viewing event in the service.

8 In the box to the right of "Pre-Roll Time," enter the desired amount of time, in milliseconds.

9 Insert the "Break Duration" in tenths of seconds. It ranges from 0 65535. If the default, 0, is chosen, the Injector will not set a duration. This value is ignored if "Splice Insert Type" is anything other than "Start Normal" or "Start Immediate."

10 The "Avail Num" field provides an authentication for a specific avail in the current "Unique Program ID." It ranges from 0 to 255. If left at default, 0, non-usage will be assumed.

11 The "Avails Expected" indicates the specific number of individual Avails expected within the current viewing event. It ranges from 0 to 255. If left at its default, 0, "Avail Num" is assumed to have no meaning.

Note: Using the front panel (see GPIO Module (on page 107)) uses the following names for the Splice Requests:

- "Splice Event Source" for "Event Source"
- "Program ID" for "Unique Program ID"
- "Preroll" for "Pre-Roll Time"
- "Avail Expect" for "Avails Expected"
- "Splice Type" for "Splice Insert Type," with values:
  - "OON" for "Start Normal"
  - "OON Imm" for "Start Immediate"
  - "RTN" for "End Normal"
  - "RTN Imm" for "End Immediate"

Output Setup

All of the installed output option cards are listed under the "Outputs" heading. This section includes the options for the installed output cards (e.g. Video, Audio).

Each output card can be configured by clicking on the Window button that is next to it. When the Window button is clicked, it will bring up another window, in the middle of the screen, with the specific options for that card. Use the drop-down menus and input boxes to complete the edit form. Click the Apply button, at the bottom of the form, to save the settings. The current settings for any of the output cards can be verified by clicking on the Down Arrow button next to the desired output.
PSIP Information

To view the PSIP information for the applied TS, select the RDS (RDS 1 or RDS 2) and then click the View PSI Tables button which is located right next to the "Inputs" heading towards the top of the page.

This will open a new window that displays all of the PSIP information for the applied TS. The PSIP Tables are grouped into "MPEG", "ATSC", and "DVB" tables. The table groups are selected using the selection radio buttons: MPEG, ATSC, or DVB.

The MPEG table grouping includes displaying the PAT, PMT or CAT. Click the tabs at the top of the window to view the corresponding table.

The ATSC table grouping includes displaying the MGT, TVCT, EIT or STT. Click the tabs at the top of the window to view the corresponding table.

The DVB table grouping displays the SDT.
The PSIP Table display window can be resized to fit the table being displayed. Scroll bars allow displaying the parts of the table that do not fit in the window.

The displayed table is not automatically updated if the content changes. Use the Refresh button to update the table display. Changing tables will also display the current table information.

In order to close the PSIP table display window, use the Close button.
Unit

This section describes the information included under the Unit tab.

Active Errors

The Active Errors parameter provides a detailed description of specific errors and the location of the item producing the error.

Event Logging

This parameter shows all the possible events that the D9887B receiver will log. Follow the steps below to enable or disable an event.
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1  Click the **Window** button under the "Event Logging" heading. This will bring up a new edit form in the middle of the screen.

![Event Settings Editor](image1)

2  Choose either the "General, Video, Audio, DPI, or System" tab to enable or disable events under those headings.

3  Click the **Apply** button at the bottom of the form to save the settings.

**Unit Date/Time**

This section provides an overview of how to configure the date and time of the unit.

1  Click the **Window** button under the "Unit Date/Time" heading. This will bring up a new edit form in the middle of the screen.

![Date/Time Editor](image2)

2  Use the drop-down menu to select either "Auto" or "Manual."

3  If "Auto" is selected, the option to use a time server is available. Enter the IP address of the Time Server in the space provided.

4  Click the **Apply** button to save the changes.
5 If "Manual" is selected, click the Calendar button to choose the date.

6 Enter the time manually in the space provided.
7 Click the Apply button to save the changes.

SNMP MIB Modules

In order to control the D9887B receiver using SNMP, the MIB modules need to be downloaded. The Sencore specific MIB modules are displayed under the "SNMP MIB Modules" heading. The generic MIB modules can be viewed and downloaded by clicking on the "View All MIB Modules..." hyperlink. That will bring up a new window displaying all the generic MIB modules. To download these, right-click on the desired MIB module under the "SNMP MIB Modules" heading and select "Save Target As..."

SNMP Settings

The next section is the SNMP settings. This section gives an overview of all the SNMP settings as well as the configuration of SNMP. To edit the SNMP settings, use the following steps:
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1  Click the **Window** button under the "SNMP Settings" heading. This will bring up a new edit form in the middle of the screen.

![](image)

2  Use the drop-down menus and input boxes to configure SNMP to the desired settings.

3  At the top of the edit form, there are five drop-down menus for enabling or disabling five separate SNMP traps as well.

4  When all of the settings have been configured, click the **Apply** button to save the settings.

### SMPTE-333M

To enable SMPTE333M, use the following steps:

1  Click the **Window** button next to the SMPTE333M title. This will bring up a new edit form in the middle of the screen.

![](image)

2  Use the drop-down menu to enable or disable SMPTE333M.

3  Click the **Apply** button to save the settings.
Profiles

Profiles are the means for saving and applying a group of settings on an D9887B receiver for a particular use. By applying a particular profile, the user can recall the settings of the D9887B receiver for different demodulation and decoding needs.

Up to 24 different profiles can be stored on an D9887B receiver. New profiles can be added to the unit by configuring the various settings of the D9887B receiver, then saving this profile and giving it a name. New profiles can also be added to an D9887B receiver by transferring them from a PC via the web client interface. Profiles can be deleted, by name, to make room for others. To configure profiles, first click on the Admin tab to display the profiles section.

Saving a Profile

Once the D9887B receiver is configured as required for a specific use and environment, the settings can be saved to the D9887B receiver by a named profile. To save a profile, use the following steps:
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1  Click the **Save** button.

![Profiles interface]

2  Enter a name for the profile.

![Save Profile dialog]

**Note:** The profile name should be no more than 15 characters long.

3  Click the **OK** button to save the profile.

4  Click the **Close** button after the profile has been successfully saved.

### Deleting a Profile

If a given profile is no longer needed or more space is needed on the D9887B receiver for more profiles, it may be necessary to delete a profile. To delete a profile, use the following steps:

1  Use the drop-down menu to select the profile to be deleted.

![Profiles interface]

2  Click the **Delete** button.
3 A dialog box will appear and ask, "Are you sure you want to delete this profile?." Be sure to check the profile name in the drop-down box because that is the profile that will be deleted.

4 Click the Yes button in the dialog box to confirm the delete.

5 After the profile has been deleted, click the Close button to close the dialog box.

Renaming a Profile

If a particular profile’s name needs to be changed for one reason or another, use the following steps to change the name of the profile:

1 Use the drop-down menu to select the profile to be renamed.

2 Click the Rename button.

3 A dialog box will appear that has the current name of the profile in it. Type a new name for the profile in the input box.

4 Click the OK button in the dialog box to confirm the rename.

5 After the profile has been renamed, click the Close button to close the dialog box.
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Applying a Saved Profile

Once one or more profiles have been saved in the D9887B receiver, it is possible to apply any of the saved profiles. When the selected profile is applied, the settings that were saved in that profile will now be applied. To apply a saved profile, use the following steps:

1  Choose the desired profile from the drop-down menu.

![Profiles dropdown menu]

2  Click the Apply button.

![Applying Profile...]

3  It may take up to a minute to apply the new profile. When the profile has been successfully loaded, click the Close button to close the dialog box.

Viewing a Saved Profile

To view the settings contained in a saved profile choose the desired profile from the drop-down list, then click the View button. A new window will appear with all of the settings contained in that profile.

Downloading a Saved Profile

The D9887B receiver is capable of downloading a saved profile to a local computer. This option can be extremely useful if more than 24 profiles are needed. Since only 24 profiles can be stored on the D9887B receiver, new profiles can be created on the unit and then downloaded to the local computer. To download a profile from the D9887B receiver, use the following steps:
1 Choose the desired profile from the drop-down menu.

2 Click the Download button.

3 A new dialog box will appear and ask what to do with the file. Click the Save button and then point to a location on the local computer.

4 Click the Save button again.

**Uploading a Saved Profile**

When a saved profile on a local computer is needed, it is necessary to upload that profile back to the D9887B receiver. To upload a profile, from a local computer, back to the D9887B receiver, use the following steps:

1 Click the Upload button.

2 A new window will appear with a space to provide the path of the profile to upload. Click the Browse button and navigate to the location of the profile on the local computer. Select the file and then click Open.

3 The file path box should now be filled in with the location of the profile. Click the Upload button.
Web Passwords

The password on the web client for the admin account and user account should be changed to something other than the default passwords. The process is the same for both the admin account and the user account, just click on the Window button next to the account of the password to change. To change either the admin account password or the user account password, use the following steps:

1. Click on the **Window** button next to the account to edit.

2. A new window will appear in the middle of the screen. Type the new password in both of the fields and then click the **Apply** button to save the new password.
Password Strength

If desired, the password strength for the web client can be increased from the default value. To change the password strength required, click on the **Window** button in the Password Strength Section. To change any of the password strength settings:

1. Click on the **Window** button in the Password Strength Section to edit.

A new window will appear in the middle of the screen. Change the settings desired and then click the **Apply** button to save the settings.
Network Services

If desired, the Network Security can be increased from the default value by disabling any or all of the Network Services. To change any of the network services, click on the Window button in the Network Services section. To change any of the network service settings:

1. Click on the Window button in the Network Services section to edit.

Network Services

- HTTP (TCP, Ports 80/8080): Enabled
- HTTPS (TCP, Ports 443/4430): Enabled
- SNMP (UDP, Port 161): Enabled
- SSH (TCP, Port 22): Enabled
- ICMP (ping): Enabled

2. A new window will appear in the middle of the screen. Change the settings desired and then click the Apply button to save the settings.
Reset Unit

If a problem should ever arise where the D9887B receiver has locked up, or malfunctioned in some manner, it is possible to perform a soft reset from the web client. A soft reset will reboot the D9887B receiver and hopefully take care of any previous problems the unit was exhibiting. A soft reset will not change any setting. To perform a soft reset, use the following steps:

1. Click the "Reset Unit" hyperlink under the "Reset Unit" heading.

2. A new dialog box will appear asking "Are you sure that you want to reset the unit?" Click the Yes button to reset the unit.

Caution: Resetting the unit is a service affecting event and service will be interrupted while the unit is rebooting.

3. A progress bar will appear on the screen as the unit is resetting. It may take up to 5 minutes for the D9887B receiver to restart depending on the configuration.

4. Once the unit has restarted, the web client will be redirected back to the login page for the D9887B receiver.
Software Updates

Occasionally Cisco will release new software for the D9887B receiver to provide new features and bug fixes. NEVER PERFORM A SOFTWARE UPDATE UNLESS INSTRUCTED TO DO SO BY A CISCO REPRESENTATIVE. If an update is warranted, the representative will provide the software and instructions for the update.
Diagnostics

Processes

This section is primarily used by a Cisco representative to aid in troubleshooting a problem. By clicking on the "View Processes Window..." hyperlink, under the "Diagnostics" heading, it will bring up a new window that shows all the running processes of the D9887B receiver’s operating system. There are no user-definable parameters under this menu.

Network Interface Information

This section displays detailed information about the network portion of the D9887B receiver. It also allows a new IP address to be set in the unit. To set a new IP address, use the following steps:

Warning: Use caution when changing IP settings or the unit may be rendered unreachable.

1. Click the "View Network Interface Window..." hyperlink, under the "Diagnostics" heading.
2 A new window will appear in the middle of the screen. This new window will give all of the details for the network interface of the D9887B receiver, as well as contain three input boxes to set a new IP address.

3 Fill in the three fields, "IP Address", "Subnet Mask", and "Gateway."

4 Click the **Apply Network Settings** button to save the network settings.

**Note:** If the Backup Network Controller is installed, the Network Viewer will be replaced with a Network Settings window.
Under the About tab, there are no user definable parameters but there is information about how to contact Cisco, as well as information about the software versions on the unit, and which option cards are installed.
Feature Licensing

The Web Client is the easiest way to upgrade the licensing on the D9887B receiver. The following licenses are available for the options (if restricted to only certain installed options):

- "SCTE 35/104" – conversion of SCTE35 to SCTE 104 VANC packets – Not for the MPEG-2 Decoder 4:2:2 with Genlock (1 Video, 4 Audio) option, needs SDI output option (see SCTE-35 to SCTE-104 Setup (on page 218))

- "h.264" – so it can decode MPEG4/H.264

- "Advanced Satellite Features" – allows multistream, VCM, 16APSK and 32APSK – Qad Input DVB-S Receiver with LNB option

Login to the D9887B receiver Remote Web Client as an administrator, and then click the Admin tab. The first section under this tab is "Feature Licensing". The unit’s options determine the licenses that are applicable to the unit, in the example "h.264" is listed as well as "SCTE35/104" each followed by either "Enabled" or "Disabled." If all listed features are "Enabled," you do not need to upgrade the licensing.

When a license is upgraded, the entire D9887B receiver unit and all of the options that support the licensed features can now support the additional feature capabilities.

Follow these steps to upgrade

1. Click on the Window button on the left under "Feature Licensing."

2. Enter your newly acquired license key in the space provided, and then press the OK button.
3 When the D9887B receiver is finished saving the settings, a reboot will be required.

![Image: Please Wait dialog box showing changes have been saved and the webpage is updating.]
Customer Information

If You Have Questions

If you have technical questions, call Cisco Services for assistance. Follow the menu options to speak with a service engineer.

Access your company's extranet site to view or order additional technical publications. For accessing instructions, contact the representative who handles your account. Check your extranet site often as the information is updated frequently.
Appendix A

Error/Event List

Introduction
This appendix contains a list of errors and events in the D9887B receiver.

In This Appendix

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Error or Event List

General

- **Bitrate Error** - The TS bitrate is not within 100 bps of 19.392 Mbps while using the 310M card, or it is greater than 160 Mbps while using ASI.

- **Tuner Lock Error** – The FEC is not synchronized. Data on carrier is not synchronized.

- **Video Unsupported Profile/Level** - The video is not of a supported profile/level.

- **Carrier Lock Error** - Cannot detect the carrier signal.

- **TS Rate Invalid** - A burst of packets caused the receive FIFO to overflow.

- **Not Receiving Packets** - The card is not receiving IP packets within 1 FEC period (1 second).

- **No TS Present Error** - There is no sync byte (0x47) found in a 1 second period.

- **Transport Packet Error** - There was an error in the transport stream.

- **Lock Error** - A carrier cannot be found.

- **Low MER** - The MER is lower than the threshold set by the user.

- **Low Level** - The signal level is lower than the threshold set by the user.

- **System Time Event** – If the unit is powered on/off, the time is manually updated, or the time server is invalid, this event will be triggered.

- **CA Service Not Found** - The CAM is configured to use selected PIDs, but the selected PID is no longer available in the PMT.

- **Program Not Found** – The Program / Service that is selected is not available.

- **Band Frequency Error** – The Satellite Receiver tuning using Frequency and Offset is not within the Receiver’s tuning range.

- **FP Login Error Event** – There was an attempt to unlock that front panel using the wrong password.

- **Uncorrectable FEC Error Event** – There was an FEC error that was uncorrectable.

- **Corrected FEC Error Event** – There was an FEC error that was corrected.

- **Out of Order Packet Error Event** – The IP connection has received an out of order packet that is not able to be restored to its correct order.
**Duplicate Packet Error** – The IP connection has received a duplicate packet that was discarded.

**Not Receiving IP Packets Error** – An incoming IP connection is no longer receiving any packets.

**IP TS Sync Loss Error** – An incoming IP connection has lost its TS synchronization, and it could still be receiving packets.

**DMIP Failover Backup Error** – The 8727 IP backup IP Receive Group is now being used as the Active Receive Group.

**DMIP Temperature Error** – The 8727 has exceeded its normal operating temperature limit.

**Input Switched to Backup Error** – The Backup input option has replaced the Primary input option as the active input.

**Line Conflict** – An SDI output VANC line has conflicting data trying to be placed on the same line.

**FEC Error Counter Rollover Event** – The FEC error counter has restarted at 0.

**FEC Error Counter Reset Event** – There has been an FEC counter reset, setting all of the FEC counters for the input option to 0.

**AFD Code Not Present Event** – The unit is configured to use or embed the AFD code in the VANC, and the AFD code is not present with the input video.

**Video**

**Video Not Decoding Error** – The decoder did not receive a new video frame within 3 seconds.

**Video Type Error** - Selected video stream format is not supported by the decoder.

**Video Unknown Error** – Video Decoder does not recognize the video stream.

**Video Conversion Error** - The video stream cannot be converted.

**Invalid Output Format Error** - The output format selected is invalid for the combination of incoming stream and output card.

**Incompatible Genlock Error** - The Genlock Reference selected by the user is incompatible with the incoming stream format.

**Genlock Reference Error** - The Genlock reference is set but there is no reference signal detected.

**SD Down-Conversion Error** – The conversion to an SD output format from HD failed because the HD frame rate is not 29.97 (for NTSC) or 25 / 50 (for PAL).
Appendix A
Error/Event List

- **4:2:2 Conversion Error** – Generated when chroma format is 4:2:2 and the native resolution is 1080 and the output is 720, video scaling is not possible.

- **Video No Sync Error** – The video synchronization is not taking place due to the large difference between the PTS and PCR (> 6 seconds).

---

**Audio**

- **DolbyE Not Decoding Error** - The DolbyE PID has been set but is not being decoded.

- **Audio (N) Not Decoding Error** - Audio Decoder (N) didn’t receive a new audio frame within 3 seconds.

- **Audio (N) Unknown Error** - Audio Decoder (N) does not recognize the audio stream.

---

**System**

- **Fan Error** - The fan is spinning at less than 500 RPM.

- **Temperature Error** - The internal temperature has exceeded 70 Celsius.

- **DPI Stream Type Locked Error** - User is not licensed to decode the selected stream.

---

**DPI**

- **SCTE104 GPI Event** - I2C failed to write to the splice request data to the decoder.

- **SCTE104 LAN Event** - I2C failed to write to the splice request data to the decoder.

- **SCTE35 Event** - Parsed transport stream and event was fired.

- **SCTE35 GPO Event** - Relay configured by user to have an SCTE35 trigger and an SCTE35 splice_insert message was received.

- **SCTE35 to SCTE104 Event** - Although a number of things can trigger this event, one example is: The decoder received an SCTE104 splice_request_data message but failed to embedded it in the VANC because either an embedder was not available or the ADP packet was too large for the number of available lines.

- **SCTE35 Heartbeat Event** - Have not received an SCTE35 message for a user specified period of time (default 10min).
Introduction

This appendix contains the technical specifications for the D9887B receiver.

Note: The technical specifications are subject to change without prior notice.
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## D9887B receiver – base unit

<table>
<thead>
<tr>
<th>Includes:</th>
<th>Display, keypad, embedded controller, Chassis/case, Power Supply/line cord</th>
</tr>
</thead>
</table>

### System –

<table>
<thead>
<tr>
<th>Display type:</th>
<th>VFD (Vacuum Fluorescent Display)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Configuration:</td>
<td>4 lines x 20 characters</td>
</tr>
<tr>
<td>Keypad:</td>
<td>Membrane switches</td>
</tr>
<tr>
<td>Front Panel Lockout:</td>
<td>Password control, up to 10 alpha-numeric characters (no punctuations or spaces allowed)</td>
</tr>
<tr>
<td>Configurations Allowed:</td>
<td>Single RDS – 8-Slot (Configuration 1)</td>
</tr>
<tr>
<td></td>
<td>Dual RDS – 4-Slot each RDS (Configuration 2)</td>
</tr>
<tr>
<td>Rear panel:</td>
<td>Eight available slots</td>
</tr>
<tr>
<td></td>
<td>Six I/O interface slots</td>
</tr>
<tr>
<td></td>
<td>Two video output slots (Configuration dependent)</td>
</tr>
</tbody>
</table>

### Remote Operation/Update Interface –

| Type: | Ethernet, 10/100 |
| Rear panel indicators: | Link (Green LED), Activity (Amber LED) |
| Connector: | RJ45 |

### Serial Remote operation interface –

| Type: | RS232 |
| Protocol: | 115, 8, N, 1 |
| Connector: | 9-pin D-sub, male |

### Front Panel Indicators –

| Input LED: | Green indicates valid input on selected input |
| | Off indicates no valid signal on the selected input |
| | Constant Blinking Green for Configuration 2 units indicates one valid input and one invalid input |
| Error LED: | Red indicates error is occurring |
| | Off indicates no errors detected |

### AC Power –

| Operating Voltage: | 95–135 VAC or 180–265 VAC |
### Max Power:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max</td>
<td>200 W</td>
</tr>
</tbody>
</table>

### Current Draw/Power:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical 1 Decoder with 4 option cards</td>
<td>0.40 A / 50 W</td>
</tr>
<tr>
<td>Typical 2 Decoders with 8 option cards</td>
<td>0.60 A / 70 W</td>
</tr>
</tbody>
</table>

### Frequency:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47–63 Hz</td>
</tr>
</tbody>
</table>

### Connector:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IEC C14</td>
</tr>
</tbody>
</table>

### Line Cord:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Detachable, 6 foot, 3-prong</td>
</tr>
</tbody>
</table>

### DC Power -

### Operating Voltage:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 – 60 VDC</td>
</tr>
</tbody>
</table>

### Max Current Draw/Power:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical 1 Decoder with 4 option cards</td>
<td>1.04 A / 50 W</td>
</tr>
<tr>
<td>Typical 2 Decoders with 8 option cards</td>
<td>1.46 A / 70 W</td>
</tr>
</tbody>
</table>

### Connector:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tyco Amplimite 109 series 3C3</td>
</tr>
</tbody>
</table>

### Line Cord:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Detachable, 5 ½ foot</td>
</tr>
</tbody>
</table>

### General -

### Operating Temperature:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to 45 degrees C</td>
</tr>
</tbody>
</table>

### Operating Humidity:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 95% Non-Condensing</td>
</tr>
</tbody>
</table>

### Cooling:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Forced air, front intake, rear exhaust</td>
</tr>
</tbody>
</table>

### Temperature monitor:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fan failure, internal temperature sensor</td>
</tr>
</tbody>
</table>

### Size:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Height – 1RU (1 ¾”), Width = 19”, Depth = 19”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19” rack mountable, with removable ears</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rack clips and screws included</td>
</tr>
</tbody>
</table>

### Weight:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9.5 lbs. (base unit)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.75 lbs. (fully loaded)</td>
</tr>
</tbody>
</table>

### Pollution Degree:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

### Installation Category:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>II</td>
</tr>
</tbody>
</table>

### Grounding Post:

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On chassis</td>
</tr>
</tbody>
</table>
### 8VSB/QAM Receiver Option

<table>
<thead>
<tr>
<th>RF Input -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency Range:</strong></td>
<td>50-850 MHz</td>
</tr>
<tr>
<td><strong>VHF/UHF (Ch2 – Ch69)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CATV (Ch2 – Ch134)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CATV Offsets:</strong></td>
<td>FCC, IRC, HRC</td>
</tr>
<tr>
<td><strong>Sensitivity:</strong></td>
<td>-15 dBmV</td>
</tr>
<tr>
<td><strong>Dynamic Range:</strong></td>
<td>&gt; 35 dB</td>
</tr>
<tr>
<td><strong>Modulation:</strong></td>
<td>8VSB, QAM-B</td>
</tr>
<tr>
<td><strong>Connector:</strong></td>
<td>F-81 Type, panel mount, female</td>
</tr>
<tr>
<td><strong>Impedance:</strong></td>
<td>75 ohms</td>
</tr>
<tr>
<td><strong>MER:</strong></td>
<td>Accuracy: +/- 1 dB</td>
</tr>
<tr>
<td><strong>Range:</strong></td>
<td>0 – 35 dB – 38 dB (QAM 256)</td>
</tr>
<tr>
<td><strong>Low limit flag:</strong></td>
<td>User defined</td>
</tr>
<tr>
<td><strong>Input Level Flag:</strong></td>
<td>Range: -15 dBmV to +20 dBmV</td>
</tr>
<tr>
<td><strong>Accuracy:</strong></td>
<td>+/-5 dB</td>
</tr>
<tr>
<td><strong>Low flag limit:</strong></td>
<td>User defined</td>
</tr>
</tbody>
</table>

### QAM -

| **Standard:** | ITU-T, Annex B (SCTE DVS-031) |
| **QAM Mode:** | 64 and 256 |
| **De-interleaver:** | I=1-128, J=128/1 |
| **Nyquist Roll Off (Alpha):** | 12%, 18% |

### 8VSB -

| **Standard:** | ATSC A/53E |
| **Decoding Levels:** | 8 |
| **Nyquist Roll Off (Alpha):** | 11.5% |
## Serial TS Input/Output (DVB-ASI / SMPTE 310M)

### Option

<table>
<thead>
<tr>
<th></th>
<th>ASI or 310M, selectable (Not simultaneously)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configuration:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Connector:</strong></td>
<td>(2) BNC, female</td>
</tr>
<tr>
<td><strong>Impedance:</strong></td>
<td>75 ohms</td>
</tr>
<tr>
<td><strong>Number of ASI Inputs:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Number of ASI Outputs:</strong></td>
<td>1 (non loop-through)</td>
</tr>
<tr>
<td><strong>Standard:</strong></td>
<td>EN50083-9 (V2:3/98) DVB ASI</td>
</tr>
<tr>
<td><strong>Data Bit Rate:</strong></td>
<td>270 Mbps</td>
</tr>
<tr>
<td><strong>Max TS Rate Supported:</strong></td>
<td>160 Mbps (Dependent on configuration)</td>
</tr>
</tbody>
</table>

### 310M Serial TS Input / Output -

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of 310M Inputs:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Number of 310M Outputs:</strong></td>
<td>1 (non loop-through)</td>
</tr>
<tr>
<td><strong>Standard:</strong></td>
<td>SMPTE-310M</td>
</tr>
<tr>
<td><strong>Data Bit Rate:</strong></td>
<td>19.39 Mbps, synchronous</td>
</tr>
</tbody>
</table>
**High Bit Rate ASI Input Option**

This card is not needed with MPEG-2/MPEG-4 4:2:0 (1Video, 2 Audio) decoder, but is supported in the D9887B receiver.

<table>
<thead>
<tr>
<th>ASI Serial TS Input / Output</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of ASI Inputs:</td>
<td>1</td>
</tr>
<tr>
<td>Number of ASI Outputs:</td>
<td>1 (passive loop-through)</td>
</tr>
<tr>
<td>Standard:</td>
<td>EN50083-9 (V2:3/98) DVB ASI</td>
</tr>
<tr>
<td>Max Program Bit Rate:</td>
<td>54 Mbps</td>
</tr>
<tr>
<td>Data Bit Rate:</td>
<td>270 Mbps</td>
</tr>
<tr>
<td>Max TS Rate Supported:</td>
<td>160 Mbps for MPTS</td>
</tr>
<tr>
<td>Connector:</td>
<td>(2) BNC, female</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 ohms</td>
</tr>
</tbody>
</table>
## Video Output (2 SD-SDI, 1 Composite) Option

<table>
<thead>
<tr>
<th>SDI (Serial Digital Interface, Standard definition) -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard:</td>
<td>ITU-BT.601/SMPTE 259M</td>
</tr>
<tr>
<td>Data Bit Rate:</td>
<td>270 Mbps</td>
</tr>
<tr>
<td>Number of Serial Video Outputs:</td>
<td>2 (Isolated)</td>
</tr>
<tr>
<td>Display Modes:</td>
<td>Letterbox, cropped, anamorphic</td>
</tr>
<tr>
<td>Embedded Audio Format:</td>
<td>SMPTE 272M</td>
</tr>
<tr>
<td>Sample Rates Supported:</td>
<td>32 – 48 KHz</td>
</tr>
<tr>
<td>Sample Rate Out:</td>
<td>48 KHz</td>
</tr>
<tr>
<td>Output Squelch:</td>
<td>Enable, (Output muted if no input detected)</td>
</tr>
<tr>
<td>Number of Embedded Audio Channel Pairs:</td>
<td>4 (2 groups, each with 2 pairs)</td>
</tr>
<tr>
<td>Audio Types Supported:</td>
<td>Dolby E, Dolby Digital, MPEG2 layer 1 and 2, or PCM</td>
</tr>
<tr>
<td>Embedded Audio Control:</td>
<td>Selectable - &quot;type&quot;/disable (each pair independently controlled)</td>
</tr>
<tr>
<td>Audio Type Standard:</td>
<td>Compressed (IEC 60958)</td>
</tr>
<tr>
<td></td>
<td>Uncompressed (IEC 61937)</td>
</tr>
<tr>
<td>Closed Captions:</td>
<td>Embedded - EIA-708B or EIA-608B</td>
</tr>
<tr>
<td></td>
<td>Line 21 - Enable/Disable (selectable) SDI and Composite controlled simultaneously.</td>
</tr>
<tr>
<td>Connector:</td>
<td>(2) Female BNC</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 ohms</td>
</tr>
</tbody>
</table>

## Composite Video Out -

| Number of Outputs: | 1 (NTSC/PAL) |
| Connector: | BNC, female |
| Impedance: | 75 ohms, +/-10% |
| Return Loss: | > 25 dB |
| Frequency Response: | DC to 6.0 MHz |
| Amplitude: | 140 IRE (1.0 Vpp), +/-2 IRE |
| Display Modes: | Letterbox, cropped, anamorphic |
| NTSC - |  |
### Video Output (2 SD-SDI, 1 Composite) Option

<table>
<thead>
<tr>
<th>Standard:</th>
<th>ANSI/SMPTE 170M-1994; CCIR656</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format, Frame rate:</td>
<td>525 lines, 29.97 Hz (Interlaced)</td>
</tr>
<tr>
<td>Setup (pedestal):</td>
<td>On/Off, selectable</td>
</tr>
<tr>
<td>Closed Caption:</td>
<td>Enable/Disable, selectable</td>
</tr>
<tr>
<td>CC Standard:</td>
<td>EIA-608B</td>
</tr>
<tr>
<td>PAL -</td>
<td></td>
</tr>
<tr>
<td>Standard:</td>
<td>ITU.R.BT.470-6</td>
</tr>
<tr>
<td>Format, Frame rate:</td>
<td>625 lines, 25.00 Hz (Interlaced)</td>
</tr>
<tr>
<td>Genlock –</td>
<td></td>
</tr>
<tr>
<td>SDI:</td>
<td>Line and Pixel Adjustment</td>
</tr>
<tr>
<td>Composite:</td>
<td>Line, Pixel, Color Phase Adjustment</td>
</tr>
</tbody>
</table>
## Video Output (2 HD-SDI, 1 RGBHV/YPbPr) Option

<table>
<thead>
<tr>
<th>General -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Connectors:</td>
<td>2 – HD-SDI, 1 – Analog Video</td>
</tr>
<tr>
<td>Output Formats:</td>
<td>1920 x 1080 Interlaced (1080i)</td>
</tr>
<tr>
<td></td>
<td>1280 x 720 Progressive</td>
</tr>
<tr>
<td></td>
<td>720 x 480 Progressive (480p)</td>
</tr>
<tr>
<td></td>
<td>720 x 480 Interlaced (480i)</td>
</tr>
<tr>
<td>Frame Rates:</td>
<td>1080i@ 25 Hz, 29.97 Hz, 30 Hz</td>
</tr>
<tr>
<td></td>
<td>720p@ 50 Hz, 59.94 Hz, 60 Hz</td>
</tr>
<tr>
<td></td>
<td>480p@ 59.94 Hz</td>
</tr>
<tr>
<td></td>
<td>480i@ 29.97 Hz</td>
</tr>
<tr>
<td>Aspect Ratio:</td>
<td>16x9 (fixed: 1080i, 720p)</td>
</tr>
<tr>
<td></td>
<td>16x9, 4x3 (selectable: 480p, 480i)</td>
</tr>
<tr>
<td>Display Modes:</td>
<td>HD: Letterbox, Cropped</td>
</tr>
<tr>
<td></td>
<td>SD: Letterbox, Cropped</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HD-SDI –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard:</td>
<td>SMPTE 292M</td>
</tr>
<tr>
<td>Data Bit Rate:</td>
<td>1.485 Gbps</td>
</tr>
<tr>
<td>Number of Serial Outputs:</td>
<td>2</td>
</tr>
<tr>
<td>Connector:</td>
<td>(2) BNC, female</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 ohms, +/-10%</td>
</tr>
<tr>
<td>Return loss:</td>
<td>≥ 15 dB,</td>
</tr>
<tr>
<td>Number of Video formats Supported:</td>
<td>2</td>
</tr>
<tr>
<td>Video Format Standards:</td>
<td>SMPTE 274M (1080i, 29.97 Hz)</td>
</tr>
<tr>
<td></td>
<td>SMPTE 296M (720P, 59.94 Hz)</td>
</tr>
<tr>
<td>Embedded Audio Format:</td>
<td>SMPTE 299M</td>
</tr>
<tr>
<td>Sample Rates Supported:</td>
<td>32, 44.1, 48 KHz</td>
</tr>
<tr>
<td>Sample Rate Output:</td>
<td>48 KHz</td>
</tr>
<tr>
<td>Number of Embedded Audio Channel Pairs:</td>
<td>4 (2 groups, each with 2 pairs)</td>
</tr>
<tr>
<td>Audio Types Supported:</td>
<td>Dolby Digital, MPEG2 layer 1 and 2, or PCM</td>
</tr>
<tr>
<td></td>
<td>Dolby E, with Audio Output (Dolby E, AES)</td>
</tr>
</tbody>
</table>
**Video Output (2 HD-SDI, 1 RGBHV/YPbPr) Option**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Embedded Audio Control:</strong></td>
<td>Selectable - “type” and disable (Each pair independently controlled)</td>
</tr>
<tr>
<td><strong>Audio Type Standard:</strong></td>
<td>Compressed (IEC 60958)</td>
</tr>
<tr>
<td></td>
<td>Uncompressed (IEC 61937)</td>
</tr>
<tr>
<td><strong>Closed Captions:</strong></td>
<td>Embedded - EIA-708B or EIA-608B</td>
</tr>
<tr>
<td></td>
<td>Enable/Disable – selectable</td>
</tr>
<tr>
<td><strong>Analog Video –</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Video Format Standards:</strong></td>
<td>SMPTE-274M (1080i)</td>
</tr>
<tr>
<td></td>
<td>SMPTE-296M (720p)</td>
</tr>
<tr>
<td></td>
<td>SMPTE-253M (480p, 480i)</td>
</tr>
<tr>
<td></td>
<td>(Reference: EIA 770.2 and 770.3)</td>
</tr>
<tr>
<td><strong>Number of Analog Outputs:</strong></td>
<td>1 (shared: RGBHV and YPbPr)</td>
</tr>
<tr>
<td><strong>Connector:</strong></td>
<td>High Density 15-pin D-sub, female</td>
</tr>
<tr>
<td><strong>Impedance:</strong></td>
<td>75 ohms, +/-10%, 1 Kohm for syncs</td>
</tr>
<tr>
<td><strong>Return Loss:</strong></td>
<td>&gt; 20 dB, 30 KHz – 30 MHz</td>
</tr>
<tr>
<td><strong>Frequency Response:</strong></td>
<td>Y = 30 KHz – 30 MHz, +/-0.2 dB ripple</td>
</tr>
<tr>
<td></td>
<td>PbPr = 30 KHz – 15 MHz, +/-0.2 dB ripple</td>
</tr>
<tr>
<td><strong>H/V Sync:</strong></td>
<td>4 Vpp into 1 M ohm, positive polarity</td>
</tr>
<tr>
<td><strong>Genlock -</strong></td>
<td></td>
</tr>
<tr>
<td><strong>HD-SDI:</strong></td>
<td>Line and Pixel Adjustment</td>
</tr>
<tr>
<td><strong>Options available –</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Opt 1:</strong></td>
<td>Analog video breakout cable</td>
</tr>
<tr>
<td><strong>Connectors:</strong></td>
<td>(5) BNC, male;</td>
</tr>
<tr>
<td></td>
<td>R, G, B, Horizontal Sync, Vertical Sync or Pr, Y, Pb, --, --</td>
</tr>
<tr>
<td><strong>Length:</strong></td>
<td>48 inches</td>
</tr>
</tbody>
</table>

4043118 Rev A
## Video Output (1 RGBHV/YPbPr, 1 Composite) Option

### Analog Video General -

<table>
<thead>
<tr>
<th>Video Standards:</th>
<th>SMPTE-274M (1080i and 1080p)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMPTE-296M (720p)</td>
</tr>
<tr>
<td></td>
<td>SMPTE-253M (480p)</td>
</tr>
<tr>
<td></td>
<td>SMPTE-170M (480i)</td>
</tr>
</tbody>
</table>

(Reference: EIA 770.2 and 770.3)

<table>
<thead>
<tr>
<th>Output Formats:</th>
<th>1920 x 1080 Interlaced (1080i)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1920 x 1080 Progressive (1080p)</td>
</tr>
<tr>
<td></td>
<td>1280 x 720 Progressive (720p)</td>
</tr>
<tr>
<td></td>
<td>720 x 480 Progressive (480p)</td>
</tr>
<tr>
<td></td>
<td>720 x 480 Interlaced (480i)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame Rates:</th>
<th>1080i@ 25 Hz, 29.97 Hz, 30 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>720p@ 50 Hz, 59.94 Hz, 60 Hz</td>
</tr>
<tr>
<td></td>
<td>480p@ 59.94 Hz</td>
</tr>
<tr>
<td></td>
<td>480i@ 29.97 Hz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aspect Ratio:</th>
<th>16x9 (fixed: 1080i, 720p)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16x9, 4x3 (selectable: 480p, 480i)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display Modes:</th>
<th>HD: Letterbox, Cropped, Anamorphic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD: Letterbox, Cropped, Anamorphic</td>
</tr>
</tbody>
</table>

### Composite General –

<table>
<thead>
<tr>
<th>Standard:</th>
<th>ANSI/SMPTE-170M-1994</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CCIR656</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output Formats:</th>
<th>PAL Standard</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NTSC:</th>
<th>480 Interlaced</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAL:</td>
<td>576 Interlaced</td>
</tr>
</tbody>
</table>

**Note:** Simultaneous RGB/YPbPr and Composite operation in 480i, 29.97 Hz format only.

### Analog Video –

| Number of Outputs: | 1 (shared: RGBHV and YPbPr) |
**Video Output (1 RGBHV/YPbPr, 1 Composite) Option**

<table>
<thead>
<tr>
<th>Connector:</th>
<th>High Density 15-pin D-sub, female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance:</td>
<td>75 ohms, +/-10%; 1 k ohm for syncs</td>
</tr>
<tr>
<td>Return Loss:</td>
<td>&gt; 20 dB, 30 KHz - 30 MHz</td>
</tr>
<tr>
<td>Frequency Response:</td>
<td>Y = 30 KHz - 30 MHz, +/-0.2 dB ripple</td>
</tr>
<tr>
<td></td>
<td>PbPr = 30 KHz - 15 MHz, +/-0.2 dB ripple</td>
</tr>
<tr>
<td>H/V Sync:</td>
<td>4 Vpp into 1 Mohm, negative polarity</td>
</tr>
</tbody>
</table>

**Composite Video Out**

| Number of Outputs: | 1 (NTSC/PAL)               |
| Connector:         | BNC, female                |
| Impedance:         | 75 ohms, +/-10%            |
| Return Loss:       | > 25 dB                    |
| Frequency Response:| DC to 6.0 MHz              |
| Amplitude:         | 140 IRE (1.0 Vpp), +/-2 IRE |

**NTSC**

| Standard:          | ANSI/SMPTE 170M-1994; CCIR656 |
| Format, Frame rate | 525 lines, 29.97 Hz (480i)     |
| Setup (pedestal):  | On/Off, selectable            |
| Closed Caption:    | Enable/Disable, selectable    |
| CC Standard:       | EIA-608B                     |

**PAL**

| Standard:          | ITU-R.BT.470-6               |
| Format, Frame rate | 625 lines, 25.00 Hz          |

**Genlock**

<table>
<thead>
<tr>
<th>Line and Pixel Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color Phase Adjustment (Video Output (2 HD/SD-SDi, 1 RGBHV/YPbPr?Composite) option only)</td>
</tr>
</tbody>
</table>
## Audio Output (Dolby E, AES Digital, Analog) Option

<table>
<thead>
<tr>
<th>General -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio Source:</td>
<td>Selected Audio Services 1-4</td>
</tr>
<tr>
<td># Of Services:</td>
<td>2 supported per Audio output (Dolby E, AES Digital, Analog) option card</td>
</tr>
<tr>
<td>Service Source:</td>
<td>D9887B Configuration 1 Opt 1/3 (2 services)</td>
</tr>
<tr>
<td>D9887B Configuration 1 Opt 2/4 (4 services) (Requires 2 Audio Output (Dolby E, AES Digital, Analog) output cards)</td>
<td></td>
</tr>
<tr>
<td>Modes:</td>
<td>User defined, Monitor, Transmission</td>
</tr>
<tr>
<td>Dolby E PID:</td>
<td>Dolby E extracted digital data output provides extracted Dolby E for embedding</td>
</tr>
</tbody>
</table>

### Digital Audio Out –

<table>
<thead>
<tr>
<th>Dolby E:</th>
<th>Available with breakout cable on 15-pin D-sub Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Output format:</td>
<td>S/PDIF/AES3id (Unbalanced)</td>
</tr>
<tr>
<td>Type (selectable):</td>
<td>Raw (native – Dolby Digital, MPEG, etc.),</td>
</tr>
<tr>
<td>PCM (uncompressed Ch1 and 2),</td>
<td></td>
</tr>
<tr>
<td>Standard:</td>
<td>IEC 60958-3 Dolby Digital (consumer),</td>
</tr>
<tr>
<td></td>
<td>MPEG-1/2, layers 1 and 2</td>
</tr>
<tr>
<td></td>
<td>AES3id (IEC 60958-4/61937), Ch1/2 (professional)</td>
</tr>
<tr>
<td>Connector:</td>
<td>(2) BNC, female</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 ohms</td>
</tr>
</tbody>
</table>

### Analog Audio Out -

<table>
<thead>
<tr>
<th>Output Type:</th>
<th>Balanced, 2 channel pairs (+/-, L/R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source:</td>
<td>Same as selected Digital PCM above</td>
</tr>
<tr>
<td>Conditions:</td>
<td>Load=600 ohms,</td>
</tr>
<tr>
<td></td>
<td>-20 dBFS encoded TS source</td>
</tr>
<tr>
<td>Amplitude:</td>
<td>24.4 dBu</td>
</tr>
<tr>
<td></td>
<td>Adjustable down to 4 dBu</td>
</tr>
<tr>
<td>Max Output:</td>
<td>27 dBu</td>
</tr>
</tbody>
</table>
### Audio Output (Dolby E, AES Digital, Analog) Option

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>THD+N:</td>
<td>&lt; 0.01%</td>
</tr>
<tr>
<td>Crosstalk:</td>
<td>&lt; -85 dB</td>
</tr>
<tr>
<td>Frequency Response:</td>
<td>20 Hz to 20 KHz &lt; +/-0.1 dBu</td>
</tr>
<tr>
<td>Connector:</td>
<td>High density 15-pin D-sub, male</td>
</tr>
<tr>
<td>Impedance:</td>
<td>600 ohms nominal</td>
</tr>
<tr>
<td></td>
<td>50 ohms min.</td>
</tr>
</tbody>
</table>

**Options available –**

**Audio output (Dolby E, AES Digital, Analog) option 1:**
- Audio breakout cable with XLR and Dolby E BNC
- Connectors: (4) XLR, male; Chan 1 – L, R Chan 2 – L, R
- (1) BNC, male; Dolby E
- (1) High density 15-pin D-sub, female
- Length: 14 inches

**Audio output (Dolby E, AES Digital, Analog) option 3:**
- Audio breakout cable with unbalanced BNC and Dolby E BNC
- Connectors: (5) BNC, male; Chan 1 – L, R Chan 2 – L, R Dolby E
- (1) High density 15-pin D-sub, female
- Length: 14 inches

**Audio output (Dolby E, AES Digital, Analog) option 4:**
- Dolby E breakout cable
- Connectors: (1) BNC, male; Dolby E
- (1) High density 15-pin D-sub, female
- Length: 14 inches
# Dual Video Output (2 SDI, 1 RGBHV/YPbPr/Composite) Option

<table>
<thead>
<tr>
<th>General</th>
<th>2 Female BNC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>2 Female BNC</td>
</tr>
<tr>
<td>Impedance</td>
<td>75 ohms ±10%</td>
</tr>
<tr>
<td>Output Connectors:</td>
<td>2 – SDI, 1 – RGBHV/YPbPr/Composite (Composite/YPbPr output with breakout cable only)</td>
</tr>
<tr>
<td>Genlock</td>
<td></td>
</tr>
<tr>
<td>SDI:</td>
<td>Line and Pixel Adjustment</td>
</tr>
<tr>
<td>Composite:</td>
<td>Line, Pixel, Color Phase Adjustment</td>
</tr>
<tr>
<td>SDI (Serial Digital Interface) Video Out</td>
<td></td>
</tr>
<tr>
<td>HD-SDI Standard:</td>
<td>SMPTE-92M</td>
</tr>
<tr>
<td></td>
<td>SMPTE-274M (1080i and 1080p)</td>
</tr>
<tr>
<td></td>
<td>SMPTE-296M (720p)</td>
</tr>
<tr>
<td>SD-SDI Standard:</td>
<td>ITU-BT.601/SMPTE S259M</td>
</tr>
<tr>
<td>Data Bit Rate:</td>
<td>SD-SDI – 270 Mbps</td>
</tr>
<tr>
<td></td>
<td>HD-SDI – 1.485 Gbps</td>
</tr>
<tr>
<td>Display Modes:</td>
<td>HD: Pillarbars, Cropped, Anamorphic</td>
</tr>
<tr>
<td></td>
<td>SD: Letterbox, Cropped, Anamorphic</td>
</tr>
<tr>
<td>Embedded Audio Format:</td>
<td>SD-SDI – SMPTE 272M</td>
</tr>
<tr>
<td></td>
<td>HD-SDI – SMPTE 299M</td>
</tr>
<tr>
<td>Sample Rates Supported:</td>
<td>48 kHz</td>
</tr>
<tr>
<td>Sample Rate Out:</td>
<td>48 kHz</td>
</tr>
<tr>
<td>Output Squelch:</td>
<td>Selectable – Enable/Disable (when no input is detected, output is muted)</td>
</tr>
<tr>
<td>Number of Embedded Audio Channel Pairs:</td>
<td>4 (2 groups, each with 2 pairs)</td>
</tr>
<tr>
<td>Audio Types Supported:</td>
<td>Dolby Digital, MPEG-2 layer 1 and 2, or PCM</td>
</tr>
<tr>
<td></td>
<td>Dolby E, with Audio output (Dolby E, AES Digital, Analog) option</td>
</tr>
<tr>
<td>Embedded Audio Control:</td>
<td>Selectable “type”/disable (each pair independently controlled)</td>
</tr>
<tr>
<td>Audio Type Standard:</td>
<td>Compressed (IEC 60958)</td>
</tr>
<tr>
<td><strong>Dual Video Output (2 SDI, 1 RGBHV/YPbPr/Composite) Option</strong></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Closed Captions:</strong></td>
<td>Embedded – EIA-708B or EIA-608B</td>
</tr>
<tr>
<td><strong>Line 21 – Enabled/Disabled (selectable) SDI and</strong></td>
<td><strong>Composite controlled simultaneously</strong></td>
</tr>
<tr>
<td><strong>Analog Video -</strong></td>
<td><strong>Uncompressed (IEC 61937)</strong></td>
</tr>
<tr>
<td><strong>Video Format Standards:</strong></td>
<td>SMPTE-274M (1080i and 1080p)</td>
</tr>
<tr>
<td></td>
<td>SMPTE-296M (720p)</td>
</tr>
<tr>
<td></td>
<td>SMPTE-253M (480p, 480i) (reference EIA 770.2 and 770.3)</td>
</tr>
<tr>
<td><strong>Number of Analog Outputs:</strong></td>
<td>1 (shared: RGBHV or YPbPr/Composite via breakout cable)</td>
</tr>
<tr>
<td><strong>Connector:</strong></td>
<td>High Density 15-pin D-sub, female</td>
</tr>
<tr>
<td><strong>Impedance:</strong></td>
<td>75 ohms, ±10%, 1 Kohm for syncs</td>
</tr>
<tr>
<td><strong>Return Loss:</strong></td>
<td>&gt; 20 dB, 30 kHz – 30 MHz</td>
</tr>
<tr>
<td><strong>Frequency Response:</strong></td>
<td>Y = 30 kHz – 30 MHz, ± 0.2 dB ripple</td>
</tr>
<tr>
<td></td>
<td>PbPr = 30 kHz – 15 MHz, ± 0.2 dB ripple</td>
</tr>
<tr>
<td><strong>H/V Sync:</strong></td>
<td>4 Vpp into 1 Mohm, positive polarity</td>
</tr>
<tr>
<td><strong>Options available –</strong></td>
<td><strong>Analog video breakout cable</strong></td>
</tr>
<tr>
<td><strong>Opt 1:</strong></td>
<td><strong>Connectors:</strong></td>
</tr>
<tr>
<td></td>
<td>(5) BNC, male:</td>
</tr>
<tr>
<td></td>
<td>R, G, B, Horizontal Sync, Vertical Sync, Pr, Y, Pb, --, Composite</td>
</tr>
<tr>
<td></td>
<td>(1) High density 15-pin D-sub, female</td>
</tr>
<tr>
<td><strong>Length:</strong></td>
<td>48 inches</td>
</tr>
</tbody>
</table>
## Dual Input DVB-S2 Receiver Option

<table>
<thead>
<tr>
<th>Category</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
</tr>
<tr>
<td>Frequency Range:</td>
<td>950 MHz – 2150 MHz</td>
</tr>
<tr>
<td>Number of inputs:</td>
<td>2 (A and B)</td>
</tr>
<tr>
<td>Connector:</td>
<td>F-81 Type, Female (2)</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 Ohms</td>
</tr>
<tr>
<td>Return Loss:</td>
<td>&gt; 9 dB</td>
</tr>
<tr>
<td>Separation:</td>
<td>&gt; 65 dB</td>
</tr>
<tr>
<td>Legacy DVB-S Modulation:</td>
<td>QPSK</td>
</tr>
<tr>
<td>DVB-S2 Modulation:</td>
<td>QPSK, 8PSK</td>
</tr>
<tr>
<td>Packet size:</td>
<td>188 bytes</td>
</tr>
<tr>
<td>Modulation/Coding supported:</td>
<td>CCM (ACM &amp; VCM not supported)</td>
</tr>
<tr>
<td>Transport Stream:</td>
<td>Up to 81 Mbps</td>
</tr>
<tr>
<td>Nyquist root filter roll-off factors:</td>
<td>.20, .25, .35</td>
</tr>
<tr>
<td>RF Input Level:</td>
<td>-25 dBm to -65 dBm</td>
</tr>
<tr>
<td>Input RF Spectrum:</td>
<td>Normal/Inverted Auto Detect</td>
</tr>
<tr>
<td><strong>DVB-S</strong></td>
<td></td>
</tr>
<tr>
<td>Standard:</td>
<td>EN 300 421</td>
</tr>
<tr>
<td>FEC Code:</td>
<td>Conv. + Reed-Solomon</td>
</tr>
<tr>
<td>Viterbi soft decoder rate:</td>
<td>1/2</td>
</tr>
<tr>
<td>Code rates:</td>
<td>1/2, 2/3, 3/4, 5/6, 7/8</td>
</tr>
<tr>
<td>QPSK Symbol rate:</td>
<td>1-45 MSym/s</td>
</tr>
<tr>
<td><strong>DVB-S2</strong></td>
<td></td>
</tr>
<tr>
<td>Standard:</td>
<td>EN 302 307</td>
</tr>
<tr>
<td>Decoding type:</td>
<td>LDPC and BCH</td>
</tr>
<tr>
<td>FEC Framing Type</td>
<td>Normal Frames</td>
</tr>
<tr>
<td>QPSK supported rates:</td>
<td>1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10</td>
</tr>
<tr>
<td>8PSK supported rates:</td>
<td>3/5, 2/3, 3/4, 5/6, 8/9, 9/10</td>
</tr>
<tr>
<td>QPSK Symbol rate:</td>
<td>1-30 MSym/s</td>
</tr>
<tr>
<td>8PSK Symbol rate:</td>
<td>1-30 MSym/s</td>
</tr>
<tr>
<td>Carrier Loop capture range:</td>
<td>+/-5 MHz</td>
</tr>
<tr>
<td>Pilot:</td>
<td>On/Off Auto Detect</td>
</tr>
</tbody>
</table>
## Dual Input ASM Receiver Option

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range:</td>
<td>950 MHz – 2150 MHz</td>
</tr>
<tr>
<td>Number of inputs:</td>
<td>2 (A and B)</td>
</tr>
<tr>
<td>Connector:</td>
<td>F-81 Type, Female (2)</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 Ohms</td>
</tr>
<tr>
<td>Return Loss:</td>
<td>&gt; 7 dB</td>
</tr>
<tr>
<td>Legacy DVB-S Modulation:</td>
<td>QPSK</td>
</tr>
<tr>
<td>Packet size:</td>
<td>188 bytes</td>
</tr>
<tr>
<td>Transport Stream:</td>
<td>Up to 72 Mbit/s (depends on FEC and mode)</td>
</tr>
<tr>
<td>RF Input Level:</td>
<td>-65 dBm to -25 dBm</td>
</tr>
<tr>
<td>Input RF Spectrum:</td>
<td>Normal/Inverted Auto Detect</td>
</tr>
</tbody>
</table>

### DVB-S (QPSK)-

| Standard: | EN 300 421 |
| FEC Code: | Viterbi + Reed-Solomon |
| Code rates: | 1/2, 2/3, 3/4, 5/6, 7/8 |
| Symbol rate: | 0.256 MSym/s – 30 Msym/s |

### Adv-PSK –

| FEC Code: | Advanced + Reed-Solomon |
| Code rates: | 1/2, 2/3, 3/4, 5/6, 7/8 |
| Symbol rate: | 0.256 MSym/s – 30 Msym/s |

### 8-PSK –

| FEC Code: | Advanced + Reed-Solomon |
| Symbol rate: | 0.256 MSym/s – 30 Msym/s |
# Video Output (2 SDI, 1 RGBHV/YPbPr/Composite) Option

SDI outputs 1 and 2 can be set to either HD-SDI or SD-SDI independently.

<table>
<thead>
<tr>
<th>General -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector:</td>
<td>2 Female BNC</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 ohms ±10%</td>
</tr>
<tr>
<td>Output Connectors:</td>
<td>2 - SDI, 1 - RGBHV/YPbPr/Composite</td>
</tr>
<tr>
<td></td>
<td>(Composite/YPbPr output with breakout cable only)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Genlock -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SDI:</td>
<td>Line and Pixel Adjustment</td>
</tr>
<tr>
<td>Composite:</td>
<td>Line, Pixel, Color Phase Adjustment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SDI (Serial Digital Interface) Video Out -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Capability:</td>
<td>Can display HD-SDI and SD-SDI simultaneously</td>
</tr>
<tr>
<td>HD-SDI Standard:</td>
<td>SMPTE-292M</td>
</tr>
<tr>
<td></td>
<td>SMPTE-274M (1080i, 29.97 Hz)</td>
</tr>
<tr>
<td></td>
<td>SMPTE-296M (720p, 59.94 Hz)</td>
</tr>
<tr>
<td>SD-SDI Standard:</td>
<td>ITU-BT.601/SMPTE-S259M</td>
</tr>
<tr>
<td>Data Bit Rate:</td>
<td>SD-SDI – 270 Mbps</td>
</tr>
<tr>
<td></td>
<td>HD-SDI – 1.485 Gbps</td>
</tr>
<tr>
<td>Display Modes:</td>
<td>Letterbox, cropped, anamorphic</td>
</tr>
<tr>
<td>Embedded Audio Format:</td>
<td>SD-SDI – SMPTE-272M</td>
</tr>
<tr>
<td></td>
<td>HD-SDI – SMPTE-299M</td>
</tr>
<tr>
<td>Sample Rates Supported:</td>
<td>48 kHz</td>
</tr>
<tr>
<td>Sample Rate Out:</td>
<td>48 kHz</td>
</tr>
<tr>
<td>Output Squelch:</td>
<td>Selectable – Enable/Disable (when no input is detected, output is muted)</td>
</tr>
<tr>
<td>Number of Embedded Audio Channel Pairs:</td>
<td>8 (4 groups, each with 2 pairs)</td>
</tr>
<tr>
<td>Audio Types Supported:</td>
<td>Dolby Digital, MPEG-2 layer 1 and 2, or PCM</td>
</tr>
<tr>
<td></td>
<td>Dolby E, with Audio Output (Dolby E, AES Digital, Analog) option</td>
</tr>
<tr>
<td>Embedded Audio Control:</td>
<td>Selectable – &quot;type&quot;/disable (each pair independently controlled)</td>
</tr>
</tbody>
</table>
### Audio Type Standard
- Compressed (IEC 60958)
- Uncompressed (IEC 61937)

### Closed Captions
- Embedded – EIA-708B or EIA-608B
- Line 21 – Enabled/Disabled (selectable) SDI and Composite controlled simultaneously

### Analog Video -

#### Video Format Standards
- SMPTE-274M (1080i)
- SMPTE-296M (720p)
- SMPTE-253M (480p, 480i)
  (reference EIA 770.2 and 770.3)

#### Number of Analog Outputs
- 1 (shared: RGBHV or YPbPr/Composite via breakout cable)

#### Connector
- High Density 15-pin D-sub, female

#### Impedance
- 75 ohms, ±10%, 1 Kohm for syncs

#### Return Loss
- > 20 dB, 30 kHZ – 30 MHz

#### Frequency Response
- Y = 30 kHz – 30 MHz, ± 0.2 dB ripple
- PbPr = 30 kHz – 15 MHz, ± 0.2 dB ripple

#### H/V Sync
- 4 Vpp into 1 Mohm, positive polarity

### Composite Video Out -

#### Number of Outputs
- 1 (NTSC/PAL)

#### Connector
- Breakout cable into BNC, female

#### Impedance
- 75 ohms, +/-10%

#### Return Loss
- > 25 dB

#### Frequency Response
- DC to 6.0 MHz

#### Amplitude
- 140 IRE (1.0 Vpp), +/-2 IRE

#### Display Modes
- Letterbox, cropped, anamorphic

<table>
<thead>
<tr>
<th>NTSC</th>
<th>PAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard:</td>
<td>ANSI/SMPTE 170M-1994; CCIR656</td>
</tr>
<tr>
<td>Format, Frame rate:</td>
<td>525 lines, 29.97 Hz (Interlaced)</td>
</tr>
<tr>
<td></td>
<td>625 lines, 25.00 Hz (Interlaced)</td>
</tr>
<tr>
<td>Setup (pedestal):</td>
<td>On/Off, selectable</td>
</tr>
<tr>
<td>Closed Caption:</td>
<td>Enable/Disable, selectable</td>
</tr>
<tr>
<td>CC Standard:</td>
<td>EIA-608B</td>
</tr>
</tbody>
</table>
### GPIO Module Option

<table>
<thead>
<tr>
<th>General –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Interfaces:</td>
<td>Web GUI and SNMP</td>
</tr>
<tr>
<td>+Vcc Voltage Level:</td>
<td>+5 @ 800 mA</td>
</tr>
<tr>
<td>Relay Type:</td>
<td>High-cycle, High-reliability</td>
</tr>
<tr>
<td>Contact Ratings:</td>
<td>&gt; 30 VDC @ 500 mA</td>
</tr>
<tr>
<td>Event Types:</td>
<td>OON (Out-Of-Network) and RTN (Return-To-Network)</td>
</tr>
<tr>
<td>Suggested Connector Type:</td>
<td>Phoenix 2.5 mm Pluggable Terminal Block</td>
</tr>
<tr>
<td>I/O –</td>
<td></td>
</tr>
<tr>
<td>Logic Input:</td>
<td>Provides four logic inputs</td>
</tr>
<tr>
<td>Logic Outputs:</td>
<td>Provides three open-collector outputs</td>
</tr>
<tr>
<td>Voltage Range:</td>
<td>5 – 24 volts logic switching and current limiting</td>
</tr>
<tr>
<td>Short circuit protection:</td>
<td>Yes</td>
</tr>
<tr>
<td>Relay Contact:</td>
<td>Provides three relay contact outputs</td>
</tr>
</tbody>
</table>
## Dual Input COFDM Receiver Option

<table>
<thead>
<tr>
<th>General –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility Standard:</td>
<td>EN 300 744</td>
</tr>
<tr>
<td>Spectrum:</td>
<td>Normal or Inverted</td>
</tr>
<tr>
<td>Frequency range:</td>
<td>49 MHz – 861 MHz</td>
</tr>
<tr>
<td>RF Input Level:</td>
<td>-70 dBm to -20 dBm</td>
</tr>
<tr>
<td>Channel bandwidth:</td>
<td>6 MHz, 7 MHz, 8 MHz</td>
</tr>
<tr>
<td>Guard interval:</td>
<td>1/4, 1/8, 1/16, 1/32</td>
</tr>
<tr>
<td>FFT size:</td>
<td>2K, 8K</td>
</tr>
<tr>
<td>Code rate:</td>
<td>1/2, 2/3, 3/4, 5/6, 7/8</td>
</tr>
<tr>
<td>Constellation:</td>
<td>QPSK, QAM16, QAM64</td>
</tr>
<tr>
<td>Connector:</td>
<td>2-F-81 Type, panel mount, female</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 Ohms</td>
</tr>
<tr>
<td>Return Loss:</td>
<td>&gt; 9 dB</td>
</tr>
</tbody>
</table>
# Quad Input DVB-S/DVB-S2 Receiver with LNB Option

<table>
<thead>
<tr>
<th>General -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range:</td>
<td>950 MHz – 2150 MHz</td>
</tr>
<tr>
<td>Number of inputs:</td>
<td>4 (A, B, C and D)</td>
</tr>
<tr>
<td>Connector:</td>
<td>F-81 Type, Female (4)</td>
</tr>
<tr>
<td>Impedance:</td>
<td>75 Ohms</td>
</tr>
<tr>
<td>Return Loss:</td>
<td>&gt; 9 dB</td>
</tr>
<tr>
<td>Separation:</td>
<td>&gt; 50 dB adjacent, &gt; 60 dB non-adjacent</td>
</tr>
<tr>
<td>RF frequency:</td>
<td>950 MHz to 2150 MHz in 1 MHz steps</td>
</tr>
<tr>
<td>Tuning:</td>
<td>Difference between Satellite frequency and LO frequency</td>
</tr>
<tr>
<td>Satellite frequency:</td>
<td>950 – 14500 MHz</td>
</tr>
<tr>
<td>LO frequency:</td>
<td>0 – 12000 MHz, with presets of 0, 5150, 9750, 10600, 10750 and 11250 MHz</td>
</tr>
<tr>
<td>Packet size:</td>
<td>188 bytes</td>
</tr>
<tr>
<td>Transport Stream:</td>
<td>Up to 81 Mbps</td>
</tr>
<tr>
<td>Nyquist root filter roll-off factors:</td>
<td>.20, .25, .35</td>
</tr>
<tr>
<td>RF Input Level</td>
<td>-65 dBm to -25 dBm</td>
</tr>
<tr>
<td>Carrier Loop capture range:</td>
<td>± 5 MHz</td>
</tr>
<tr>
<td>Input RF Spectrum</td>
<td>Normal/Inverted Auto Detect</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LNB Power and 22 kHz Tone -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Settings (LNB voltage / tone):</td>
<td>0/off, 13/off, 13/on, 14/off, 14/on, 18/off, 18/on, 19/off, 19/on</td>
</tr>
<tr>
<td>LNB Current:</td>
<td>&gt; 450 mA DC</td>
</tr>
<tr>
<td>LNB voltage regulation:</td>
<td>± 4%</td>
</tr>
<tr>
<td>22 kHz Tone:</td>
<td>650 mV (± 250 mV) peak-peak</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DVB-S -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard:</td>
<td>EN 300 421</td>
</tr>
<tr>
<td>FEC Code:</td>
<td>Conv. + Reed-Solomon</td>
</tr>
<tr>
<td>Modulation:</td>
<td>QPSK</td>
</tr>
<tr>
<td>Modulation/Coding supported:</td>
<td>CCM</td>
</tr>
<tr>
<td>Code rates:</td>
<td>1/2, 2/3, 3/4, 5/6, 7/8</td>
</tr>
<tr>
<td><strong>Quad Input DVB-S/DVB-S2 Receiver with LNB Option</strong></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>

**QPSK Symbol rate:** 1-45 MSym/s

**DVB-S2 –**

<table>
<thead>
<tr>
<th><strong>Standard:</strong></th>
<th>EN 302 307</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decoding type:</strong></td>
<td>LDPC and BCH</td>
</tr>
<tr>
<td><strong>Modulation:</strong></td>
<td>QPSK, 8PSK</td>
</tr>
<tr>
<td><strong>Modulation/Coding supported:</strong></td>
<td>CCM</td>
</tr>
<tr>
<td><strong>FEC Framing Type</strong></td>
<td>Short frame size (16200), Normal frame size (64800)</td>
</tr>
<tr>
<td><strong>QPSK supported rates:</strong></td>
<td>1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10</td>
</tr>
<tr>
<td><strong>8PSK supported rates:</strong></td>
<td>3/5, 2/3, 3/4, 5/6, 8/9, 9/10</td>
</tr>
<tr>
<td><strong>Symbol rate:</strong></td>
<td>1-45 MSym/s</td>
</tr>
<tr>
<td><strong>Pilot:</strong></td>
<td>On/Off Auto Detect</td>
</tr>
</tbody>
</table>

**Optional Features (DVB-S2):**

| **Multistream reception:** | ISI specified stream |
| **Modulation/Coding support:** | VCM |
| **16APSK Modulation:** | Supported rates: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 |
| **32APSK Modulation:** | Supported rates: 3/4, 4/5, 5/6, 8/9, 9/10 |
# CAM Decryption Option

<table>
<thead>
<tr>
<th>CAM Decryption –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong> –</td>
<td></td>
</tr>
<tr>
<td>Compatibility Standard:</td>
<td>DVB-CI EN 50221</td>
</tr>
<tr>
<td>Number of CAM Slots:</td>
<td>2</td>
</tr>
<tr>
<td>Bottom slot assignment:</td>
<td>RDS 1</td>
</tr>
<tr>
<td>Top slot assignment:</td>
<td>In Configuration 1, RDS 1 - both CAMs used by RDS 1</td>
</tr>
<tr>
<td>Auto CAM insertion/removal detection:</td>
<td>Yes</td>
</tr>
<tr>
<td>CAM usage:</td>
<td>Selectable, Enable/Disable</td>
</tr>
<tr>
<td>CAM name display:</td>
<td>Yes</td>
</tr>
<tr>
<td>Multicrypt Support:</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Decryption Selection –</strong></td>
<td></td>
</tr>
<tr>
<td>Elementary Stream types:</td>
<td>Video (both MPEG-2 and MPEG-4), Audio</td>
</tr>
<tr>
<td>Selection Modes:</td>
<td>Decoded streams</td>
</tr>
<tr>
<td></td>
<td>Individually elementary streams (Multi-service)</td>
</tr>
<tr>
<td>Maximum TS bit-rate:</td>
<td>72 Mbps</td>
</tr>
<tr>
<td><strong>CAS Supported –</strong></td>
<td>All major CAM modules, including:</td>
</tr>
<tr>
<td></td>
<td>NagraVision*</td>
</tr>
<tr>
<td></td>
<td>Irdeto*</td>
</tr>
<tr>
<td></td>
<td>Viaccess*</td>
</tr>
<tr>
<td></td>
<td>Conax*</td>
</tr>
<tr>
<td></td>
<td>NDS*</td>
</tr>
<tr>
<td><strong>BISS –</strong></td>
<td></td>
</tr>
<tr>
<td>Compatibility Standard:</td>
<td>DVB-CSA</td>
</tr>
<tr>
<td>Supported Modes:</td>
<td>Mode 1 and Mode E (Injected ID only No Buried ID)</td>
</tr>
<tr>
<td>Max TS Bit Rate:</td>
<td>120 Mbps per RDS</td>
</tr>
</tbody>
</table>
## Backup Network Controller Option

<table>
<thead>
<tr>
<th>General –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector:</td>
<td>1 – 10/100 Auto-negotiating Base-T RJ-45 Ethernet Port</td>
</tr>
</tbody>
</table>
# MPEG over IP Input/Output Option

This card physically requires two slots and is limited to one card per D9887B chassis.

<table>
<thead>
<tr>
<th>General –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector:</td>
<td>1 - 10/100/1000 Auto-negotiating Base-T RJ-45 Ethernet Port</td>
</tr>
<tr>
<td></td>
<td>1 - SFP Port (Optical or CAT6)</td>
</tr>
<tr>
<td>FEC Transmit/Receive:</td>
<td>Pro MPEG CoP3</td>
</tr>
<tr>
<td>Range:</td>
<td>L*D&lt;100</td>
</tr>
<tr>
<td></td>
<td>1&lt;L&lt;20</td>
</tr>
<tr>
<td></td>
<td>4&lt;D&lt;20</td>
</tr>
<tr>
<td>Annex B</td>
<td></td>
</tr>
<tr>
<td>Multicast Filtering:</td>
<td>Filters based on IP address (Avoids Problematic 30 IP – 1 MAC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Receive –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Format:</td>
<td>UDP and RTP</td>
</tr>
<tr>
<td></td>
<td>Multicast and Unicast</td>
</tr>
<tr>
<td>Bitrate Range:</td>
<td>1 – 160 Mbps</td>
</tr>
<tr>
<td>Packets/IP Frame:</td>
<td>1-7 MPEG Packets/IP Frame</td>
</tr>
<tr>
<td>IGMP Compatibility:</td>
<td>Version 1, 2, and 3</td>
</tr>
<tr>
<td>Network Jitter Buffer:</td>
<td>120 ms</td>
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<table>
<thead>
<tr>
<th>Transmit –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Format:</td>
<td>UDP and RTP</td>
</tr>
<tr>
<td>Bitrate Range:</td>
<td>1 – 160 Mbps</td>
</tr>
<tr>
<td>Packets/IP Frame:</td>
<td>1-7 MPEG Packets/IP Frame</td>
</tr>
<tr>
<td>Number of Outputs:</td>
<td>3 Mirrored TS – Unicast and/or Multicast</td>
</tr>
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</table>
**Dual Input MPEG over IP Receiver/UDP Output Option**

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<thead>
<tr>
<th>General -</th>
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<tbody>
<tr>
<td>Connector:</td>
<td>2 – 10/100/1000 Auto-negotiating Base-T RJ-45 Ethernet Port</td>
</tr>
<tr>
<td>FEC Receive:</td>
<td>Licensed – Pro MPEG CoP3 SMPTE-2022</td>
</tr>
<tr>
<td>Range: L*D&lt;100</td>
<td></td>
</tr>
<tr>
<td>1&lt;L&lt;20</td>
<td></td>
</tr>
<tr>
<td>4&lt;D&lt;20</td>
<td></td>
</tr>
<tr>
<td>Annex B</td>
<td></td>
</tr>
<tr>
<td>Multicast Filtering:</td>
<td>Filters based on IP address (Avoids Problematic 30 IP - 1 MAC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Receive -</th>
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</thead>
<tbody>
<tr>
<td>Input Format:</td>
<td>UDP, RTP, and RTP with extension headers</td>
</tr>
<tr>
<td></td>
<td>Multicast and Unicast</td>
</tr>
<tr>
<td></td>
<td>CBR, VBR, Null Stripped</td>
</tr>
<tr>
<td>Receiver Capability:</td>
<td>2 simultaneous MPEG over IP transport streams with automatic failover</td>
</tr>
<tr>
<td>Buffer size:</td>
<td>1 – 4000 KB, user settable</td>
</tr>
<tr>
<td>Bitrate Range:</td>
<td>1 – 160 Mbps</td>
</tr>
<tr>
<td>Packets/IP Frame:</td>
<td>1-7 MPEG Packets/IP Frame</td>
</tr>
<tr>
<td>IGMP Compatibility:</td>
<td>Version 1, 2, and 3</td>
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</tbody>
</table>

<table>
<thead>
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<th>Transmit -</th>
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</thead>
<tbody>
<tr>
<td>Output Format:</td>
<td>UDP</td>
</tr>
<tr>
<td>Bitrate Range:</td>
<td>1 – 160 Mbps</td>
</tr>
<tr>
<td>Packets/IP Frame:</td>
<td>1-7 MPEG Packets/IP Frame</td>
</tr>
<tr>
<td>Number of Outputs:</td>
<td>2 Mirrored TS – Unicast and/or Multicast</td>
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# PID Filtering Dual MPEG over IP UDP Output Option

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<td>Connector:</td>
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<td>Ethernet Port</td>
</tr>
<tr>
<td>Card Latency:</td>
<td>≤ 1000ms</td>
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<td>Transmit -</td>
<td></td>
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<tr>
<td>Output Format:</td>
<td>UDP</td>
</tr>
<tr>
<td>Bitrate Range:</td>
<td>1 – 160 Mbps per TS (constant bit rate)</td>
</tr>
<tr>
<td></td>
<td>400 Mbps Aggregate</td>
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<tr>
<td>Packets/IP Frame:</td>
<td>1-7 MPEG Packets/IP Frame</td>
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<tr>
<td>Number of Outputs:</td>
<td>5 Independent TS (MPTS or SPTS), each routed to</td>
</tr>
<tr>
<td></td>
<td>one of two Ethernet ports as desired – Unicast</td>
</tr>
<tr>
<td>PID Filtering -</td>
<td></td>
</tr>
<tr>
<td>PCR:</td>
<td>PCR restamping</td>
</tr>
<tr>
<td>Table Manipulation:</td>
<td>Automatic table adjustment</td>
</tr>
<tr>
<td></td>
<td>In MPEG mode:</td>
</tr>
<tr>
<td></td>
<td>▪ Adjusted tables: PAT, PMT</td>
</tr>
<tr>
<td></td>
<td>▪ Pass through tables: CAT, NIT</td>
</tr>
<tr>
<td></td>
<td>▪ Discarded tables: all remaining tables</td>
</tr>
<tr>
<td></td>
<td>In DVB mode:</td>
</tr>
<tr>
<td></td>
<td>▪ Adjusted tables: PAT, PMT, SDT actual</td>
</tr>
<tr>
<td></td>
<td>▪ Pass through tables: CAT, NIT, BAT, etc</td>
</tr>
<tr>
<td></td>
<td>▪ Discarded table: TSDT</td>
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### MPEG-2 Decoder (Video, 2 Audio) Option

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<th><strong>General</strong></th>
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<table>
<thead>
<tr>
<th><strong>Video Decoder</strong></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Compatibility Standard:</td>
<td>MPEG-2 4:2:0 MP@HL &amp; MP@ML</td>
</tr>
<tr>
<td>Video Bit Rate:</td>
<td>MPEG-2 1-80 Mbps (dependent on profile)</td>
</tr>
<tr>
<td>Primary Video Formats:</td>
<td>1080i@ 25 Hz, 29.97 Hz, 30 Hz</td>
</tr>
<tr>
<td></td>
<td>720p@ 50 Hz, 59.94 Hz, 60Hz</td>
</tr>
<tr>
<td></td>
<td>480p@ 59.94 Hz</td>
</tr>
<tr>
<td></td>
<td>480i@ 29.97 Hz</td>
</tr>
<tr>
<td></td>
<td>576i@ 25 Hz</td>
</tr>
<tr>
<td>Format Scaling:</td>
<td>Output Format Selectable</td>
</tr>
<tr>
<td>Display Modes:</td>
<td>Letterbox, Cropped, &amp; Anamorphic</td>
</tr>
<tr>
<td>Aspect Ratio:</td>
<td>16x9, 4x3 (Selectble - format dependent)</td>
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<table>
<thead>
<tr>
<th><strong>Audio Decoder</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Formats:</td>
<td>IEC-60958 (uncompressed)</td>
</tr>
<tr>
<td></td>
<td>IEC-61937 (compressed)</td>
</tr>
<tr>
<td></td>
<td>PCM Downmix</td>
</tr>
<tr>
<td>Allowed MPEG-2 PES Formats:</td>
<td>MPEG-2</td>
</tr>
<tr>
<td></td>
<td>MPEG-1</td>
</tr>
<tr>
<td></td>
<td>Dolby Digital</td>
</tr>
<tr>
<td></td>
<td>MPEG-2 AAC ADTS</td>
</tr>
<tr>
<td></td>
<td>MPEG-4 AAC ADTS &amp; LOAS</td>
</tr>
<tr>
<td></td>
<td>HE-AACv1</td>
</tr>
<tr>
<td></td>
<td>HE-AACv2</td>
</tr>
<tr>
<td></td>
<td>All pass-through compatible</td>
</tr>
<tr>
<td>Service Source:</td>
<td>D9887B Configuration 1 Opt 1/3 (2 services)</td>
</tr>
<tr>
<td>PCM Downmix (selectable):</td>
<td>L/R (Stereo), Lt/Rt (Surround), Auto, Mono1, Mono2</td>
</tr>
<tr>
<td>Modes (selectable):</td>
<td>User defined, Monitor, Transmission</td>
</tr>
<tr>
<td>AV Lip-sync -</td>
<td>Includes control for audio PTS and PCR tracing</td>
</tr>
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# MPEG-2 Decoder (Video, 2 Audio) Option

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<thead>
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<tbody>
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<td>Video Bit Rate:</td>
<td>MPEG-2 1-80 Mbps (dependent on profile)</td>
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<tr>
<td>Primary Video Formats:</td>
<td>1080i@ 25 Hz, 29.97 Hz, 30 Hz</td>
</tr>
<tr>
<td></td>
<td>720p@ 50 Hz, 59.94 Hz, 60 Hz</td>
</tr>
<tr>
<td></td>
<td>480p@ 59.94 Hz</td>
</tr>
<tr>
<td></td>
<td>480i@ 29.97 Hz</td>
</tr>
<tr>
<td></td>
<td>576i@ 25 Hz</td>
</tr>
<tr>
<td>Format Scaling:</td>
<td>Output Format Selectable</td>
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<tr>
<td>Display Modes:</td>
<td>Letterbox, Cropped, &amp; Anamorphic</td>
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<tr>
<td>Aspect Ratio:</td>
<td>16x9, 4x3 (Selectable - format dependent)</td>
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<th>Audio Decoder</th>
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<td>IEC-61937 (compressed)</td>
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<td>PCM Downmix</td>
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<tr>
<td>Allowed MPEG-2 PES Formats:</td>
<td>MPEG-2</td>
</tr>
<tr>
<td></td>
<td>MPEG-1</td>
</tr>
<tr>
<td></td>
<td>Dolby Digital</td>
</tr>
<tr>
<td></td>
<td>MPEG-2 AAC ADTS</td>
</tr>
<tr>
<td></td>
<td>MPEG-4 AAC ADTS &amp; LOAS</td>
</tr>
<tr>
<td></td>
<td>HE-AACv1</td>
</tr>
<tr>
<td></td>
<td>HE-AACv2</td>
</tr>
<tr>
<td></td>
<td>All pass-through compatible</td>
</tr>
<tr>
<td>Service Source:</td>
<td>MRD Configuration 1 Opt 1/3 (2 services)</td>
</tr>
<tr>
<td>PCM Downmix (selectable):</td>
<td>L/R (Stereo), Lt/Rt (Surround), Auto, Mono1, Mono2</td>
</tr>
<tr>
<td>Modes (selectable):</td>
<td>User defined, Monitor, Transmission</td>
</tr>
<tr>
<td>AV Lip-sync -</td>
<td>Includes control for audio PTS and PCR tracing</td>
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</table>
### MPEG-2 Decoder (Video, 2 Audio) Option

<table>
<thead>
<tr>
<th>Genlock Capability</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Includes Genlock capability for 8704A, 8705 video output card.</td>
<td></td>
</tr>
<tr>
<td>Limited support for earlier 8704 and 8706 video output card</td>
<td></td>
</tr>
<tr>
<td>(No Color burst phase adjust on NTSC outputs)</td>
<td></td>
</tr>
<tr>
<td>HD – Adjustment of pixels and lines. Max number</td>
<td></td>
</tr>
<tr>
<td>dependent on video mode</td>
<td></td>
</tr>
<tr>
<td>SD – Adjustment of Color burst phase, pixels, and lines.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Genlock Reference</th>
<th>Video 1080i @ 25 fps</th>
<th>- Ref 1080i tri-level sync @ 25 fps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Ref NTSC &quot;black and burst&quot;</td>
<td></td>
</tr>
<tr>
<td>Video 1080i @ 29.97</td>
<td>- Ref 1080i tri-level sync @ 29.97 fps</td>
<td></td>
</tr>
<tr>
<td>Video 1080i @ 30 fps</td>
<td>- Ref NTSC 1080i tri-level sync @ 30 fps</td>
<td></td>
</tr>
<tr>
<td>Video 720p @ 50 fps</td>
<td>- Ref 720p tri-level sync @ 50 fps</td>
<td></td>
</tr>
<tr>
<td>Video 720p @ 59.94 fps</td>
<td>- Ref 720p tri-level sync @ 59.94 fps</td>
<td></td>
</tr>
<tr>
<td>Video 720p @ 60 fps</td>
<td>- Ref 720p tri-level sync @ 29.97 fps</td>
<td></td>
</tr>
<tr>
<td>Video 480i @ 29.97</td>
<td>- Ref NTSC &quot;black and burst&quot;</td>
<td></td>
</tr>
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</table>
**MPEG-2/MPEG-4 Decoder (1 Video, 2 Audio)**

**Option**

<table>
<thead>
<tr>
<th>General -</th>
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</tr>
</thead>
<tbody>
<tr>
<td>TS Data Rate:</td>
<td>1-160 Mb/s</td>
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<table>
<thead>
<tr>
<th>Video Decoder -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility Standard:</td>
<td>MPEG-2 4:2:0 MP@HL &amp; MP@ML</td>
</tr>
<tr>
<td></td>
<td>MPEG-4 H.264 Compatible MP@4.1 &amp; HP@4</td>
</tr>
<tr>
<td>Video Bit Rate:</td>
<td>MPEG-2 1-80 Mbps (dependent on profile)</td>
</tr>
<tr>
<td></td>
<td>MPEG-4 H.264 1-50 Mbps (dependent on profile)</td>
</tr>
<tr>
<td>Primary Video Formats:</td>
<td>1080i@ 25 Hz, 29.97 Hz, 30 Hz</td>
</tr>
<tr>
<td></td>
<td>720p@ 50 Hz, 59.94 Hz, 60 Hz</td>
</tr>
<tr>
<td></td>
<td>480p@ 59.94 Hz</td>
</tr>
<tr>
<td></td>
<td>480i@ 29.97 Hz</td>
</tr>
<tr>
<td></td>
<td>576i@ 25 Hz</td>
</tr>
<tr>
<td>Format Scaling:</td>
<td>Output Format Selectable</td>
</tr>
<tr>
<td>Display Modes:</td>
<td>Letterbox, Cropped, &amp; Anamorphic</td>
</tr>
<tr>
<td>Aspect Ratio:</td>
<td>16x9, 4x3 (Selectable - format dependent)</td>
</tr>
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<table>
<thead>
<tr>
<th>Audio Decoder -</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Formats:</td>
<td>IEC-60958 (uncompressed)</td>
</tr>
<tr>
<td></td>
<td>IEC-61937 (compressed)</td>
</tr>
<tr>
<td></td>
<td>PCM Downmix</td>
</tr>
<tr>
<td>Allowed MPEG-2 PES Formats:</td>
<td>MPEG-2</td>
</tr>
<tr>
<td></td>
<td>MPEG-1</td>
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<tr>
<td></td>
<td>AC-3</td>
</tr>
<tr>
<td></td>
<td>EAC-3</td>
</tr>
<tr>
<td></td>
<td>Dolby E, with Audio Output (Dolby E, AES Digital, Analog) option</td>
</tr>
<tr>
<td></td>
<td>MPEG-2 AAC ADTS</td>
</tr>
<tr>
<td></td>
<td>MPEG-4 AAC ADTS &amp; LOAS</td>
</tr>
<tr>
<td></td>
<td>HE-AACv1</td>
</tr>
<tr>
<td></td>
<td>HE-AACv2</td>
</tr>
<tr>
<td></td>
<td>All pass-through compatible</td>
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### MPEG-2/MPEG-4 Decoder (1 Video, 2 Audio) Option

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<thead>
<tr>
<th>Service Source:</th>
<th>D9887B Configuration 1 Opt 1/3 (2 services)</th>
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<tbody>
<tr>
<td>PCM Downmix (selectable):</td>
<td>L/R (Stereo), Lt/Rt (Surround), Auto, Mono1, Mono2</td>
</tr>
<tr>
<td>Modes (selectable):</td>
<td>User defined, Monitor, Transmission</td>
</tr>
<tr>
<td>AV Lip-sync -</td>
<td>Includes control for audio PTS and PCR tracing</td>
</tr>
</tbody>
</table>
MPEG-2 Decoder with Genlock (1 Video, 4 Audio) Option

<table>
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<tr>
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<tr>
<td>TS Data Rate:</td>
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<table>
<thead>
<tr>
<th>Video Decoder</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Compatibility Standard:</td>
<td>MPEG-2 4:2:2 MP@HL &amp; MP@ML</td>
</tr>
<tr>
<td>Video Bit Rate:</td>
<td>MPEG-2 1-80 Mbps (dependent on profile)</td>
</tr>
<tr>
<td>Primary Video Formats:</td>
<td>1080i@ 25 Hz, 29.97 Hz, 30 Hz</td>
</tr>
<tr>
<td></td>
<td>720p@ 50 Hz, 59.94 Hz, 60 Hz</td>
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<tr>
<td></td>
<td>480p@ 59.94 Hz</td>
</tr>
<tr>
<td></td>
<td>480i@ 29.97 Hz</td>
</tr>
<tr>
<td></td>
<td>576i@ 25 Hz</td>
</tr>
<tr>
<td>Format Scaling:</td>
<td>Output Format Selectable</td>
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<tr>
<td>Display Modes:</td>
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<td>PCM Downmix</td>
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<tr>
<td>Allowed MPEG-2 PES Formats:</td>
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</tr>
<tr>
<td></td>
<td>MPEG-1</td>
</tr>
<tr>
<td></td>
<td>Dolby Digital</td>
</tr>
<tr>
<td></td>
<td>Up to 4 Dolby E PIDs (with 8707A)</td>
</tr>
<tr>
<td></td>
<td>MPEG-2 AAC ADTS</td>
</tr>
<tr>
<td>Service Source:</td>
<td>MRD Configuration 1 Opt 1/3 (2 services)</td>
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<tr>
<td>PCM Downmix (selectable):</td>
<td>L/R (Stereo), Lt/Rt (Surround), Mono1, Mono2</td>
</tr>
<tr>
<td>Modes (selectable):</td>
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# MPEG-2/MPEG-4 Decoder (1 Video, 2 Audio) Option

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<tbody>
<tr>
<td>TS Data Rate:</td>
<td>1-160 Mb/s</td>
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<tr>
<td>Video Bit Rate:</td>
<td>MPEG-2 1-80 Mbps (dependent on profile)</td>
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<td>MPEG-4 H.264 1-50 Mbps (dependent on profile)</td>
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<tr>
<td>Primary Video Formats:</td>
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<td>720p@ 50 Hz, 59.94 Hz, 60 Hz</td>
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<td>480p@ 59.94 Hz</td>
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<td>480i@ 29.97 Hz</td>
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<td>Output Format Selectable</td>
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<td>PCM Downmix</td>
</tr>
<tr>
<td>Allowed MPEG-2 PES Formats:</td>
<td>MPEG-2</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| Service Source:    | MRD Configuration 1 Opt 1/3 (2 services) |
| PCM Downmix (selectable): | L/R (Stereo), Lt/Rt (Surround), Auto, Mono1, Mono2 |</p>
<table>
<thead>
<tr>
<th>Modes (selectable):</th>
<th>User defined, Monitor, Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV Lip-sync -</td>
<td>Includes control for audio PTS and PCR tracing</td>
</tr>
<tr>
<td>Genlock Capability -</td>
<td>Includes Genlock capability for 8704A, 8705 video output card.</td>
</tr>
<tr>
<td></td>
<td>Limited support for earlier 8704 and 8706 video output card</td>
</tr>
<tr>
<td></td>
<td>(No Color burst phase adjust on NTSC outputs)</td>
</tr>
<tr>
<td>HD - Adjustment of pixels and lines. Max number</td>
<td>dependent on video mode</td>
</tr>
<tr>
<td>SD - Adjustment of Color burst phase, pixels, and lines.</td>
<td></td>
</tr>
<tr>
<td>Genlock Reference -</td>
<td>Video 1080i @ 25 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref 1080i tri-level sync @ 25 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref NTSC &quot;black and burst&quot;</td>
</tr>
<tr>
<td></td>
<td>Video 1080i @ 29.97</td>
</tr>
<tr>
<td></td>
<td>- Ref 1080i tri-level sync @ 29.97 fps</td>
</tr>
<tr>
<td></td>
<td>Video 1080i @ 30 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref NTSC 1080i tri-level sync @ 30 fps</td>
</tr>
<tr>
<td></td>
<td>Video 720p @ 50 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref 720p tri-level sync @ 50 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref 720p tri-level sync @ 25 fps</td>
</tr>
<tr>
<td></td>
<td>Video 720p @ 59.94 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref 720p tri-level sync @ 59.94 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref 720p tri-level sync @ 29.97 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref NTSC &quot;black and burst&quot;</td>
</tr>
<tr>
<td></td>
<td>Video 720p @ 60 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref 720p tri-level sync @ 60 fps</td>
</tr>
<tr>
<td></td>
<td>- Ref 720p tri-level sync @ 30 fps</td>
</tr>
<tr>
<td></td>
<td>Video 480i @ 29.97</td>
</tr>
<tr>
<td></td>
<td>- Ref NTSC &quot;black and burst&quot;</td>
</tr>
</tbody>
</table>
Pinout Information

Introduction
This appendix contains the pinout information for Video Output (2 HD-SDI, 1 RGBHV/YPbPr) option, Video Output (1 RGBHV/YPbPr, 1 Composite) option, Audio Output (Dolby E, AES Digital, Analog) option, Video output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Composite) option, Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp) option.

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## Pinout Information

### Video Output (2 HD-SDI, 1 RGBHV/YPbPr) option and Video Output (1 RGBHV/YPbPr, 1 Composite) option

**DB-15 (RGB / YPbPr)**

<table>
<thead>
<tr>
<th>Pin</th>
<th>RGB</th>
<th>YPbPr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
<td>Pr</td>
</tr>
<tr>
<td>2</td>
<td>Green</td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>Blue</td>
<td>Pb</td>
</tr>
<tr>
<td>4</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>8</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>9</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>10</td>
<td>Ground</td>
<td>Ground</td>
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<tr>
<td>11</td>
<td>--</td>
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</tr>
<tr>
<td>12</td>
<td>--</td>
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<tr>
<td>13</td>
<td>Horizontal Sync</td>
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</tr>
<tr>
<td>14</td>
<td>Vertical Sync</td>
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</tr>
<tr>
<td>15</td>
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<td>--</td>
</tr>
</tbody>
</table>

### Audio Output (Dolby E, AES Digital, Analog) Option

**DB-15 (Audio)**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chan 1 (left) +</td>
</tr>
<tr>
<td>2</td>
<td>Chan 1 (Right) +</td>
</tr>
<tr>
<td>3</td>
<td>Chan 2 (Left) +</td>
</tr>
<tr>
<td>4</td>
<td>Chan 2 (Right) +</td>
</tr>
<tr>
<td>5</td>
<td>Dolby E data (Digital Output 3)</td>
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### Pinout Information

<table>
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<tr>
<th>Pin</th>
<th>Chan 1 (Left)</th>
<th>Chan 1 (Right)</th>
<th>Chan 2 (Left)</th>
<th>Chan 2 (Right)</th>
<th>Ground</th>
<th>Ground</th>
<th>Ground</th>
<th>Ground</th>
<th>Ground</th>
<th>Ground</th>
<th>Ground</th>
<th>Ground</th>
<th>Dolby E ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
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<td>15</td>
<td>Dolby E ground</td>
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### Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Composite) Option and Video Output (2 HD/SD-SDI, 1 RGBHV/YPbPr/Comp) Option

#### DB-15 (RGB / YPbPr / Composite)

<table>
<thead>
<tr>
<th>Pin</th>
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<th>YPbPr</th>
<th>Comp</th>
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<tr>
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</tr>
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<td>3</td>
<td>Blue</td>
<td>Pb</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
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<td>Ground</td>
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<td>Ground</td>
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<tr>
<td>7</td>
<td>Ground</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>8</td>
<td>Ground</td>
<td>Ground</td>
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<tr>
<td>9</td>
<td>--</td>
<td>--</td>
<td>Composite</td>
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<td>Ground</td>
<td>Ground</td>
<td>Ground</td>
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<td>--</td>
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<td>--</td>
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<td>13</td>
<td>Horizontal Sync</td>
<td>--</td>
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</tr>
<tr>
<td>14</td>
<td>Vertical Sync</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>15</td>
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</tr>
</tbody>
</table>
Coordinated Universal Time

Introduction
This appendix contains the coordinated universal time information.

In This Appendix

- Coordinated Universal Time ................................................................. 308
Coordinated Universal Time

-12:00 Eniwetok
-11:00 Midway
-10:00 Hawaii
-09:00 Alaska
-08:00 Pacific
-07:00 Mountain
-06:00 Central
-05:00 Eastern
-04:00 Atlantic
-03:30 Newfoundland
-03:00 Greenland
-02:00 Mid-Atlantic
-01:00 Azores
00:00 Greenwich
01:00 Amsterdam
02:00 Athens
03:00 Baghdad
03:30 Tehran
04:00 Abu Dhabi
04:30 Kabul
05:00 Ekaterinburg
05:30 Calcutta
05:45 Kathmandu
06:00 Amaty
06:30 Rangoon
07:00 Bangkok
08:00 Beijing
09:00 Osaka
09:30 Adelaide
10:00 Brisbane
11:00 Magadan
12:00 Auckland
13:00 Nuku
Introduction

This appendix contains an audio explanation for the D9887B receiver.

In This Appendix

- Audio Setup ......................................................... 312
- Audio Output Settings .............................................. 314
- Digital Audio Measurements ...................................... 315
Audio Setup

There are three primary modes of audio down mix operation for the MPEG-2/MPEG-4 4:2:0 decoders (1 Video, 2 Audio). These settings only affect the signal if the digital output is set to "PCM." It will also affect those embedded audio channels that are set to a PCM down mix.

The modes are "Monitor" (the default setting), "Transmission", and "User."

Note: There are no gain changes if the digital or embedded outputs are set to Raw.

The first mode is "Transmission." It allows no changes by the customer. It is intended to provide a limited dynamic range signal to drive a set-top box or a transmitter. The "Transmission" mode does respond to dialog normalization data. It provides a gain boost of 11 dB and has compression to prevent the signal from overdriving a modulator. The 11 dB gain boost is applied to the analog outputs, AES digital outputs set to PCM, and any embedded outputs set to PCM.

Note: It will not affect the gain of digital outputs or embedded outputs set to Raw.

It is intended to provide a similar audio level as a broadcast TV station signal through an RF modulator. The down mix includes the "center" and "surround" channels if they are present, and is represented as Lt/Rt. (left total/right total)

The second mode is "Monitor." It has moderate processing, no gain boost and its down mix involves left and right channels only (L/R). The compression setting is "Line" mode as the default, but may be changed to "RF", "Custom 0", or "Custom 1." In "Line" mode, the Dolby dialog normalization data is followed. No other parameters may be set by the customer. It is intended for monitoring of sources with only some peak limiting protection. Selecting "RF" as the compression setting will add 11 dB of gain and the same processing as the "Transmission" mode to the analog outputs, AES digital outputs set to PCM, and any embedded outputs set to PCM. The down mix is L/R (left only/right only).

The third mode available is "User." It allows all parameters to be set by the operator. The compression choices are "RF", "Line Mode", "Custom 0", and "Custom 1." RF and "Line Mode" essentially duplicate the first two modes of audio mix down described above. The "Custom 0" and "Custom 1" modes have no audio processing or gain boost. "Custom 1" does enable gain changes called for by the dialog normalization data. It allows the operator to enable or disable the dynamic range (peak limiting) and select the channels to downmix "Lt/Rt", "L/R", "Auto", "Mono L", and "Mono R". Mono left or Mono right applies that signal to both left and right channels of the digital service, left and right channels of the analog outputs, and left and right channels of any embedded stream set to PCM. "Auto" was introduced with Dolby Digital Plus and will select the downmix of Lt/Rt or L/R based on the received audio metadata. If the metadata is not present or Dolby Digital audio is received, Lt/Rt down mixing is used.
"Custom 0" disregards the Dolby dialog normalization data and runs at a fixed gain. Choosing "RF" as the compression mode will increase the gain by 11 dB for the analog outputs, AES digital outputs set to PCM, and any embedded outputs set to PCM.

If you want to run with no processing, set "User / Custom 1 / L/R / Dynamic Range" to disabled. This will still allow gain changes called for in the Dolby metadata.
Audio Output Settings

The digital audio services may be set to "PCM" (AES) or "Raw" as an output. This applies to all available sources. The "PCM" setting will pass an AES stream, or automatically down mix an AC-3 Dolby stream to two channels. "Raw" simply passes thru the Dolby AC-3 data stream to be decoded by an external decoder such as the Dolby 569. The analog channels can be assigned to any of the digital services. The analog gain may be adjusted for the desired level. The gain setting does not affect the level of either the embedded audio or the digital services. A setting of 7 provides an output of approximately 0 dBu for a digital signal level of -20 dBFS. To check the audio output level, set "User / Custom1 / L/R" to disabled. This will remove any signal processing in the down mix. Set the digital service to be measured to "PCM." A test stream of -20 dBFS will output from the digital services as -20 dBFS. If the analog channels are set to a gain setting of 7, the output should be -0.7 dBu plus or minus 0.5 dBu. Each gain number increments or decrements approximately 2.5 dBu per step. When you are setting the output levels, it is suggested that an AC-3 stereo tone (2.0) be used as the source. Do not use a Dolby AC-3 5.1 tone source as your test signal. The five channels of equal tones will down mix such that one channel will be more than twenty dB greater than the other.
Digital Audio Measurements

Digital measurements are made in dBFS, decibels related to Full Scale. The normal operating level of a digital audio system is 20 db below the full digital signal. This full digital signal is the point where there are no more bits to describe a higher level. This would be analogous to clipping in the analog world. Since test tones are set to -20 dBFS, there is 20 dB of headroom in the digital system before the system runs out of bits. To test for maximum level, a 0 dBFS test tone is used.

The dynamic range is read directly by reading how many dBFS below 0 dBFS is the noise. If the signal plus noise is -85 dBFS, then the dynamic range is 85 dB. The same method is utilized for THD measurements. Again, the THD reading in dBFS is read directly on the analyzer. If the amount of distortion is wanted in per cent, it can be calculated from the value in dBFS. For example, -84 dBFS would be equivalent to .0063% distortion.

If there are analog outputs that are delivering the same signal as the digital outputs for a digital source, the normal digital level must be compared to a resulting analog level out of the system. In the D9887B receiver, for a -20 dBFS test tone, the D9887B receiver analog audio outputs deliver a -0.78 dBu level. If a 0 dBFS test tone is used, the analog outputs deliver a +19.98 dBu level. The analog level is adjustable and the levels above result if the analog gain control is set to "7". This is the setting Sencore uses for testing.

The signal to noise in a digital system is measured by stimulating the system with a test tone at -60 dBFS, notching out the tone, and measuring the noise that is left. This measurement is made with the bandpass set by a low pass filter that is slightly below ½ the sampling frequency. In the case of the D9887B receiver, that is ½ of 48 kHz or 24 kHz. Practically, the filter in the analyzer cuts off about 22 kHz. The tone is necessary because the system mutes if it is not receiving a digital signal.

Analog Audio Measurements

The analog audio measurements utilize the same test signals as the digital test with the exception of the THD measurement. The longer setting time of the analog THD analyzer requires a slower frequency sweep test signal. The analog audio signals in the D9887B receiver are derived from the decoded digital audio in the D9887B receiver.
General Audio Setup for Measurements

The D9887B receiver has three primary operation modes that affect the quantity of compression with decoded Dolby Digital signals. All tests are made with the "user" mode of operation. This eliminates any signal compression on Dolby Digital signals downmixed in the D9887B receiver. This mode has no effect on PCM encoded audio (AES). The analog output gain is set to "7" for all tests. This results in a level of approximately -0.7 dBu for a digital input level of -20 dBFS. This would be the operating level of the D9887B receiver's analog outputs for a standard digital signal.
Open Source Software

Introduction
This appendix contains the open source information for the D9887B receiver.

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- D9887B Open Source .......................................................... 318
D9887B Open Source

binutils 2.15
Copyright (c) 2002, 2003 Free Software Foundation, Inc.
All rights reserved.

busybox 1.8.2
Portions of this code are respectively:
Copyright (c) 1989, 1991 Free Software Foundation, Inc.
Copyright (c) 2004 – 2005 Intel Corporation.
All rights reserved.

linux 2.6.15
Portions of this code are respectively:
Copyright (c) 1989, 1991 Free Software Foundation, Inc.
Copyright (c) 2004 – 2005 Intel Corporation.
All rights reserved.

log4cpp 0.3.5 rc3
Copyright (c) 2000 – 2002 LifeLine Networks bv.
Copyright (c) 2000 – 2002 Bastiaan Bakker.
All rights reserved.

MD5.c
Copyright (c) 1991 – 1992 RSA Data Security, Inc.
All rights reserved.

MD5.h
Copyright (c) 1991 – 1992 RSA Data Security, Inc.
All rights reserved.

module_init_tools 3.2
Copyright (c) 1989, 1991 Free Software Foundation, Inc.
Copyright (c) 2002 Rusty Russell IBM Corporation.
All rights reserved.

newlib 1.15.0
Portions of this code are respectively:
Copyright (c) 1994 – 2006 Red Hat, Inc.
Copyright (c) 1981 – 2000 The Regents of the University of California.
Copyright (c) 1991 by AT&T.
Copyright (c) 1998-2001 by Lucent Technologies.
Copyright (c) 1989, 1990 Advanced Micro Devices, Inc.
Copyright (c) 1993 C.W. Sandmann.
Copyright (c) 1992 Eric Backus.
Copyright (c) by Sun Microsystems, Inc.
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Copyright (c) 2000, 2001 Alexey Zelkin.
Copyright (c) 1997 by Andrey A. Chernov, Moscow, Russia.
Copyright (c) 1997 – 2002 FreeBSD Project.
Copyright (c) 1984, 2000 S.L.
Appendix F
Open Source Software

All rights reserved.
Introduction

This appendix contains compliance information for the D9887B receiver.

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- Compliance .......................................................... 322
- Declaration of Conformity ....................................... 323
Compliance

FCC Notices

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits exist to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with this instruction manual may cause harmful interference in which case the user at his own expense must take whatever measures may be required to correct the interference.

Shielded cables should be used to interconnect this unit with any peripheral equipment (i.e., data sources, terminals, monitors, etc.) to ensure compliance with Class A limits. Failure to do so may result in radio or TV interference.

Industry Canada Notice

This digital apparatus does not exceed the limits for Class A radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le present appareil numerique n’emet pas de bruites radioelectriques qui depassant les limites applicables aux appareils numeriques de Class A prescrites dans le reglement sur le brouillage radioelectrique edicte par le Ministre des Communications du Canada.

Unauthorized Modifications

The manufacturer is not responsible for any radio or TV interference resulting from unauthorized modifications made to this equipment. It is the responsibility of the user to correct such interference at his own expense.
Declaration of Conformity

DECLARATION OF CONFORMITY
with regard to the Directives 2006/95/EC (LVD) and 2004/108/EC (EMC)

Cisco Systems Inc & all its affiliates
Headquarters:
170 West Tasman Drive
San Jose, CA 95134 - USA

Declare under our sole responsibility that the product,

Brand name: Cisco
Model number: D9887 / D9887B
Model name: HDTV Modular Receiver

Fulfills the essential requirements of the Directives 2006/95/EC and 2004/108/EC.

With regard to the Directives 2006/95/EC and 2004/108/EC, the following standards were applied:

Number and Date of Issue | Title of Standard
--- | ---
EN 60065:2002/A11:2008 | Safety requirements for mains operated electronic and related apparatus for household and similar general use
ClAss A
EN 61000-3-2:2001 | Electromagnetic Compatibility - Part 3: Limits Section 2: Limits for Harmonic Current Emissions (Equipment Input Current less than 16A per phase)

The product carries the CE Mark, which was first affixed in 2006:

Date & Place of Issue: 1 December 2010, Scarborough ON, Canada

Signature: [Signature]

EU Authorized Representative:
Edvard Vangrael
Cisco Systems Belgium
De Kemelaar 0-A
B 1831 Diegem - Belgium

D9887_Cisco_DM01_EU_DOC1.doc
Glossary

16VSB
Vestigial sideband modulation with 16 discrete amplitude levels.

8VSB
Vestigial sideband modulation with 8 discrete amplitude levels.

AAC
Advanced Audio Coding

AC-3
Also known as Dolby Digital.

AES
Audio Engineering Society

ASI
Asynchronous Serial Interface

ATSC
Advanced Television Systems Committee

AV
Audio Video

Bit Rate
The rate at which the compressed bit stream is delivered from the channel to the input of a decoder.

BNC
British Naval Connector
Glossary

BPS
Bits per second.

CAT
Conditional Access Table

CAT6
Category 6 – Cable standard for gigabit Ethernet

CC
Closed Caption

CoP
Code of Practice

CRC
Cyclic Redundancy Check

CVCT
Cable Virtual Channel Table

DHCP
Dynamic Host Configuration Protocol

DTVCC
Digital Television Closed Captioning

DVB
Digital Video Broadcasting

EBU
European Broadcasting Union

EIA
Electronic Industries Alliance
**Event**

An event is defined as a collection of elementary streams with a common time base, an associated start time, and an associated end time.

**Field**

For an interlaced video signal, a “field” is the assembly of alternate lines of a frame. Therefore, an interlaced frame is composed of two fields, a top field and a bottom field.

**Frame**

A frame contains lines of spatial information of a video signal. For progressive video, these lines contain samples starting from one time instant and continuing through successive lines to the bottom of the frame. For interlaced video a frame consists of two fields, a top field and a bottom field. One of these fields will commence one field later than the other.
Glossary

High level
A range of allowed picture parameters defined by the MPEG-2 video coding specification which corresponds to high definition television.

I/O
Input/Output

IP
Internet Protocol

LED
Light Emitting Diode

LNB
Low-Noise Block

MAC
Medium Access Control

Main level
A range of allowed picture parameters defined by the MPEG-2 video coding specification with maximum resolution equivalent to ITU-R Recommendation 601.

Main profile
A subset of the syntax of the MPEG-2 video coding specification that is expected to be supported over a large range of applications.

Mbps
1,000,000 bits per second.

MER
Modulation Error Ratio

MGT
Master Guide Table

MIB
Management Information Base
MP@HL
Main profile at high level.

MP@ML
Main profile at main level.

MPEG
Refers to standards developed by the ISO/IEC JTC1/SC29 WG11, Moving Picture Experts Group. MPEG may also refer to the Group.

MPEG-2
Refers to ISO/IEC standards 13818-1 (Systems), 13818-2 (Video), 13818-3 (Audio), 13818-4

MPTS
Multiprogram Transport Stream

NTSC
National Television System Committee

OSD
On Screen Display

PAL
Phase-Alternating Line

PAT
Program Association Table

PCM
Pulse-Code Modulation

PCR
Program Clock Reference

PID
Packet Identifier. A unique integer value used to associate elementary streams of a program in a single or multi-program transport stream.
Glossary

PMT
Program Map Table

Profile
A defined subset of the syntax specified in the MPEG-2 video coding specification.

Program
A program is a collection of program elements. Program elements may be elementary streams. Program elements need not have any defined time base; those that do have a common time base and are intended for synchronized presentation.

Program specific information (PSI)
PSI consists of normative data which is necessary for the demultiplexing of transport streams and the successful regeneration of programs.

PTS
Presentation Time Stamp

QAM
Quadrature Amplitude Modulation

QPSK
Quadrature Phase-Shift Keying

RDS
Receiver Decoder System

RF
Radio Frequency

RGBHV
Red, Green, Blue, Horizontal, Vertical

RO
Read Only

RPM
Revolutions Per Minute
RRT
Rating Region Table

RS-232
Recommended Standard. A standard for serial binary data interconnection.

RU
Rack Unit

RW
Read/Write

SD
Standard Definition

SDI
Serial Digital Interface

SFP
Small Form-Factor Pluggable

SI
System Information

SMPTE
Society of Motion Pictures and Television Engineers

SNMP
Simple Network Management Protocol

SSRC
Synchronization Source

STD
System Target Decoder. A hypothetical reference model of a decoding process used to describe the semantics of the Digital Television Standard multiplexed bit stream.
Glossary

STD input buffer
A first-in, first-out buffer at the input of a system target decoder for storage of compressed data from elementary streams before decoding.

STT
System Time Table

TS
Transport Stream

TVCT
Terrestrial Virtual Channel Table

UTC
Coordinated Universal Time

VANC
Vertical Ancillary

VCT
Virtual Channel Table. Used in reference to either TVCT or CVCT.

XLR
Cannon “X” series connector, with a Latch, and Rubber around the contacts.

YPbPr
Component Red, Green, Blue
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