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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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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 are 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.
11. Only use attachments/accessories specified by the manufacturer.
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 (DU Tipping Cart Symbol “”).
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. Outdoor Antenna Grounding – If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

16. Lightning – For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power line surges.

17. Power Lines – An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

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!

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>⚠️</td>
<td>You will find this symbol on the product and/or in the literature that accompanies this product. It indicates important operating or maintenance instructions.</td>
</tr>
<tr>
<td>⚠️</td>
<td>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.</td>
</tr>
</tbody>
</table>
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.
• To reduce the risk of electric shock, disconnect power cord before servicing.
• 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 rear 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 disconnect all power cables before servicing this product.
• 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.

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.

<table>
<thead>
<tr>
<th>Symbole</th>
<th>Explication</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Exclamation]</td>
<td>Ce symbole figure dans la documentation accompagnant ce produit. Il indique d'importantes instructions de fonctionnement ou d'entretien.</td>
</tr>
<tr>
<td>![Exclamation]</td>
<td>Ce symbole peut être attaché à ce produit. Il indique une borne sous tension; la direction indique la borne.</td>
</tr>
<tr>
<td>![Exclamation]</td>
<td>Ce symbole peut être attaché à ce produit. Il indique une borne de terre de protection.</td>
</tr>
<tr>
<td>![Exclamation]</td>
<td>Ce symbole peut être attaché à ce produit. Il indique une température excessive ou dangereuse.</td>
</tr>
</tbody>
</table>

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'ouvez pas l'enceinte de ce produit, sauf instructions contraires.
- Ne forcez pas d'objets dans les ouvertures du boîtier.

Câbles

- Débranchez toujours tous les cordons d'alimentation avant de réparer ce produit.
- 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!

• Dieses Gerät entspricht internationalen Sicherheits- und Ausführungsstandards. Beachten Sie alle in diesem Handbuch enthaltenen Sicherheitshinweise sowie die am Gerät angebrachten Warnzeichen.

• 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!

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Bemerkung</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbol]</td>
<td>Wenn dieses Zeichen am Gerät angebracht ist, warnt es vor einer spannungsführenden Stelle.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>Dieses Symbol kennzeichnet auf dem Gerät die Anschlußstelle der Sicherheitserde.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>Wenn dieses Zeichen am Gerät angebracht ist, warnt es vor heißen Stellen, die zu Verbrennungen führen können.</td>
</tr>
</tbody>
</table>

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

- Siempre desconectar todos los cables eléctricos antes de revisar o reparar el producto.
- 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!

<table>
<thead>
<tr>
<th>Simbolo</th>
<th>Descrizione</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Simbolo 1" /></td>
<td>Questo simbolo, che appare nella letteratura di accompagnamento del prodotto, indica importanti istruzioni d'uso e di manutenzione.</td>
</tr>
<tr>
<td><img src="image" alt="Simbolo 2" /></td>
<td>Sul prodotto potete vedere questo simbolo che indica un dispositivo terminale sotto tensione; la freccia punta verso il dispositivo.</td>
</tr>
<tr>
<td><img src="image" alt="Simbolo 3" /></td>
<td>Potrete trovare il presente simbolo applicato a questo prodotto. Questo simbolo indica un terminale protettivo di messa a terra.</td>
</tr>
<tr>
<td><img src="image" alt="Simbolo 4" /></td>
<td>Potrete trovare il presente simbolo attaccato a questo prodotto. Questo simbolo indica un calore eccessivo o pericoloso.</td>
</tr>
</tbody>
</table>

Alimentazione

- Importante! Questo prodotto è di Classe I. Va messo a terra.
• 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

• Staccare sempre tutti i cavi di alimentazione prima di svolgere l'assistenza tecnica al prodotto.

• 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.

Riparazione di fabbrica

• Per le riparazioni contattate solamente personale tecnico autoizzato dalla fabbrica.
Preface

This section describes the audience and conventions of the Cisco D9800 Network Transport Receiver Installation and Configuration Guide. It also references related documentation and describes how to obtain documentation and submit a service request.

- Audience, on page xxiii
- Document Revision History, on page xxiii
- Conventions, on page xxiv
- Related Documentation, on page xxv

Audience

The audience of this manual includes users (operators) and service personnel who are responsible for the installation, configuration, operation, monitoring and service of the D9800 receiver.

Document Revision History

The table below describes information that has been added or changed since this guide was last published.

<table>
<thead>
<tr>
<th>Software Version</th>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.25</td>
<td>April 2018</td>
<td>Added license rehost feature in Rehosting Software Licenses section, added Viewing Transcoder Status section, added Resetting the Login Credentials section, and updated the following sections to include HEVC transcoding: Viewing Hardware Features and Software License, Configuring the Transcoder Settings, and Configuring the HD and SD Transcode Settings.</td>
</tr>
<tr>
<td>3.11</td>
<td>March 2018</td>
<td>Added MOIP and Zixi input disaster recovery on multi-stream units in the Disaster Recovery section, and added DR Status column in Viewing the IP Input Status and Viewing the Zixi Input Status sections.</td>
</tr>
</tbody>
</table>
### Conventions

This guide uses the following conventions.

<table>
<thead>
<tr>
<th>Conventions</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bold font</strong></td>
<td>Commands and keywords and user-entered text appear in bold font.</td>
</tr>
<tr>
<td><strong>italic font</strong></td>
<td>Document titles, new or emphasized terms, and arguments for which you supply values are in italic font.</td>
</tr>
<tr>
<td>[]</td>
<td>Elements in square brackets are optional.</td>
</tr>
<tr>
<td>{x</td>
<td>y</td>
</tr>
<tr>
<td>[x</td>
<td>y</td>
</tr>
<tr>
<td>string</td>
<td>A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.</td>
</tr>
<tr>
<td><strong>courier font</strong></td>
<td>Terminal sessions and information the system displays appear in courier font.</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>Nonprinting characters such as passwords are in angle brackets.</td>
</tr>
<tr>
<td>[]</td>
<td>Default responses to system prompts are in square brackets.</td>
</tr>
<tr>
<td>!, #</td>
<td>An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.</td>
</tr>
</tbody>
</table>

---

**Note**

Means reader take note. Notes contain helpful suggestions or references to material not covered in the manual.

**Caution**

Means reader be careful. In this situation, you might perform an action that could result in equipment damage or loss of data.
Warning

IMPORTANT SAFETY INSTRUCTIONS

Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Related Documentation


CHAPTER 1

Installing the D9800 Network Transport Receiver

This section contains the information for technicians installing the Cisco D9800 Network Transport Receiver.

⚠️ Warning
Allow only authorized and qualified service personnel to install, operate, maintain, and service this product. Otherwise, personal injury or equipment damage may occur.

- Safety Guidelines, on page 1
- Mounting a D9800 Receiver to a Rack, on page 2
- Rear Connector Panels, on page 2
- Connecting AC Power to the D9800 Receiver, on page 5
- Connecting to the Satellite Input, on page 5
- Connecting the Input/Output Signals, on page 6
- External Alarm System Connector, on page 8
- Connecting the Ethernet Management Interface, on page 10
- Viewing the Hardware Information, on page 10

Safety Guidelines

This section describes general safety guidelines prior to installing and connecting the D9800 receiver.

Cooling

The unit is cooled by the use of internal fans. The air intake is from the front and the air outlet is on the rear.

⚠️ Caution
The inlet air temperature must not exceed 50°C/122°F at any time.

Grounding or Earthing

You must ensure that the unit is properly connected to ground to meet safety and EMC requirements. Before any other connection is made, the unit must be connected to protective Ground or Earth via the three wire power cord of the AC power supply. This connection is mandatory.
Equipotential Bonding

If this equipment is equipped with an external chassis terminal marked with the IEC 5018 chassis icon (.utf8), the installer should refer to CENELEC standard EN 50083-1 or IEC standard IEC 60728-11 for correct equipotential bonding connection instructions.

Elevated Operating Ambient Temperature

Only install this equipment in a humidity- and temperature-controlled environment that meets the requirements given in this equipment's technical specifications.

Caution

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install this equipment in an environment compatible with the manufacturer's maximum rated ambient temperature.

Mounting a D9800 Receiver to a Rack

The D9800 receiver is a 1U unit with connector access at the rear panel. The receiver is intended for mounting in a standard 19” rack.

The D9800 receiver is vented from front to back. Multiple units can be stacked in a rack, provided that adequate cooling is available.

Make sure that the rack is placed on a stable surface. If the rack has stabilizing devices, install these stabilizing devices before mounting any equipment in the rack.

Caution

Avoid personal injury and damage to this equipment. Mounting this equipment in the rack should be such that a hazardous condition is not caused due to uneven mechanical loading.

Step 1
Mount L-brackets or equivalent shelving in the rack to support each unit to be installed.

Step 2
Place the receiver in its position in the rack.

Step 3
Mount the receiver securely to the rack by securing the mounting flanges to the rack using four screws.

Step 4
Ensure that the air outlet holes on the back of the receiver are not obstructed to allow air flow from the front to the back of the chassis.

Rear Connector Panels

The diagram below shows the rear connector panel of the D9800 base chassis with ASI and MPEGoIP Input/Output (D9800-SS-MPEGOIP), with SDI (D9800-3G-SDI) and four port satellite input card (D9800-SAT-GEN1) options installed.
The diagram below shows the rear connector panel of the D9800 Multi-Stream chassis with ASI and MPEGoIP (D9800-MS-MPEGOIP), with D9800-SAT-GEN1 option.

The table below describes the function and type of the various connectors.

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF1 to RF4</td>
<td>Each input accepts an LNB signal input. RF1 provides LNB power for use when no external LNB power source is available. RF2 to RF4 require an external LNB power source.</td>
<td>F</td>
</tr>
<tr>
<td>AES1 and AES2</td>
<td>These are AES-3id outputs. One output for each stereo channel.</td>
<td>BNC</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> This is only available on single-stream units with the SDI option installed (D9800-3G-SDI).</td>
<td></td>
</tr>
<tr>
<td>AUD 1&amp;2 and AUD 3&amp;4 (Balanced Audio Outputs)</td>
<td>Audio 1&amp;2 and Audio 3&amp;4 provide two stereo pairs or four mono channels.</td>
<td>Terminal Blocks</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> The AUD 3&amp;4 outputs are only available on single-stream units with the SDI option installed (D9800-3G-SDI).</td>
<td></td>
</tr>
<tr>
<td>SDI 1 and SDI 2</td>
<td>The SDI outputs provide serial digital video with embedded audio output for applications. The following lists the supported SDI standards:</td>
<td>BNC</td>
</tr>
<tr>
<td></td>
<td>• HD-SDI (SMPTE-292M)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• SD-SDI (SMPTE ST 259)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3G-SDI (SMPTE ST 424)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> This is only available on the single-stream units with the SDI option installed (D9800-3G-SDI).</td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>Description</td>
<td>Type</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>CVBS (Composite Video Output)</td>
<td>The composite video output provides one SD composite video output for monitoring applications and downstream equipment. Note: This is available on the single-stream units only.</td>
<td>BNC</td>
</tr>
<tr>
<td>HDMI</td>
<td>The HDMI output is for monitoring purposes only. Note: This is available on the single-stream units only.</td>
<td>HDMI Type A receptacle (female)</td>
</tr>
<tr>
<td>ASI IN and ASI OUT (D9800-SS)</td>
<td>Asynchronous Serial Interface (ASI) input and/or output ports. The single-stream units have one ASI input port and one ASI output port. The multi-stream units have two ASI input and/or output ports.</td>
<td>BNC</td>
</tr>
<tr>
<td>ASI I/O 1 and ASI I/O 2 (D9800-MS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cue Tone/Cue Trigger Relay Output</td>
<td>Program relay provides programmed responses for alarms, cue trigger states for ad-insertion equipment, or a cue tone output for connection to ad-insertion equipment. Note: This is available on the single-stream units only.</td>
<td>15-pin sub-D female</td>
</tr>
<tr>
<td>USB</td>
<td>This is not supported in the current release.</td>
<td>—</td>
</tr>
<tr>
<td>Management</td>
<td>Supports the following network protocols: SSH, HTTPS, SNMP, Syslog, and NTP.</td>
<td>RJ-45</td>
</tr>
<tr>
<td>DATA1 and DATA2 (D9800-SS)</td>
<td>This is for MPEGoIP and MPE outputs. The MPEGoIP output transmits the transport stream encapsulated in IP packets to a groomer for distribution. The MPEGoIP input receives its streams from the terrestrial IP network.</td>
<td>RJ-45</td>
</tr>
<tr>
<td>DATA1 to DATA4 (D9800-MS)</td>
<td>This is for MPEGoIP and MPE outputs. The MPEGoIP output transmits the transport stream encapsulated in IP packets to a groomer for distribution. The MPEGoIP input receives its streams from the terrestrial IP network.</td>
<td>RJ-45</td>
</tr>
<tr>
<td></td>
<td>The MPE output receives and outputs the IP data packets from the incoming transport stream. This is only available on single-stream units (D9800-SS).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D9800-SS: The DATA1 and DATA2 ports are for the single-stream units with MPEGoIP input and output option installed (D9800-SS-MPEGOIP). DATA1 and DATA2 are redundant data ports.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D9800-MS: The multi-stream units (D9800-MS-MPEGOIP) have four IP data ports (DATA1, DATA2, DATA3, and DATA4). DATA1 and DATA2, and DATA3 and DATA4 are redundant ports.</td>
<td></td>
</tr>
<tr>
<td>Ground/Earth</td>
<td>A grounding/earthing point for the receiver for equipotential bonding (not Safety).</td>
<td>Nut on Stud</td>
</tr>
<tr>
<td>Power</td>
<td>Connects the receiver to an AC power source.</td>
<td>Receptacle: IEC 60320 Sheet 14</td>
</tr>
</tbody>
</table>
Connecting AC Power to the D9800 Receiver

To operate the receiver, you must connect it to an AC power source. The units are designed for continuous operation and do not have a power switch. The mains cord and/or DC power supply cable serve(s) as the mains disconnect device.

The unit is equipped with one power supply located in the rear of the chassis.

The power cord (consisting of appliance coupler, flexible cord, and plug) supplied with this product meets the requirements for use in the country for which this product was purchased. In general, the power cord must be approved by an acceptable, accredited agency responsible for evaluation in the country where the product will be used.

⚠️ Caution
Ensure that at least one end of the power cable(s) remains easily accessible for unplugging, if you need to switch off the unit. For example: Ensure that the socket outlet is installed near the product.

⚠️ Caution
To avoid electrical shock, connect the three-prong plug on this product to an earth-grounded three-pin socket outlet only.

---

**Step 1**
Connect the power cord (supplied with the unit) between the rear panel power receptacle and a 100 to 120/200 to 240 V AC, 50/60 Hz power outlet.

**Step 2**
Ensure that the power cable is connected to protective ground. See Grounding or Earthing, on page 1.

The Application Starting message appears on the front panel. The boot process, for a unit with a typical configuration, may take up to two to three minutes to initialize. When ready, the front panel displays the startup screen.

---

Maintenance of EMC Compliance

For EMC protection, shielded cables must be used. Double-shielded (braid/foil or braid/braid) cables should be used for all ASI I/O, CVBS, SDI, and RF inputs. Single-shield cables are acceptable for all other inputs and outputs (AES audio, Ethernet). For Audio terminal block and Cue I/O, no shielding is required.

---

Connecting to the Satellite Input

**Step 1**
Set the 22 kHz signal and the output voltage, as required.

**Step 2**
Connect the ASI OUT port to an ASI device for digital tier applications.
Connecting the Input/Output Signals

This section describes how to connect the RF inputs, ASI input, ASI output, video outputs, and audio outputs.

Connecting the RF Inputs

Connect up to four LNB RF cables to the RF connectors labeled RF1 through RF4 on the rear of the unit. Use 75-ohm (braid/foil or braid/braid), low insertion loss coaxial cable. Each input accepts an LNB signal input. RF2 to RF4 require an external LNB power source.

Connecting the ASI Input

If desired, connect to the ASI IN port to an asynchronous serial interface for uplink monitoring.

Connecting the Video Outputs

The video output connectors are of the BNC type. The interface type is SMPTE-292M and the connector type is BNC female.

Connecting the Composite Video Output

Connect a video monitor to the CVBS connector. Use a 75-ohm double-braided coax cable.

Connecting the SDI Outputs

Connect rebroadcast equipment to the connectors labeled SDI1 and SDI2, and/or if required, connect them to a video monitor.

Connecting the HDMI Output

Connect the video monitor to the HDMI connector. Use a HDMI Type A receptacle (female) connector.

Connecting the Audio Outputs

This section describes how to connect digital and balanced audio outputs.

Connecting the Digital Audio Outputs

The configuration of the D9800 receiver outputs two stereo channels. The receiver also supports encoding of audio embedded in the SDI video signal. The Interface type is AES-3id and the connector type is BNC female.

Note

The digital audio output is always 75-ohm single-ended.
Connecting the Balanced Audio Output

**Step 1**  
Each row of the terminal blocks has a removable plug. Press down on the appropriate spring loaded terminal release detent on the plugs and insert wire as required. Release the detent to secure wire.

**Step 2**  
Connect the AUD1 and AUD 2 and AUD 3 and AUD 4 balanced audio outputs to monitoring equipment and/or downstream equipment. Use a multi-conductor, pluggable cable from the audio 1, 2, 3, and 4 of the receiver (Left and Right) terminals to your equipment, as shown below.

*Figure 3: Balanced Audio Output Terminal Block Connector*

![Balanced Audio Output Terminal Block Connector](image)

*Note*  
Audio 3 and 4 requires the SDI option (D9800-3G-SDI).

---

Connecting the IP TS Input/Output

The RJ-45 interface DATA1 and DATA2, and DATA3 and DATA4 (on multi-stream units only) are 100/1000BASE-T Ethernet connectors. They are intended for the MPEGoIP input and output. The MPEGoIP output of the transport stream is encapsulated in the IP packets to a groomer for distribution.

*Note*  
For reliable Ethernet operation; to run over a maximum segment length of 100 m and up to 100BASE-T, the cable has to comply with the EIA/TIA Category 5 (or higher) wire specifications, and for 1000BASE-T, Category 6 is required.

*Note*  
Connect an RJ-45 cable between the Ethernet connector (DATA port only) on the D9800 receiver and the Ethernet port of the equipment after the D9800 receiver. The equipment after the D9800 receiver could be an IP router or a switch.
Connecting the ASI Output

Connect the output signal from the D9800 receiver ASI OUT connector.

Use a Belden “Brilliance” cable (or equivalent) with foil/braid construction. The shield must provide 99% or better shielding effectiveness.

External Alarm System Connector

The Alarm output connector is a 15-pin sub-D female connector. The connector pin states depend on the selected Relay Mode.

Changing the Relay Mode for Alarm Monitoring

The Alarm relay is a program relay that can be configured to provide programmed responses for alarms, warnings, and cue trigger states for ad insertion equipment. As a default, the Alarm Relay is configured for Alarm mode.

Note

The cue tone or cue trigger interface is available on single-stream units only.

Step 1

From the Main Menu of the D9800 front panel, choose Setup > Outputs > Cueing > Relay Mode.

Step 2

Choose Alarm.

Step 3

Save your changes. The rear panel connector pin states will change to that shown in the table below for Alarm mode.

<table>
<thead>
<tr>
<th>Connector</th>
<th>Closed in Normal Operation</th>
<th>Common Pin</th>
<th>Open in Normal Operation</th>
<th>Relay Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 15</td>
<td>11 15</td>
<td>10 11</td>
<td>15</td>
<td>Trigger</td>
</tr>
<tr>
<td></td>
<td>11 15</td>
<td>10 11</td>
<td>11</td>
<td>Alarm (default)</td>
</tr>
</tbody>
</table>

Note

A normally closed state implies the state when power is applied to the relay in a normal operating state, without a trigger or alarm condition present.

Cue Tone/Cue Trigger Interface

The D9800 receiver is equipped with a connector labeled Cue Tone/Relay for alarm relay outputs for remote alarm signaling. This connector provides Cue Tone, Cue Trigger, and Alarm relay functionality. These outputs are user-configurable via the Setup Menu on the front panel.
The connector is a 15-pin sub-D female connector, with the voltage and current of SV Vmax 30 mA max. The following table shows the connector and the pin allocation table for Cue Tone, Cue Trigger, and Alarm relay connections.

<table>
<thead>
<tr>
<th>Connector</th>
<th>Pin</th>
<th>Pin Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Cue Trig 1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Cue Trig 2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Cue Trig 3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Cue Trig 4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Cue Trig 5</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Cue Trig 6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Cue Trig 7</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Cue Trig 8</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Not connected</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Alarm/Relay - Common</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Alarm/Relay - Normally open</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Chassis ground</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Cue Tone -</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Cue Tone +</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Alarm/Relay - Normally closed</td>
</tr>
</tbody>
</table>

**Connecting the Cue Tone Interface**

Connect the Cue Tone pins, 13 and 14 to a device to facilitate ad-insertion using DTMF Analog Cue Tones.

**Connecting the Cue Trigger Interface**

Connect the Cue Trigger pins (1 to 8) to up to 8 serial control devices or a device to control ad-insertion. These outputs are user-configurable on the front panel menu.

**Configuring Open-collector Outputs**

The D9800 supports decoding of SCTE-35 messages with DTMF descriptor. The D9800 outputs tones or sets the open collector contacts according to the content of the DTMF descriptor in the Cisco D9036 Modular Encoding Platform. For information on the open-collector output settings, see the *Cisco D9036 Modular Encoding Platform Installation and Configuration Guide*. 
Connecting the Ethernet Management Interface

The RJ-45 interface for 100/1000BASE-T Ethernet is currently intended for upgrading/downloading the software application. The Ethernet Management port supports the following network protocols: SSH, HTTPS, SNMP, Syslog, and NTP. You must set up the IP address, the default gateway and the subnet mask to match the network connection. This is done through the front panel menu (Setup > IP > IP).

Note

Proper cables are required for reliable Ethernet operation; to run up to a maximum segment length of 100 m and up to 100BASE-T, the cable has to comply with the EIA/TIA Category 5 (or higher) wire specifications, and for 1000BASE-T, Category 6 is required. For EMC protection, shielded cables must be used.

Step 1  Connect an RJ-45 cable between the Ethernet connector on the D9800 receiver and the Ethernet port of your PC.
Step 2  Set up the IP address on the D9800 receiver via the front panel display (Setup > IP > IP).

Viewing the Hardware Information

From the D9800 web GUI, choose System Settings > Identification, or from the Main Menu of the D9800 front panel, choose About > General.

The Hostname field or front panel menu allows you to set the name of the current unit. It appears on the web GUI title to identify the receiver.

The remaining fields or front panel menus display the unit information, such as serial number, model number, and port addresses.

The following icons are displayed in the User Address field:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Icon]</td>
<td>Indicates that the blue UA (master UA) matches the EEPROM or repair location in SPI Flash. Otherwise, it displays a red X.</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Indicates that the UA was used to create the X.509 certificate, which enables security features and establishes a secure session. If a certificate symbol is not displayed, it indicates that the X.509-enabled features, such as VideoGuard smart cards and license re-hosting, are not available. License re-hosting allows you to initiate license transfers. For more information, see Rehosting Software Licenses, on page 35.</td>
</tr>
<tr>
<td>![Icon]</td>
<td>The ISE block signature is validated.</td>
</tr>
<tr>
<td>![Icon]</td>
<td>The ISE block validation has failed or is missing.</td>
</tr>
</tbody>
</table>
Upgrading the D9800 Network Transport Receiver

This section describes how to upgrade the D9800 Network Transport Receiver.

- Setting the Front Panel Download Mode, on page 11
- Downloading and Installing the D9800 Software, on page 12
- Viewing the Download Information, on page 12

Setting the Front Panel Download Mode

**Step 1**
From the Main Menu of the D9800 front panel, choose **Setup > Admin > DL Mode**.

**Step 2**
Press the up and down arrow keys to set the unforced over-the-air download mode.

- **Always** - Accepts all unforced downloads and saves setting in memory.
- **Once** - Accepts an unforced download once, followed by a reboot of the receiver, and the DL Mode will automatically change to **Never**.
- **Never** - Refuses all unforced downloads.

**Note**
Forced downloads (initiated by the uplink) are always accepted and always result in a reboot of the receiver. Service interruption will occur.

Stopping an Over-The-Air Download

**Step 1**
From the Main Menu of the D9800 front panel, choose **Setup > Admin > Command**.

**Step 2**
Press up and down to choose a command to issue to the current download. This command is for over-the-air downloads only. It has no effect on the rear panel or HTTP downloads.

- **Abort** - Stops receiving a current download.
- **Restart** - Restarts a previously aborted download. The download does not resume from where it was aborted, but restarts from the beginning.
- **None** - No action is performed.
**Downloading and Installing the D9800 Software**

- **Important** If you are upgrading the D9800 Network Transport Receiver Version 1.06 or earlier to Version 2.00 or later, you must upgrade to Version 1.55 first. After the unit reboots and initializes the software, you can then upgrade to Version 2.00 or later. This is applicable to single-stream units only.

  If you do not follow the specific installation sequence, the Version 2.00 or later software download will fail and the unit will continue to run the version it was in, prior to the download.

---

**Step 1**
From the D9800 web GUI, choose **Support > Service Actions**.

**Step 2**
In the **APP/License Downloads** area, click **Browse** and choose the new version of the software application.

**Step 3**
Click **Download** to download the selected upgrade file. The file format that can be downloaded is Application CDT.

During the upgrade, you can click **Return to Browser** (not recommended) to return to the web browser. The application download continues. We do not recommend that you interrupt the upgrade during the application download. Click **Download Status Toggle** to toggle the download data update between the web GUI and an external device.

The **Download Verification** field displays the status of the last download.

For application downloads, once the download is complete, the unit will reboot automatically.

---

**Installing a Preloaded Software Version**

**Step 1**
From the D9800 web GUI, choose **Support > Service Actions**.

**Step 2**
From **S/W Version** drop-down list, choose a different application version for the receiver.

**Step 3**
Click **Select & Reboot** to load the selected application version and reboot the receiver.

**Note** To remove the selected application version, click **Erase**. You will be prompted to continue or not. Click **OK** to continue the deletion.

---

**Viewing the Download Information**

The current software download information, such as the download status and the download type, is displayed on the front panel (**Setup > Admin**). The table below lists the download information displayed.

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit Version</td>
<td>Indicates the oldest version of the application that can be installed on the current unit. Older applications will not be installed.</td>
</tr>
</tbody>
</table>
## Menu Item | Description
---|---
**DL Status** | Indicates the current download state.  
- **Init** - Download component is being initialized. You cannot perform a download while in this state.  
- **Ready** - Download component is ready to receive downloads.  
- **Buffer** - Download in progress. The CDTs are being received.  
- **Program** - The application is being written to flash.  
- **Swap** - The unit is swapping to a new application and it will reboot.  
- **Shutdown** - The unit is shutting down and it will reboot.  
- **App Erase** - An application is being erased from the flash.

**Type** | Displays the type of download being performed.  
- **None** - No download is being performed.  
- **HTTP** - An HTTP download from the web GUI is being performed.  
- **Over Air** - An over-the-air download is being performed.

**Bank** | Indicates the type of code being downloaded.

**CDT#** | Indicates the total number of expected code tables in the current download.

**Recv** | Displays the number of code tables received since the last completed or aborted download, or power-cycle.

**Reject** | Displays the number of code tables rejected. Tables are rejected whenever validation fails due to things like CRC failure or incorrect code or receiver type.

The **Download Status** area of the web GUI (Support > Service Actions) displays the current status of the downloads. The **State** field displays the progress of the download. When the download is complete, a Successfully Completed message is displayed. Click **History** to display the download history.
Viewing the Download Information
CHAPTER 3

Getting Started

This section describes how to use the D9800 Network Transport Receiver front panel and web GUI, as well as how to initially set up the D9800 receiver. There are two ways to configure the D9800 unit: front panel and web GUI. For example, changes made through the front panel is reflected on the web GUI, and vice versa.

• About the Front Panel, on page 15
• Logging on to the D9800 Web GUI, on page 20
• Basic Vs. Advanced Mode, on page 23
• Quick Setup, on page 24

About the Front Panel

You can use the controls and indicators on the front panel to operate the D9800 receiver. These include the numeric keypad, the navigation or selection keypad, the LCD, the alarm and signal indicators. These are shown in the following illustration.

Figure 4: D9800 Front Panel

LCD

The LCD provides information on the selections available at any menu level, current settings for parameters, and certain status and alarm indications. This is a 2x40, backlit LCD display. The top line may be status data or identifier information. It can also display optional functions available for tuning operations. The bottom line will show selections or parameter values available using the navigation/selection keypad. The items are selected by pressing the SELECT key or the down arrow key on the navigation/selection keypad.
## Front Panel LEDs

The functions of the LEDs are described in the table below.

<table>
<thead>
<tr>
<th>LED</th>
<th>Signal State/Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm</td>
<td>Red</td>
<td>Solid for five seconds indicates a Warning.</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>Flashing indicates an Alarm.</td>
</tr>
<tr>
<td>Signal</td>
<td>Green</td>
<td>Solid indicates all of the following conditions:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• active RF, ASI, and IP inputs are enabled, locked to a signal, and are not muted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• all outputs are operating without an error.</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Flashing indicates one of the following conditions:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• difficulty with an input, route, or output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• one or more of the inputs are not synchronized.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• one or more ASI outputs are routed, but muted by a fault condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• receiver is not authorized to receive the program.</td>
</tr>
<tr>
<td>Off</td>
<td>Off</td>
<td>Off indicates all of the following conditions:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no RF input signal is available, enabled or detected, or the input is muted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no ASI input present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no IP input present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no valid inputs are available.</td>
</tr>
</tbody>
</table>

## CI Slots

The CI slots allow the use of CAM (Conditional Access Module) Smart Card to decrypt purchased programming.

## Navigation/Selection Keypad

The navigation keys on the front panel (LEFT, RIGHT, UP, and DOWN) and the SELECT key are the primary controllers. Each navigation key performs various functions, depending on the current state of the menu system (that is, sometimes the left navigation key backspaces over an entry and sometimes moves the cursor to a different menu item). Once the cursor is over the desired function, pressing the SELECT (center key) key selects the current item. Pressing the SELECT key stores any entered values.

The table below describes the front panel keys.
<table>
<thead>
<tr>
<th>Front Panel Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left arrow</td>
<td>When moving through menus, it highlights the menu item to the left. When entering data, it moves the cursor to the left. In some menus, it backspaces over the data entry.</td>
</tr>
<tr>
<td>Right arrow</td>
<td>When moving through menus, it highlights the menu item to the right. When entering data, it moves the cursor to the right.</td>
</tr>
<tr>
<td>Up arrow</td>
<td>Highlights the menu item above.</td>
</tr>
<tr>
<td>Down arrow</td>
<td>Highlights the menu item below.</td>
</tr>
<tr>
<td>SELECT</td>
<td>Runs the highlighted command or opens the highlighted menu.</td>
</tr>
<tr>
<td>INFO</td>
<td>Displays context-sensitive help messages, when available. When entering characters in numeric or alphanumeric fields, this key is used to toggle between uppercase and lowercase.</td>
</tr>
<tr>
<td>MENU</td>
<td>Starts the on-screen display, and it also functions as an Escape key, allowing you to back out of menus and data entry fields.</td>
</tr>
<tr>
<td>ADV</td>
<td>Toggles between program entry and channel number.</td>
</tr>
<tr>
<td>MAP</td>
<td>Allows you to edit, insert, and delete the Digital Program Mapping (DPM) modes on program entries or PIDs within program entries.</td>
</tr>
<tr>
<td>APPLY</td>
<td>Saves and applies the setting changes to the receiver.</td>
</tr>
<tr>
<td>NAV</td>
<td>For future use.</td>
</tr>
</tbody>
</table>

### Numeric Keypad

The numeric keypad is used to enter alphanumeric values. The MENU key sets the software to the initial menu and returns to the previous menu. The MENU key can also be used to cancel a numeric entry at any point during the entry sequence, and the left arrow key allows backspacing through the entry.

Pressing the numeric keys 2 to 9 once will enter the respective digit into a data entry field. Pressing these buttons again will enter the first of the letters displayed beside the number. Repeatedly pressing the button will toggle through all of the possible choices.

When entering text, press the 1 key twice to insert a space.

To delete a character, press 0 twice.

### Locking or Unlocking the Front Panel

Depending on the default settings, the receiver is shipped with a locked or unlocked front panel. You can lock or unlock the front panel using the front panel keypad or the web GUI.

#### Step 1

From the D9800 web GUI, choose **System Settings > Front Panel**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Admin > KB Lock**.
**Step 2**
Check the **Enable Automatic Front Panel Keyboard Lock** check box or choose the **Enable** front panel menu to lock the front panel. To permanently unlock the front panel, change the KB Lock state to **Disabled** or uncheck the check box.

**Step 3**
In the **Keyboard Lock Timeout** field, enter the keypad lock timeout period. The lock timeout period takes effect when the keypad has not been touched (for example, a key has not been pressed) when on the Main Menu for the set period. Avoid setting the period to a short duration when the keypad is used often. Enter a value in the range from 5 to 1800 seconds. The default is 60 seconds.

**Step 4**
Press **MENU** until the Startup screen is displayed.

**Step 5**
From the Startup screen, press **SELECT**, and then **INFO**.

**Note**
If the lock level is 3 or 4, you must enter a password to unlock the front panel.

---

**Startup Screen**

The Startup screen on the D9800 front panel displays basic signal and program information. The following is an example of the Startup screen:

*Figure 5: D9800 Startup Screen*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>Displays the program entry. The receiver supports up to 32 program entries.</td>
</tr>
<tr>
<td></td>
<td>Single-Stream unit: Only PE1 supports PowerVu descrambling. Do not assign PowerVu channels to PE2 to PE32. If any PowerVu channels are assigned to PE2 to PE32, all Service PIDs associated with these channels will be dropped from the transport output.</td>
</tr>
<tr>
<td></td>
<td>Multi-Stream unit: All 32 PEs support PowerVu descrambling. You may need the appropriate licenses to permit configuration of channels to the PEs.</td>
</tr>
<tr>
<td></td>
<td>All 32 program entries can use the Conditional Access Modules (CAMs).</td>
</tr>
<tr>
<td>12345</td>
<td>Displays the channel number for program monitoring.</td>
</tr>
<tr>
<td>Channel Name</td>
<td>Indicates the name of the monitored program.</td>
</tr>
<tr>
<td>RF</td>
<td>Displays the active RF input port. ASI or IP is shown if the ASI or IP port is active.</td>
</tr>
<tr>
<td>Freq</td>
<td>Displays the downlink frequency of the tuned signal, in GHz.</td>
</tr>
<tr>
<td>Lvl</td>
<td>Displays the signal level, in dBm.</td>
</tr>
<tr>
<td>Marg</td>
<td>Indicates the carrier-to-noise (C/N) margin, in dB.</td>
</tr>
</tbody>
</table>
The Degraded indicator only appears if there is degraded tuning information in use. This occurs if the SI tables are not consistent on the incoming stream. The receiver will attempt to identify the service list based on the information available. Check the SI acquisition and stream information to ensure that the channels, network, and tuning information are operating as expected.

### Viewing the Channel Authorization Status

From the Startup screen of the D9800 front panel, press the right or left arrow keys on the keypad to move to the PE entry authorization status screen. This screen displays all the available channels and whether the channels are authorized (Y or N).

### LCD Symbol

Various symbols will periodically appear in the top right-hand corner of the LCD panel, indicating which user actions are currently acceptable. The following displays an example of the location of the symbol:

Symbol

![Symbol Example](image)

The table below describes the symbols.

<table>
<thead>
<tr>
<th>LCD Symbol</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![Symbol](image) | Indicates that parameters are being saved in the background. You can continue to perform any operation desired.  
**Note** If a power-cycle/interruption occurs while the hourglass is displayed, some parameters may not be saved. Refrain from powering off the unit while the hourglass is displayed. |
| ![Symbol](image) | Indicates that the INFO key is active. In most cases, this will display contextual information on the LCD screen. |
| ![Symbol](image) | Indicates that the SELECT key is active. |
| ![Symbol](image) | The Download In Progress (DL) symbol indicates that the receiver is currently downloading a software update and storing it into memory in the background.  
**Note** Service interruption occurs during a reboot, which is always required during a software update. |
### Adjusting the LCD Contrast

<table>
<thead>
<tr>
<th>LCD Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Description" /></td>
<td>The Download Trigger (DT) symbol indicates that a new software is ready for download, but a download trigger by the receiver is required before it is downloaded. <strong>Note</strong> Service interruption occurs during a reboot, which is always required during a software update.</td>
</tr>
<tr>
<td><img src="image2" alt="Description" /></td>
<td>The Download symbol indicates that a software download for a version of software already in memory has been detected.</td>
</tr>
<tr>
<td><img src="image3" alt="Description" /></td>
<td>The Disaster Recovery (DR) symbol indicates that a disaster is declared on the current receiver.</td>
</tr>
<tr>
<td><img src="image4" alt="Description" /></td>
<td>The NIT Retune (NR) symbol indicates that a NIT retune recovery is in progress on the current receiver.</td>
</tr>
<tr>
<td><img src="image5" alt="Description" /></td>
<td>The Session Open symbol indicates that you are changing a group of related items.</td>
</tr>
</tbody>
</table>

**Adjusting the LCD Contrast**

**Step 1** From the Main Menu of the D9800 front panel, choose **Setup > Admin > LCD Contrast**.

**Step 2** Choose the contrast of the LCD menu panel. The range is from 1 (lowest contrast) to 30 (highest contrast).

**Step 3** Save the settings.

---

### Logging on to the D9800 Web GUI

**Step 1** Open a web browser.

**Step 2** Type the IP address of the D9800 Network Transport Receiver in the address bar and press Enter. You can view and configure the IP address in the following front panel menu: **Setup > IP > IP > IP Address**.

**Step 3** By default, the remote access is set up for a secure HTTPS connection. An untrusted warning message is displayed for you to add the current address as an exception. You must add the current IP address as an exception to access the web GUI. For more information on the HTTP setting, see **Configuring the Remote Access Protocols, on page 136**.

**Step 4** In the **Username** and **Password** fields, enter the username and password. The default username is **admin**, and the default password is **localadmin**.

**Step 5** Click **Log In**.
If you check the **Remember username** check box, the user name will be remembered the next time you log into the web GUI.

---

### Changing the Login Password

Each user, including the admin user, can only modify their own password. The password complexity feature is only available to users with administrative privileges. For more information, see Changing the Password Complexity, on page 28.

<table>
<thead>
<tr>
<th>Step 1</th>
<th>From the D9800 web GUI, choose <strong>System Settings &gt; Account Management</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>In the <strong>Enter Current Password</strong> field, type the current login password.</td>
</tr>
<tr>
<td>Step 3</td>
<td>In the <strong>Enter New Password</strong> field, type the new login password.</td>
</tr>
<tr>
<td>Step 4</td>
<td>In the <strong>Re-enter New Password</strong> field, type the new login password again to confirm. Once the password change is successful, the user will be directed to the login screen to re-enter their username and password.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click <strong>Apply</strong>.</td>
</tr>
</tbody>
</table>

---

### D9800 Web GUI Environment

The following is an example of the D9800 web GUI page:
The following table displays the general buttons on the D9800 web GUI.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply</td>
<td>Saves and applies the settings to the receiver.</td>
</tr>
<tr>
<td>Refresh</td>
<td>Reads existing data from the unit. If edits were made in a setup page, then unsaved changes are discarded.</td>
</tr>
<tr>
<td>Reset Defaults</td>
<td>Discards any changes made and sets data to default values.</td>
</tr>
<tr>
<td>Clear Counters</td>
<td>Resets counters on the displayed page.</td>
</tr>
</tbody>
</table>

Alarms/Warnings

The top right corner of the D9800 web GUI displays the total number of active alarms (],& active warnings (%), and clear messages (✓). Clear messages is calculated as follows: total number of alarms + total number of warnings - total number of active alarms - total number of active warnings.
To view a detailed list of alarms and warnings, click the Alarms or Warnings link and a pop-up window is displayed with a list of all the active alarms or active warnings. Click an alarm or warning to open the Status page for more information.

**Viewing the Summary Overview**

The Summary Dashboard page displays the main settings of the D9800 Network Transport Receiver. To view the Summary Dashboard page, choose Summary from the D9800 web GUI.

You can customize the Summary Dashboard by clicking Add/Remove Module or by clicking x at the top right corner of each module. Each module has a maximize and minimize button, allowing you to view or hide various modules. The refresh button for each module allows you to refresh the data for the selected module only.

The table below describes the available modules.

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decoded Program Status</td>
<td>Displays channel and service information.</td>
</tr>
<tr>
<td>Current Input Status</td>
<td>Displays the current RF Tuning Status information, including the downlink frequency and signal status.</td>
</tr>
<tr>
<td>Tuner Performance</td>
<td>Displays the satellite dish status, such as the C/N Margin and Signal Level.</td>
</tr>
<tr>
<td>Video Status</td>
<td>Displays the current video information.</td>
</tr>
<tr>
<td>Channel Status</td>
<td>Displays the channel status information, such as the type of CA used and whether the receiver is authorized to receive the signal.</td>
</tr>
<tr>
<td>PID Information</td>
<td>Displays the PIDs associated with the channels.</td>
</tr>
<tr>
<td>CI Status</td>
<td>Displays the CAM card information.</td>
</tr>
<tr>
<td>Most Recent Alarm/Warning</td>
<td>Displays the currently active alarms and warnings.</td>
</tr>
<tr>
<td>FEC Decoder Status</td>
<td>Displays the Forward Error Correction (FEC) status, such as number of FEC columns and overhead percentage.</td>
</tr>
</tbody>
</table>

**Auto-Refresh**

The system automatically refreshes the Summary Dashboard page every minute. Click Auto Refresh: On/Off to toggle between enabling or disabling the automatic refresh feature.

**Basic Vs. Advanced Mode**

All the D9800 features are available in the Advanced mode (default). However, you have the option of limiting the features available by switching to the Basic mode. The mode option is available at the top right-hand corner of the D9800 web GUI.
Quick Setup

The following table provides the most common tasks to initially configure the D9800 Network Transport Receiver.

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting up the Network Connection, on page 27</td>
<td>Set up the network connection.</td>
</tr>
<tr>
<td>Tuning to an RF Input, on page 39, Tuning to the ASI Input, on page 46, Tuning to the MPEGoIP Input, on page 48, or Tuning to the ABR Input, on page 56</td>
<td>Acquire and configure one of the following inputs: RF, ASI, IP, or ABR.</td>
</tr>
<tr>
<td>Assigning a Channel to a Program Entry, on page 74</td>
<td>Assign a program channel to a program entry.</td>
</tr>
<tr>
<td>Configuring the ASI or MPEGoIP Output General Settings, on page 109 and Configuring the ASI or MPEGoIP Output Mode, on page 110</td>
<td>Set the following ASI output parameters:</td>
</tr>
<tr>
<td></td>
<td>• Output Mode - We recommend to set it to MAP Service Channels Only. Select Yes if requested to Resync All.</td>
</tr>
<tr>
<td></td>
<td>• Descramble Mode</td>
</tr>
<tr>
<td></td>
<td>• Insert Null Packet - Set to Yes.</td>
</tr>
</tbody>
</table>
### Task and Description

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuring the SDI Outputs, on page 93</td>
<td>Choose the SDI1 and SDI2 outputs. The SDI outputs are only available on units with the SDI option installed (D9800-3G-SDI).</td>
</tr>
<tr>
<td>Configuring the ASI or MPEGoIP Output General Settings, on page 109 and Configuring MPEG over IP or IP Data Streams, on page 128</td>
<td>Configure the MPEG over IP output and stream settings. The MPEGoIP outputs are only available on units with the MPEGoIP input/output option installed (D9800-SS-MPEGoIP). For multi-stream units (D9800-MS-MPEGoIP), configure the IP data output and stream settings.</td>
</tr>
<tr>
<td>Typical Digital Program Mapping Setup, on page 120</td>
<td>Set the DPM mode.</td>
</tr>
</tbody>
</table>
Administrative Settings

This section describes administrative settings, such as configuring lock levels and exporting settings files.

- Setting up the Network Connection, on page 27
- Managing the Web GUI Accounts, on page 28
- Resetting the Login Credentials, on page 29
- Configuring Lock Level Settings, on page 30
- D9800 Receiver Factory Reset, on page 31
- Rebooting the D9800 Receiver, on page 31
- Importing/Exporting D9800 Settings File, on page 32
- Viewing the D9800 Usage Information, on page 32
- Viewing Operating Board Temperatures, on page 33
- Viewing the D9800 System Information, on page 34
- Viewing Hardware Features and Software License Information, on page 34
- Downloading a Software License, on page 34
- Rehosting Software Licenses, on page 35
- Configuring the Time/Clock Settings, on page 36
- Viewing the System Version Information, on page 37
- Viewing the D9800 Hardware Version Information, on page 37
- Viewing Diagnostic Logs, on page 37
- Exporting Debug Support Data, on page 38
- SSH Access for D9800 Support, on page 38

Setting up the Network Connection

**Step 1**  From the Main Menu of the D9800 front panel, choose Setup > IP > IP.

**Step 2**  Choose IP Address, Mask, and Gateway menus and use the number keys to enter the IP network information.

**Step 3**  Press APPLY.
Managing the Web GUI Accounts

You can define up to 10 usernames/passwords for login use via the web GUI. When a user tries to log in, the user is required to provide a username and a password. The user is granted access only if this username/password pair exists in the authentication table.

The factory preset "admin" account has Admin privileges and is allowed to add new users, delete users, change usernames, and modify its own passwords. Users with non-Admin privileges (for example, User and Guest) are only allowed to modify their own passwords.

Changing the Password Complexity

Step 1  Ensure that you are logged in to the D9800 web GUI with admin privileges.
Step 2  Choose System Settings > Account Management.
Step 3  From the Password Complexity drop-down list, choose the complexity of the user password. Any changes take effect immediately, and do not require the use of the Apply button. The table below describes the rules for each level.

<table>
<thead>
<tr>
<th>Password</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Checking</td>
<td>There are no restrictions on passwords. A minimum of one character is required.</td>
</tr>
<tr>
<td>Minimal Checking</td>
<td>A password must comply with the following requirements:</td>
</tr>
<tr>
<td></td>
<td>• It cannot contain username or reversed username.</td>
</tr>
<tr>
<td></td>
<td>• It cannot contain any of the following strings: cisco, sciatl, ocsic, Itaics, atlscl, icslta, or any string achieved by full or partial capitalization of letters.</td>
</tr>
<tr>
<td></td>
<td>• No letter is repeated more than three times in a row.</td>
</tr>
<tr>
<td></td>
<td>• Must contain a minimum of four characters.</td>
</tr>
<tr>
<td>Full Complexity Checking</td>
<td>A password must comply with the following requirements:</td>
</tr>
<tr>
<td></td>
<td>• It cannot contain username or reversed username.</td>
</tr>
<tr>
<td></td>
<td>• It cannot contain any of the following strings: cisco, sciatl, ocsic, Itaics, atlscl, icslta, or any string achieved by full or partial capitalization of letters.</td>
</tr>
<tr>
<td></td>
<td>• No letter is repeated more than three times in a row.</td>
</tr>
<tr>
<td></td>
<td>• Must contain a minimum of eight characters.</td>
</tr>
<tr>
<td></td>
<td>• Must contain a minimum of three of the following types of characters:</td>
</tr>
<tr>
<td></td>
<td>capital letters, small letters, digits, and special characters.</td>
</tr>
</tbody>
</table>
The complexity level changes will only affect the new user accounts and password changes. It will not affect existing passwords.

### Adding a New User Account

**Step 1** Ensure that you are logged in to the D9800 web GUI with admin privileges.

**Step 2** Choose System Settings > Account Management, and click the Manage User Logins link.

**Step 3** Click Add Account Login.

**Step 4** In the Username field, enter a user ID. The new username should not match any of the usernames already defined in the Logins Account area.

**Step 5** In the New Password field, enter a password to assign the user ID. The password must follow the rules configured in the Password Complexity parameter. For more information, see Changing the Password Complexity, on page 28.

**Step 6** Enter the new password again to confirm in the Confirm New Password field. The New Password and Confirm New Password should be identical.

**Step 7** In the Administrator Password field, enter your Administrator password used to log in to the web GUI.

**Step 8** From the Account Type drop-down list, choose a login types:

- Guest - View settings only.
- User - View and edit settings.
- Admin - View, edit settings, and add/delete user accounts.

**Step 9** Click OK.

### Deleting a User Account

**Step 1** Ensure that you are logged in to the D9800 web GUI with admin privileges.

**Step 2** Choose System Settings > Account Management, and click the Manage User Logins link.

**Step 3** In the Login Accounts area, click the radio button of the user account you want to remove and click Delete Account Login.

**Step 4** In the Administrator Password field, enter the Administrator password and click OK.

### Resetting the Login Credentials

If you cannot access the unit, due to a forgotten password or corrupted data, the user authentication table can be reset from the front panel. If configured, you can also remove all setting files and reset the unit back to its factory default settings.
Step 1
Ensure that the appropriate credentials reset setting is configured on the D9800 web GUI:

a) Log in to the D9800 web GUI with admin privileges.
b) From the D9800 web GUI, choose System Settings > Account Management.
c) In the Credentials Reset area, choose one of the following:
   - Random Password - When you reset the credentials on the front panel, a random admin password is generated.
   - Clean Slate - When you reset the credentials on the front panel, all the settings are removed, and the unit is reset back to its factory default values.
d) Click Apply.

Step 2
From the Main Menu of the D9800 front panel, choose Setup > IP > IP.

Step 3
Scroll down to Reset Credentials and press SELECT. Depending on the Credentials Reset setting configured in Step 1, one of the two messages are displayed:

- OK to remove users & reset admin - If confirmed, all existing user accounts will be lost, and a randomly generated password will be displayed on the front panel for approximately 30 seconds. The new password is for the admin login account. We recommend that you change the password. For more information on changing the password, refer to Changing the Login Password, on page 21.
- OK to clear all settings & reboot - If confirmed, all setting files are removed, and the unit will return back to its factory settings.

Step 4
Press right and then press SELECT to confirm the operation.

Configuring Lock Level Settings

The lock level settings allow you to protect the receiver and its settings against unauthorized use or modification. The unit is factory configured with default settings, unless a custom factory configuration was requested.

The table below lists the lock levels.

<table>
<thead>
<tr>
<th>Lock Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>All settings are unlocked (receiver lockout disabled).</td>
</tr>
<tr>
<td>1</td>
<td>All settings are unlocked except Factory Reset, Password options and receiver parameters.</td>
</tr>
<tr>
<td>2</td>
<td>All settings are unlocked except RF and ASI Input Tuning parameters.</td>
</tr>
<tr>
<td>3</td>
<td>All settings are locked (access via password only), except IP address and RF power.</td>
</tr>
<tr>
<td>4</td>
<td>All settings are locked. It can be changed via Cisco PowerVu Network Center (PNC) uplink signal only.</td>
</tr>
</tbody>
</table>

Step 1
From the D9800 web GUI, choose System Settings > Lock Level Settings and click Change Lock Level. Or, from the Main Menu of the D9800 front panel, choose Setup > Admin.
Step 2 From the **Lock Level** drop-down list or front panel menu, choose the lock level that restricts access and prevents unauthorized changes to the receiver settings (0, 1, 2, 3, or 4). The table above describes each level. The default setting is 0.

Step 3 In the **Enter Password to change the Lock Level** field, or use the right arrow key to select the **Password** menu, enter the password to change the lock level. For details on the default password, contact Cisco Services.

Step 4 Click **OK** or press **MENU** until it prompts you to save your changes.

---

**Changing the Lock Level Password**

A unique lock level password (4-digit password) protects the current receiver settings against unauthorized changes. When changing the password, record and keep this number in a secure location. To change the password, the lock level of the unit must be set to 0.

⚠️ **Caution**

Proceed with caution when changing the password as this operation cannot be undone. If the password is lost or is unavailable, contact Cisco Services.

---

**D9800 Receiver Factory Reset**

You can reset the D9800 receiver settings back to its factory default values.

Step 1 From the D9800 web GUI, choose **System Settings** > **Lock Level Settings** and click **Change Lock Level Password**. Or, from the Main Menu of the D9800 front panel, choose **Setup** > **Admin**.

Step 2 In the **Enter Current Password** field or the **Old Pwd** front panel menu, enter the current password.

Step 3 In the **Enter New Password** field or the **New Pwd** front panel menu, enter the new password.

Step 4 In the **Re-enter New Password** field or the **Confirm Pwd** front panel menu, enter the new password again.

Step 5 Click **OK** or press **MENU** until it prompts you to save your changes.

---

**Rebooting the D9800 Receiver**

Step 1 From the Main Menu of the D9800 front panel, choose **Setup** > **Admin**.
Importing/Exporting D9800 Settings File

The settings file serves as backup, in the event that the device/user settings are required to restore the receiver. We recommend that you export the device settings to a file prior to upgrading the D9800 receiver.

Exporting the D9800 Settings File

**Step 1**  From the D9800 web GUI, choose **System Settings > Settings File**.

**Step 2**  In the **Device Settings File Transfer** area, click the **Export Device Settings & Transport Network Information** radio button to download device settings and transport network information as a file to the designated file folder, or click the **Export User Device Settings Only** radio button to download user settings as a file to the designated file folder.

**Step 3**  Click **Export**.

**Step 4**  Save the settings file to a local folder. The **Settings File Backup History** area displays the name, date, and time of the last file that was successfully exported.

**Note**  The backup file name displayed is the default file name (backup_extended.xml), not the file name given by you when you saved the file.

Importing the D9800 Settings File

**Step 1**  From the D9800 web GUI, choose **System Settings > Settings File**.

**Step 2**  In the **Settings File** area, click **Browse** and choose the settings file you want to import.

**Step 3**  Click **Open**.

**Step 4**  Click **Import**. The **Settings File Restore History** area displays the name, date, and time of the last file that was successfully imported.

**Note**  The restore file name displayed is the default file name (backup_extended.xml), not the file name you selected when restoring.

Viewing the D9800 Usage Information

The Usage Counters page (**Support > Usage Counters**) and the Power On front panel menu (**Main Menu > Diagnostics**) displays the usage counter information on the D9800 unit, for example, the power on date and time, and the hours since the last reset.
The table below describes the usage counter information.

<table>
<thead>
<tr>
<th>Web GUI Parameter</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Date &amp; Time</td>
<td>Creation Date and Time</td>
<td>Displays the date and time when the receiver was manufactured.</td>
</tr>
<tr>
<td>Last Power On Date and Time</td>
<td>Power On Date and Time</td>
<td>Displays the date and time when the receiver was powered up.</td>
</tr>
<tr>
<td>Lifetime Hours Powered</td>
<td>Total Hrs</td>
<td>Displays the number of hours the current unit has been running since it was manufactured.</td>
</tr>
<tr>
<td>Lifetime Reset Counter</td>
<td>Tot Rst #</td>
<td>Displays the total number of times the receiver has been restarted since it was manufactured.</td>
</tr>
<tr>
<td>Clearable Reset Counter</td>
<td>Clrbl Rst #</td>
<td>Displays the number of restarts since the last time the restart counter was cleared. To clear or reset the Clearable Reset Count, click <strong>Clear Reset Counter</strong>, or select the <strong>Clr Rst #</strong> front panel menu to clear or reset the Clrbl Rst # to 0.</td>
</tr>
<tr>
<td>Hours Since Last Powered-On/Reset</td>
<td>Hrs Since Last Pwroff</td>
<td>Displays the total number of hours that the receiver has been operating since the last power-on or restart.</td>
</tr>
<tr>
<td>Last Reset Reason</td>
<td>Reason For Last Reset</td>
<td>Displays the reason for the last restart, for example, power cycle or manual reset.</td>
</tr>
</tbody>
</table>

Viewing Operating Board Temperatures

The System Temperatures page of the D9800 web GUI (**Support > System Temperatures**) and the Health Monitor front panel menu (**Main Menu > Diagnostics > Health Monitor**) displays the operating temperatures of the D9800 boards and fans.

The **System Overview** area displays the temperatures measured at the intake, with the lowest temperature measurement. The **System Intake** is the current temperature, the **Ambient Peak Temp** is the highest historical reading of that temperature, and the **Ambient Temp Average** is the historical average temperature. Click **Temperature Details** to display all the measured temperatures for all the temperature sensors in the system.

The **Fan Status** area displays the current speed of the three fans in the D9800 receiver.

The **Power Status** area displays whether the supply voltages for each board are between the allowed minimum and maximum. Click **Power Details** to display the voltage readings from all the sensors in the system.
Viewing the D9800 System Information

From the D9800 web GUI, choose System Settings > Identification. Or, from the Main Menu of the D9800 front panel, choose About > General.

The Identification page displays the parameters associated with the D9800 receiver, such as serial number, model number, and user addresses. The Hostname field or front panel menu allows you to set a name for the device.

Viewing Hardware Features and Software License Information

From the D9800 web GUI, choose System Settings > Features/Licenses. Or, from the Main Menu of the D9800 front panel, choose About > Features or Licenses.

The Hardware Features area, or the Features front panel menu, displays the hardware options installed on the current D9800 Network Transport Receiver. For example, it indicates whether the receiver is equipped with an SDI output. The Multi-Stream displays whether the current unit is a multi-stream unit (Yes), or a single-stream unit (No). The Transcoder Available field indicates the number of transcoders installed on the current multi-stream unit (8 transcoders per transcoder board installed, with a maximum of 2 transcoder boards per unit). The HEVC Processing field indicates the number of transcoders that can process and transcode the HEVC input, on the current multi-stream unit (6 transcoders per HEVC processor board, with a maximum of 2 HEVC processor boards per unit).

The Feature License Summary area, or the Licenses front panel menu, displays a list of software licenses (such as ABR and Zixi input licenses) and whether the licenses are enabled or disabled on the D9800 receiver, and installed licenses with license count (if applicable).

For a multi-stream unit, the HD Transcode License Count field or front panel menu displays the number of program entries that can perform both SD and HD transcode. The SD Transcode License Count field or front panel menu displays the number of program entries that can perform SD transcode only. For example, a fully licensed multi-stream unit, with additional 6 SD and 7 HD upgrades, is displayed as 8 for the HD Transcode License Count feature and 0 for the SD Transcode License Count feature. The HEVC Transcode License Count field or front panel menu indicates the number of program entries that can transcode HEVC input. The IPI TS License field or front panel menu indicates the maximum number of inputs allowed.

The APP/License Downloads area allows you to download and install the D9800 software or license file. For more information, see Downloading and Installing the D9800 Software, on page 12 or Downloading a Software License, on page 34.

The License Re-hosting Certificate area allows you to transfer licenses between D9800 units. For more information, see Rehosting Software Licenses, on page 35.

Downloading a Software License

If the unit is new from the factory, without any licenses loaded, it is recommended that you wait three minutes after you first boot up the unit before downloading a license file. If the unit has previously loaded licenses, we recommend that you wait ten minutes after you boot up the unit before downloading a new license file.

Step 1

From the D9800 web GUI, choose Support > Service Actions.
Rehosting Software Licenses

If required, you can transfer licenses between D9800 units. The License Rehost feature removes unused licenses from one unit, and you can use those licenses on another unit of your choice. For example, if the licenses are fulfilled for the wrong unit, or you have a surplus of licenses, you can uninstall the licenses from one unit and rehost them on another unit.

The available licenses, including the installed license counts, are listed in the Feature License Summary area (System Settings > Features/Licenses). For more information, see Viewing Hardware Features and Software License Information, on page 34.

Step 1
Ensure that the current unit has the certificate and valid signature symbols displayed (System Settings > Identification). For more information, see Viewing the Hardware Information, on page 10.

Step 2
From the unit you want to remove the licenses, export the license rehost certificate.

a) From the D9800 web GUI, choose System Settings > Features/Licenses.

b) In the License Re-host Certificate area, click Export.

c) Save the file.

Step 3
In the Cisco Product Registration Portal (https://slexui.cloudapps.cisco.com/SWIFT/LicensingUI/Home), upload the saved certificate file. Ensure that the user address of the device selected matches the user address of the unit you want to remove the licenses. For details, refer to the licensing help provided. The Swift team will provide a rehost CDT file.

Step 4
Download and install the CDT file, provided by the Swift team, to the unit you want to remove the licenses. For details on installing the D9800 software, see Downloading and Installing the D9800 Software, on page 12. Once the installation is successfully completed, the license count is updated in the Feature License Summary area (licenses you selected to rehost is decreased), and a unique verification code is displayed in the Download Verification field. The following is an example of the license count updated, and the verification code displayed:
Step 5 In the Cisco Product License Registration Portal (https://slexui.cloudapps.cisco.com/SWIFT/LicensingUI/Home), provide the verification code to complete the secure rehost. For details, refer to the licensing help provided. For a history of the verification codes, click License Rehost History. The table displays the date and time of the rehost, as well as the unique verification codes in the Message column.

Step 6 Generate a new license file in the Product License Registration Portal, and install the new license file in the unit you want to rehost the licenses.

Configuring the Time/Clock Settings

Step 1 From the D9800 web GUI, choose System Settings > Time/Clock. Or, from the Main Menu of the D9800 front panel, choose Setup > Admin.

Step 2 From the Date Format drop-down list or front panel menu, choose the date format of the receiver. The following formats are supported: YYYY_MM_DD, DD_MM YYYY, MM_DD YYYY.

Step 3 From the Time Format drop-down list or front panel menu, choose the time format of the receiver. Current time information is normally broadcast as part of the transmitted digital signal. It is broadcast as GMT (Greenwich Mean Time) with date information in Modified Julian Date format. The following formats are supported: 24Hr, 24Hr SuspendZero (the leading zero is dropped from the time), 12Hr, 12Hr SuspendZero (the leading zero is dropped from the time).

Step 4 From the GMT Offset drop-down list or the GMT Off front panel menu, choose the GMT offset time. The local time is displayed using a time zone (GMT offset). If your local time is not GMT, you must set this time setting in the range from -12.0 to +12.0 hours in 0.5 hour increments.

Step 5 The Current TDT Time/Date field or front panel menu (Status > General) displays the current Time and Date Table (TDT) date and time received from the DVB stream. This is displayed as UTC (Coordinated Universal Time).

Step 6 Check the Enable NTP Time Service check box, or choose Yes in the NTP Enable front panel menu (Setup > IP > IP), to periodically request NTP (Network Time Protocol) timestamps from the NTP server (NTP server address set below) and to synchronize its system (for example, non-DVB related) time with the NTP server. This is displayed as local time.
Step 7  In the NTP Server Address field, or the NTP Server front panel menu (Setup > IP > IP), enter the IP address of the NTP server. If the NTP server address is not set (0.0.0.0), the unit will not attempt to connect to the server.

Step 8  The Current NTP Time/Date field, or Current NTP Date and Time front panel menu (Status > General) displays the current time of the unit when it receives a valid reply from the NTP server, adjusted for local time zone.

Step 9  Apply the changes.

---

Viewing the System Version Information

From the D9800 web GUI, choose System Settings > System (under Versions). Or, from the Main Menu of the D9800 front panel, choose Versions and scroll through to view the system versions.

The Current Versions area displays the application version number of the main controller board (NTC).

The Version Controls area allows you to choose a different application version number to load. Or, select the Application front panel menu and scroll through and select the version number to load. The Selected Version dialog box is displayed. Click Select & Reboot, or choose the Select front panel menu, to load the selected application and reboot the unit. Click Erase, or choose the Erase front panel menu, to remove the selected application version.

The System - Firmware Versions area displays the FPGA and Eeprom versions of the system boards.

The HW Board Versions area displays the revisions, option bits, and serial numbers of the system and decoder boards.

The APP/License Downloads area allows you to download and install the D9800 software or license file. For more information, see Downloading and Installing the D9800 Software, on page 12 or Downloading a Software License, on page 34.

Viewing the D9800 Hardware Version Information

From the D9800 web GUI, choose System Settings > Decoder, Transcoder, or HEVC Processor (under Versions). Or, from the Main Menu of the D9800 front panel, choose Versions and scroll through to view the hardware versions.

The Decoder, Transcoder, or HEVC Processor - Current Versions area displays the version number of the decoder board (NDM), the transcoder board(s) (NTM), or the HEVC processor board(s) (NTB).

The Decoder, Transcoder, or HEVC Processor - Firmware Versions area displays the FPGA, boot, BOLT, and Eeprom version numbers of the decoder board, the FPGA, and Eeprom version numbers of the transcoder board(s), or the FPGA, Eeprom, boot, and BOLT version numbers of the HEVC processor board(s).

The HW Board Versions area displays the revisions, option bits, and serial numbers of the system and decoder board, transcoder board(s), or HEVC processor board(s).

Viewing Diagnostic Logs

From the D9800 web GUI, choose Support > Diagnostic Logs.
The Diagnostic Logs page displays all the system log messages with their dates and times. Click the arrow next to Set Date and Time column to sort by date and time.

Click Clear to clear the log history.

Exporting Debug Support Data

Note The Collect Debug Support Data Export is used by Cisco Services only. We recommend that you collect the debug support data prior to contacting Cisco Services for any D9800 issues.

Step 1 From the D9800 web GUI, choose Support > Service Actions.
Step 2 Click Export. The progress bar displays the file export progress. If a failure occurs, the Operation Status and Detailed Status fields display the status and reason.
Step 3 Once the diagnostics file is created, a popup window is displayed, allowing you to open or save the diagnostics file. Choose Open or Save File and click OK.

Note The popup window is only displayed if the option is enabled on your browser.

SSH Access for D9800 Support

The D9800 receiver supports remote debugging at the customer site by authorized Cisco engineers. Upon a request from the customer, a connection to the unit is made available, directly or via remote desktop (for example TeamViewer, WebEx, or VNC), to the authorized Cisco engineer by the customer. The Cisco engineer will log into the unit, with an account provided by the customer. Upon successful login, the engineer is able to request a random cryptographic challenge from the unit that can only be decrypted on an access-controlled server inside Cisco. With the decrypted challenge, the engineer can open an SSH session to the unit and log in to the debug shell. The SSH daemon will automatically shut down upon completion of the debugging session.
CHAPTER 5

Configuring the Input Information

This section describes how to configure the RF input, ASI input, and the tuning information for the D9800 Network Transport Receiver.

- Setting up the RF Input, on page 39
- Tuning to the ASI Input, on page 46
- MPEG2IP Input, on page 48
- Tuning to the ABR Input, on page 56
- Tuning to the Zixi Input, on page 58
- Viewing the Current Input Status, on page 62
- Setting Up the Tuning Information, on page 63
- Disaster Recovery, on page 66
- Setting Up Muting Thresholds Controls, on page 72
- Assigning a Channel to a Program Entry, on page 74
- Viewing Incoming Stream Details, on page 78
- Configuring the Common Interface (CI) Information, on page 81
- Setting up the BISS Mode, on page 83
- Viewing the Conditional Access Status, on page 84

Setting up the RF Input

This section describes how to tune to an RF signal and set its parameters.

Tuning to an RF Input

A single-stream unit allows you to tune to one RF, ASI, ABR, Zixi, or IP (if applicable) input, and a multi-stream unit allows you to tune to multiple RF, ASI, ABR, Zixi, and/or IP inputs.

Note

If the unit is in a disaster recovery or NIT retune recovery mode, an error message is displayed, informing you that any changes made to the page will interrupt the disaster recovery or NIT retune process. The error message appears when you load, refresh, or apply changes to the page. For more information on NIT retune, see NIT Retune Recovery, on page 69. For more information on disaster recovery, see Disaster Recovery, on page 66.
Step 1  Do one of the following:

- Web GUI: From the D9800 web GUI, choose Input > Input Setup > RF tab.
- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose Setup > TS Input > InputRF1, RF2, RF3, or RF4.
- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose Setup > TS Input > Input > RF.

Step 2  If you are activating an RF input on a single-stream unit, do the following:

- In the RF Input Selection area, check the Use RF Input check box to activate the RF input and click the Use RF1, Use RF2, Use RF3, or Use RF4 radio button below to choose the RF input to activate. Or, from the front panel, choose RFx Active menu and then choose Act to activate the selected RF input.

Note  Setting a new active input on a single-stream unit will deactivate the current active input. A multi-stream unit allows multiple active inputs.

If you are activating an RF input on a multi-stream unit, do the following:

- In the RF Input Selection area, check the Use RF 1, Use RF 2, Use RF 3, and/or Use RF 4 check boxes to choose the RF inputs to activate. Or, from the RF front panel menu, choose the RF input number to activate, and then choose Yes from the Active menu.

For more information on configuring the tuning parameters, see Configuring the RF Tuning Parameters, on page 40 and Setting the RF LNB Configuration, on page 42.

Step 3  Apply your changes, or press MENU three times on the front panel to acquire the network. The receiver will search for the signal and display "Acquisition Successful". It will find the first available channel on the network.

If the front LED is solid green, the unit has a signal lock. Proceed with assigning a program channel. For more information, see Assigning a Channel to a Program Entry, on page 74. If the front LED is flashing green, the unit is unauthorized. Please contact your service provider and provide the Tracking ID number for authorization. The Tracking ID can be found in the About > General front panel menu. Make note of the Tracking ID number.

---

**Configuring the RF Tuning Parameters**

Note  If the unit is in a disaster recovery or NIT retune recovery mode, an error message is displayed, informing you that any changes made to the page will interrupt the disaster recovery or NIT retune process. The error message appears when you load, refresh, or apply changes to the page. For more information on NIT retune, see NIT Retune Recovery, on page 69. For more information on disaster recovery, see Disaster Recovery, on page 66.

Step 1  Do one of the following:

- Web GUI: From the D9800 web GUI, choose Input > Input Setup > RF tab.
• Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose Setup > TS Input > Input > RF1, RF2, RF3, or RF4.

• Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose Setup > TS Input > Input > RF, and choose the RF input you want to configure from the RF front panel menu.

Step 2
In the **Downlink Frequency** field, or the **Freq** front panel menu, enter the current operating downlink frequency used by the receiver for tuning the received digital signal. You can enter a value in the range from 0.0 to 15.0 GHz.

Step 3
In the **Symbol Rate** field, or the **SymRate** front panel menu, enter the symbol rate. The symbol rate must match that of transmitted signal. You can enter a value in the range from 1.0 to 45.0 Ms/s for DVB-S, 1.0 to 30.0 for DVB-S2 if Pilot Present is set to Yes on the front panel, or 5.0 to 45.0 for DVB-S2 if Pilot Present is set to No on the front panel.

Step 4
From the **FEC** drop-down list, choose the Forward Error Correction inner code rate, or **Auto** to automatically detect and match the FEC rate. The FEC rate must match the FEC of the transmitted signal.

Step 5
From the **Modulation** drop-down list or front panel menu, choose the modulation type for the received signal (DVB-S or DVB-S2).

Step 6
From the **Roll Off** drop-down list or front panel menu, choose the roll off factor of the incoming signal (.20, .25, .35). Set the value to .20 or .35 when DVB-S modulation is used, and either of the three when DVB-S2 is used. Use a small number to reject or filter carriers close to the same frequency.

Step 7
From the **IQ** drop-down list, or the **InputIQ** front panel menu, choose the input signal spectrum inversion setting, which allows the operator to track and select inverted and non-inverted digital signals. This is normally used to automatically reject or filter out unwanted signals.

When set to **Auto**, signal is tracked and inverted for correct selection, as required. When set to **Opposite**, the signal is always inverted. Conversely, when set to **Normal**, the signal is not inverted.

Step 8
In the **AFC Limit** field or front panel menu, enter the maximum Automated Frequency Control (AFC), used to automatically maintain a tuning of RF signal to the desired frequency (0 to +/- 5 MHz). The default value is +/- 3 MHz, which is ideal for operation above 10 Ms/s. However, for low symbol rate operation, we recommend that you set the value to +/- 1 MHz or less.

**Note**   This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23.

Step 9
From the **Input Selection** drop-down list, choose one of the following:

- **UserCfg** - Locks to the RF input set by the user.
- **SW Map** - Uses the orbital position settings from each input and map it to those in the NIT.

From the front panel, choose **Setup > TS Input > Tune Mode > Select**.

**Note**   This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23.

Step 10
The **RF1 22KHz** is only applicable for dual band applications. From the **RF 1 22 KHz** drop-down list, or **22kHz** front panel menu, choose whether to transmit the 22 kHz tone Local Oscillator control signal of RF1. The selections are On, Off, or Auto. Choose Auto to use the crossover frequency to determine if the tone is transmitted.

Step 11
From the **RF1 Power** drop-down menu, or **LNB Power** front panel menu, choose the power output of RF1 to the external Low Noise Block (LNB). If RF1 Power is set to V-NIT or H-NIT, it will use vertical and horizontal polarity until it is automatically read from the NIT.

**Note**   Power will not be applied to the LNB when set to Off.

Step 12
Apply your changes.
Setting the RF LNB Configuration

If the unit is in a disaster recovery or NIT retune recovery mode, an error message is displayed, informing you that any changes made to the page will interrupt the disaster recovery or NIT retune process. The error message appears when you load, refresh, or apply changes to the page. For more information on NIT retune, see NIT Retune Recovery, on page 69. For more information on disaster recovery, see Disaster Recovery, on page 66.

---

Step 1
Do one of the following:

- **Web GUI:** From the D9800 web GUI, choose **Input > Input Setup > RF tab.**
- **Front Panel (single-stream unit):** From the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > RF1, RF2, RF3, or RF4**
- **Front Panel (multi-stream unit):** From the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > RF**, and choose the RF input you want to configure from the RF front panel menu.

Step 2
In the **LO1 (Ghz)** field or the front panel menu, set the lower local oscillator frequency, in GHz, of the LNB. If it is a single band oscillator, set its frequency, in GHz. You can enter a value in a range from 0.0 to 15.0 GHz. This value must be lower than the value for LO2.

Step 3
In the **LO2 (Ghz)** field or front panel menu, set the higher oscillator frequency, in GHz, of the LNB. If it is a single band oscillator, set this value to 0.0. You can enter a value in a range from 0.0 to 15.0 GHz. This value must be higher than the value for LO1. In single-band LNB applications, set this value to 0.0.

Step 4
In the **Crossover** field or front panel menu, enter the crossover frequency for RF1, RF2, RF3, and/or RF4. This is an internal threshold frequency used for selecting the LO1 or LO2 frequency, depending on the current downlink frequency settings. This option is only used in dual-band LNB applications. You can enter a value in a range from 0.0 to 15.0 GHz. In a single-band LNB applications, set this value to 0.0.

Step 5
From the **Polarisation** drop-down list, or the **Pol** front panel menu, choose the signal polarisation setting (Horizontal, Vertical, or Automatic). This setting is only applicable when the LNB Power is set to H-NIT or V-NIT. It marks the polarity of the signal connected to the current RF input.

**Note** This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23.

Step 6
In the **Orbital Posn** field, set the orbital position of the RF input, in degrees. This is the location in orbit of the satellite currently being used. The satellite position (in degrees) in combination with the direction (either E (East) or W (West)) denotes the satellite position the dish connected to the current RF Input should point. This is used when the satellite is not available in the look-up menu list.

For the front panel, choose **Satellite** to set the satellite you want to use to receive the signal from the list of available satellites. When you choose the satellite, the orbital position is displayed. This is important for automatic switching from one RF input to another in the event of loss of the signal, allowing the receiver to acquire an alternate signal. If the satellite is not listed, enter the known orbital position (**OrbPos**) of the satellite you want to use to receive the signal. For manual configuration, enter the location of the satellite using the numerical keypad. The receiver will not recognize the satellite name and identify it as Unknown.

**Note** The Validate Orbital Position feature is not supported in the current release.

**Note** This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23.
Step 7 From the East/West Flag drop-down list, or the E/W front panel menu, choose the satellite position the dish connected to the current RF Input should point.

Note This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23.

Step 8 Apply your changes.

---

Reacquiring the RF Input Network Information

There are two methods to reacquiring the network: web GUI and front panel. To reacquire the network using the web GUI, follow the procedure below to retune and reacquire the selected input only. If you are reacquiring the network using the front panel, it retunes and reacquires all the active inputs. To reacquire the network using the front panel, choose Setup > TS Input > Re-acquire from the Main Menu of the front panel. To view the acquisition status on the front panel, choose Status > TS Input > Input > Tune Mode from the Main Menu of the front panel.

---

Step 1 From the D9800 web GUI, choose Input > Input Setup > RF tab.
Step 2 Ensure that the input you want to reacquire is enabled as the active input. For more information, see Tuning to an RF Input, on page 39.
Step 3 On a single-stream unit, choose the RF input you want to reacquire the signal and click Reacquire RF. On a multi-stream unit, click Reacquire RF1, Reacquire RF2, Reacquire RF3, or Reacquire RF4, depending on the RF input you want to reacquire the signal.

The receiver will retune the selected input to the tuning parameters from user settings and reacquire the PSI/SI information. The current Acquisition State is displayed on the Active Inputs page. The status displays Full if the SI and PSI tables have all been found. Otherwise, it will display Degraded if there are missing tables or None if no SI or PSI tables have been found.

---

Viewing the RF Tuning Status

From the D9800 web GUI, choose Input > Input Setup > RF tab, and refer to the Tuner Performance area. On a multi-stream unit, the tuner performance status is displayed for RF 1, RF 2, RF 3, and RF 4 inputs. Or, from the Main Menu of the D9800 front panel, choose Status > TS Input > Input > RF.

Note The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.

The table below describes the current RF input status information displayed.

<table>
<thead>
<tr>
<th>Web GUI field</th>
<th>Front Panel menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active</td>
<td>Indicates whether the RF input is activated (Yes or No).</td>
</tr>
<tr>
<td>Web GUI field</td>
<td>Front Panel menu</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Frequency (GHz)</td>
<td>Dnlk Freq (GHz)</td>
<td>The current downlink frequency, in GHz.</td>
</tr>
<tr>
<td>L band Freq. (MHz)</td>
<td>L-Band</td>
<td>The current L-Band frequency, in MHz.</td>
</tr>
<tr>
<td>Symbol Rate (Msym)</td>
<td>SymRate</td>
<td>Symbol rate of the received signal, in Msymbols/second.</td>
</tr>
<tr>
<td>FEC Rate</td>
<td>FEC</td>
<td>The FEC (Forward Error Correction) rate of the received signal.</td>
</tr>
<tr>
<td>Roll Off</td>
<td>Rolloff</td>
<td>Displays the roll off factor of the incoming signal (.20, .25, or .35).</td>
</tr>
</tbody>
</table>
| Signal Status | RF Lock | Indicates whether the input signal is locked.  
  • Locked - Indicates the receiver is locked to a carrier with no valid content.  
  • Lock+Sig - Indicates the receiver is locked to a carrier with valid content.  
  • No Lock - Indicates the receiver is not locked to a carrier. |
| AFC (MHz) | AFC (MHz) | Indicates the current Automatic Frequency Control count, in MHz. |
| Orbital Validation Status | — | This is not supported in the current release.  
  **Note** This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23. |
| Orbital Validation Date | — | This is not supported in the current release.  
  **Note** This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23. |
<p>| Modulation Type | Modulation | Indicates the modulation type for the received signal (N/A, QPSK, 8PSK, DVB-S, DVB-S2 or 16QAM). |
| — | Pol | Indicates the signal polarization setting. This setting is only applicable when LNB Power is set to H-NIT or V-NIT. The selected setting must match the polarization of the transmitted signal (Horiz (Horizontal), Vert (Vertical) or Auto). |
| — | IQ Tuner | Indicates the IQ (Input Signal Inversion) for the received signal (Inv or NonInv). |</p>
<table>
<thead>
<tr>
<th>Web GUI field</th>
<th>Front Panel menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ</td>
<td>IQ Status</td>
<td>Indicates the input signal spectrum inversion setting (IQ), which allows the operator to track and select inverted and non-inverted digital signals (Auto, Opposite, or Normal).</td>
</tr>
<tr>
<td>Rolloff</td>
<td></td>
<td>Displays the rolloff factor of the incoming signal.</td>
</tr>
<tr>
<td>Pilots</td>
<td>Pilot Present</td>
<td>Indicates whether a Pilot is present for the received signal. The Pilot is set on the modulator for input signal synchronization purposes (Yes, No, or N/A).</td>
</tr>
<tr>
<td>C/N (dB)</td>
<td></td>
<td>Indicates the current Carrier-to-Noise ratio, in dB.</td>
</tr>
<tr>
<td>PACKET ER</td>
<td>PER</td>
<td>Indicates the current PER (Packet Error Rate) of the received signal (DVB-S2).</td>
</tr>
<tr>
<td>PV BER</td>
<td>PVBER</td>
<td>Indicates the PV (Post-Viterbi) BER for the received signal (DVB-S).</td>
</tr>
<tr>
<td>LDPC ER</td>
<td>LDPCBER</td>
<td>Indicates the LDPC (Low Density Parity Check) error rate for the received signal (DVB-S2).</td>
</tr>
<tr>
<td>UEC</td>
<td></td>
<td>Indicates the current Uncorrected Error Count for the received signal.</td>
</tr>
<tr>
<td>CEC</td>
<td></td>
<td>Indicates the current Corrected Error Count for the received signal (DVB-S).</td>
</tr>
<tr>
<td>Clear Counts</td>
<td></td>
<td>Select this option to clear the error counters.</td>
</tr>
<tr>
<td>RF1 (Power)</td>
<td></td>
<td>Displays the power output of RF1 to the external Low Noise Block (LNB).</td>
</tr>
<tr>
<td>LNB Status</td>
<td>LNB Stat</td>
<td>Indicates the current Low Noise Block (LNB) connection status (No Load, Over Loaded, Over Temperature, Short Circuit, Disabled, Normal, or N/A).</td>
</tr>
<tr>
<td>C/N Margin (dB)</td>
<td>C/N Margin (dB)</td>
<td>Indicates the current Carrier-to-Noise Margin for the received signal. The Carrier-to-Noise margin is the actual distance that C/N is from the noise threshold. Values can be displayed in the range of -32.0 to +30.0 dB.</td>
</tr>
<tr>
<td>Signal Level (dBm)</td>
<td>Level (dBm)</td>
<td>Indicates the signal level of the received signal, in dBm.</td>
</tr>
<tr>
<td>Polar</td>
<td></td>
<td>Indicates the polarity of the LNB Power supply (Off, 13V, or 18V).</td>
</tr>
</tbody>
</table>
Tuning to the ASI Input

A single-stream unit allows you to tune to one RF, ASI, ABR, or IP (if applicable) input, and a multi-stream unit allows you to tune to multiple RF, ASI, ABR, and/or IP inputs.

<table>
<thead>
<tr>
<th>Web GUI field</th>
<th>Front Panel menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>LO Select</td>
<td>Indicates whether a 22 kHz tone is available on input port RF1. This is applicable for dual-band applications (On or Off).</td>
</tr>
</tbody>
</table>

**Step 1**
From the D9800 web GUI, choose **Input > Input Setup > ASI** tab. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > ASI**.

**Step 2**
If you are activating the ASI input on a single-stream unit, check the **Use ASI 1 Input** check box to tune to the ASI 1 input. Or, choose **ASI Active > Act** from the front panel.

**Note**
Setting a new active input on a single-stream unit will deactivate the current active input. A multi-stream unit allows multiple active inputs.

A multi-stream unit has two ASI input/output ports. If you are activating the ASI input(s) on a multi-stream unit, check the **Use ASI 1** and/or **Use ASI 2** check box. Or, choose the 1 or 2 from the **ASI** front panel menu, and then choose Yes from the **Active** menu.

**Step 3**
The **Configured As** front panel menu indicates whether the current ASI port is configured as an input port, output port, or none.

**Step 4**
Apply your changes.

Reacquiring the ASI Input Network Information

There are two methods to reacquiring the network: web GUI and front panel. To reacquire the network using the web GUI, follow the procedure below to retune and reacquire the selected input only. If you are reacquiring the network using the front panel, it retunes and reacquires all the active inputs (or the active input for a single-stream unit). To reacquire the network using the front panel, choose **Setup > TS Input > Re-acquire** from the Main Menu of the front panel. To view the acquisition status on the front panel, choose **Status > TS Input > Input > Tune Mode** from the Main Menu of the front panel.

**Step 1**
From the D9800 web GUI, choose **Input > Input Setup > ASI** tab.

**Step 2**
Ensure that the input you want to reacquire is enabled as the active input. For more information, see Tuning to the ASI Input, on page 46.

**Step 3**
On a single-stream unit, click **Reacquire ASI**. On a multi-stream unit, click **Reacquire ASI1** or **Reacquire ASI2**, depending on the ASI input you want to reacquire the signal.

The receiver will retune the selected input to the tuning parameters from user settings and reacquire the PSI/SI information.
The current **Acquisition State** is displayed in the **ASI Input Status** area. The status displays **Full** if the SI and PSI tables have all been found. Otherwise, it will display **Degraded** if there are missing tables or **None** if no SI or PSI tables have been found.

### Viewing the ASI Input Status

To view the ASI input status, do one of the following:

- **Web GUI:** From the D9800 web GUI, choose **Input > Input Status > ASI** tab, and refer to the **ASI Input Status** area.

- **Front Panel (single-stream unit):** From the Main Menu of the D9800 front panel, choose **Status > TS Input > Input > ASI**.

- **Front Panel (multi-stream unit):** From the Main Menu of the D9800 front panel, choose **Status > TS Input > Input > Tune Mode**, and choose an ASI input from the **Input** front panel menu.

The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.

The table below describes the current ASI input status information displayed.

<table>
<thead>
<tr>
<th>Web GUI field</th>
<th>Front Panel menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Status</td>
<td>—</td>
<td>Indicates whether the input signal is locked.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Locked - Indicates the receiver is locked to a carrier with no valid content.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lock+Sig - Indicates the receiver is locked to a carrier with valid content.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No Lock - Indicates the receiver is not locked to a carrier.</td>
</tr>
<tr>
<td>Input Rate (Mbps)</td>
<td>—</td>
<td>Indicates the bit rate of the input transport stream, in Mbps.</td>
</tr>
<tr>
<td>ASI Link</td>
<td>—</td>
<td>Indicates whether there is a transport stream link error (Error, Ok, or N/A).</td>
</tr>
<tr>
<td>ASI Transport</td>
<td>—</td>
<td>Indicates the current transport synchronization status (Error, Ok, or N/A).</td>
</tr>
<tr>
<td>ASI Packet Size (bytes)</td>
<td>—</td>
<td>Indicates the packet size (in bytes) for the ASI input (188, 204, or N/A).</td>
</tr>
</tbody>
</table>
### MPEGoIP Input

#### Note

The MPEGoIP input is only available on units with the MPEGoIP Input/Output option installed (D9800-SS-MPEGOIP), and multi-stream units (D9800-MS-MPEGOIP).

The MPEGoIP input allows a decoder to process User Datagram Protocol (UDP) or Real-time Transport Protocol (RTP)-encapsulated MPEG transport streams (protected streams) from the IP/Ethernet network. The incoming stream is either Multiple Program Transport Stream (MPTS) or Single Program Transport Stream (SPTS).

The diagram below shows an example of the D9800 receiver receiving MPEGoIP transport streams:

![Diagram of D9800 receiver receiving MPEGoIP transport streams]

#### Tuning to the MPEGoIP Input

The MPEGoIP input is only available on a single-stream unit with the MPEGoIP Input/Output option installed (D9800-SS-MPEGOIP), or a multi-stream unit (D9800-MS-MPEGOIP).

A single-stream unit allows you to tune to one RF, ASI, ABR, or IP (if applicable) input, and a multi-stream unit allows you to tune to multiple RF, ASI, ABR, and/or IP inputs.

### Web GUI field | Front Panel menu | Description
---|---|---
Acquisition State | — | Displays Full if the SI and PSI tables have all been found. Otherwise, it will display Partial if there are missing tables or None if no SI or PSI tables have been found.
Input Activation Status | Active | Indicates whether the current ASI input is activated (Yes or No).
PacketError | — | Indicates the packet error rate of the current stream.

#### Step 1
From the D9800 web GUI, choose **Input > Input Setup > IP** tab. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > IP**.

#### Step 2
From the **Interface** drop-down list, choose the port to use as an input (Data1 or Data2 for single-stream units, and Data1, Data2, Data3, or Data4 for multi-stream units).

*Note* If redundancy is enabled, Data 1 and Data 2, and Data 3 and Data 4 are redundant port pairs. For more information on redundancy, see **Setting Up Redundancy Controls for MPEG over IP Input**, on page 51.

#### Step 3
In the **MOIP Input Settings** area, click the input you want to enable and check the **Enabled** check box. Or, from the **IP1 Active** front panel menu, choose **Act** to tune to the MPEG over IP Input. If there are no inputs configured, or for
more information on configuring the IP input settings, see Configuring the MPEG over IP Input, on page 49 for more information on adding and configuring IP inputs.

Note Setting a new active input on a single-stream unit will deactivate the current active input. A multi-stream unit allows multiple active inputs.

Step 4 Click Save or apply the changes on the front panel.

---

**Configuring the MPEG over IP Input**

**Step 1** From the D9800 web GUI, choose Input > Input Setup > IP tab. Or, from the Main Menu of the D9800 front panel, choose Setup > TS Input > Input > IP.

**Step 2** Click the radio button of the input setting in the MOIP Input Settings area and click .

By default, the multi-stream units are not shipped with input information defined. You can add up to 32 IP inputs, by clicking in the MOIP Input Settings area, or choose the Ins front panel menu. The number of IP inputs allowed depends on the license installed.

**Step 3** Check the Enable check box to enable the input, and choose the input port from the Interface drop-down list. For more information, see Tuning to the MPEGoIP Input, on page 48.

**Step 4** Check the Multicast check box, or choose the isMulticast front panel menu and choose Yes, to use multicast streaming. Otherwise, uncheck Multicast, or choose No on the front panel, to listen to the unicast streams that are sent to the IP addresses of the Data1 and Data2 ports.

**Step 5** If Multicast is selected, enter the multicast destination IP address in the Address field, or choose the IP Address front panel menu.

**Step 6** In the UDP Port field, or the TS UDP front panel menu, enter the destination port number (1 to 65534). If you are expecting a transport stream with RTP encapsulation only, you must enter an even port number. For UDP encapsulated input streams, you can enter an even or odd port number.

Note FEC is only supported for RTP transport streams.

**Step 7** From the FEC Mode drop-down list, or the FEC front panel menu, choose the type of expected FEC streams for the decoder to analyze and use:

- 1D - If the FEC column stream is expected.
- 2D - If FEC column and row streams are expected.
- None - Drop all the FEC streams

**Step 8** If FEC Mode is set to 1D or 2D, enter the FEC destination UDP port number of the column FEC stream (2 to 65534, even only) in the Columns field, or the FEC1 UDP or FEC2 UDP front panel menu. We recommend that you set the columns port number to TS Destination Port + 2.

If the FEC Mode is set to 2D, in addition to entering the FEC columns port number, enter the FEC destination UDP port number of the row FEC stream in the Rows field (2 to 65534, even only). We recommend that you set the rows port number to TS Destination Port + 4.
Step 9 From the Source Selection Mode drop-down list, or the Select front panel menu, choose the method to determine which available MPEG over IP stream for each data port to use as a transport input:

- SW Map - Automatically detect and select which stream to tune to.
- User Config - Lock to the source IP input set by the user. To select the Data 1 or Data 2 streams, click User Selected Source IP, or choose the DATA1/DATA2 front panel menu. When selecting Data 1 or Data 2 on the web GUI, the Source IP Address displays the host (originator) IP address of the incoming stream, and the Present columns display whether the stream is present on the Data 1 and Data 2 ports.

Step 10 Click Save or apply the changes on the front panel.

What to do next

To view the current input status, refer to the Current Input Status area. To view the statuses on the front panel, choose Status > TS Input from the Main Menu of the front panel.

Setting up the IP Input Source Filtering

Step 1 From the D9800 web GUI, choose Input > Input Setup > IP tab. Or, from the Main Menu of the D9800 front panel, choose Setup > TS Input > Input > IP.

Step 2 Click Source Filter Setup, or choose the Idx front panel menu.

Step 3 From the Source Filtering drop-down list, or the Src Filter front panel menu, choose the source (host) filtering mode. This only applies to IGMP v3.

- None - All streams sent to specific destination IP address (multicast or unicast) and destination transport stream and FEC UDP ports are received, without source restrictions.
- White List - The unit will only receive streams from the defined list of hosts/servers (Idx and IPAddress). It will reject the streams received from the host/servers that are not defined on the list.
- Black List - The unit will allow streams from any host/server, except for the ones defined in the list of hosts/servers.

Step 4 The incoming streams are always filtered based on user-configured destination information (destination IP address and UDP ports). In addition, they can be filtered based on selected Source Filtering mode. The list of hosts/servers is displayed in the Source Filter area. To define the hosts/servers, click Insert, or press the ADV key and choose Insert on the front panel.

Step 5 If White List is set as the Source Filter, enter the IP address of a trusted server the unit is allowed to receive streams. The unit is allowed to receive streams from servers with IP addresses listed here. If Black List is set as the Source Filter, enter the IP address of a server that is not trusted. The unit is allowed to receive streams from any server, except for the servers with IP addresses listed here.

Step 6 Click Save. You can add up to 8 IP addresses.

Step 7 Click Apply.

Configuring IP De-Jittering

The de-jittering engine has the ability to de-jitter two streams simultaneously (from Data1 and Data2 ports), based on the selected PCR PID for each stream.
Setting Up Redundancy Controls for MPEG over IP Input

The Redundancy Settings allow you to configure redundancy for MPEG over IP input when an active port fails due to one of the monitored error conditions (triggers). The DATA 1 and DATA 2 connectors on the rear panel are used as redundant data ports.

Step 1
From the D9800 web GUI, choose Input > Input Setup > IP tab. Or, from the Main Menu of the D9800 front panel, choose Setup > TS Input > Input > IP.

Step 2
In the MOIP Input Settings area, click the radio button of the input settings you want to edit, and then click Advanced Settings.

Step 3
From the Algorithm drop-down list or front panel menu, choose the de-jittering algorithm (VBR or CBR).

Step 4
In the Latency field or front panel menu, set the de-jittering buffer Latency (delay), in milliseconds. If VBR is chosen, you can enter a range from 110 to 150 milliseconds to set a high buffer latency. If CBR is chosen, you can enter a range from 40 to 150 milliseconds, to set a lower latency for CBR streams.

Step 5
Apply the changes.

What to do next
To view the current latency, refer to the Current Input Status area. To view the latency information on the front panel, choose Status > TS Input from the Main Menu of the front panel.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revertive</td>
<td>If the system detects a Link Loss or TS Loss, the primary port will switch to the backup port. When using the backup port, an attempt is made to revert back to the primary port when the primary port is active again. Set the following parameters:</td>
</tr>
<tr>
<td></td>
<td>• Direct Delay - Set the time (0 to 10000 milliseconds) to wait before switching from the primary to backup data port after the system detects a failure on the primary port.</td>
</tr>
<tr>
<td></td>
<td>• Revertive Delay - Set the time (0 to 30 seconds) to wait before reverting back to the primary port once all the triggers (Link Loss or TS Loss) for the primary port are back to normal again.</td>
</tr>
<tr>
<td>Non-Revertive</td>
<td>If the system detects Link Loss, TS Loss, and/or one of the selected triggers in the Trigger area, the primary port will failover to the backup port (if active), without reverting back to the primary port. This avoids the constant switching between the two ports since the incoming packet streams cannot be validated.</td>
</tr>
</tbody>
</table>
Description

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>until the switch is made. If the backup port loses transport streams, it will revert back to the primary port, if the primary port is active. Set the following parameters:</td>
</tr>
<tr>
<td></td>
<td>• In the Trigger area, check the program-related conditions that will trigger the MPEG over IP or IP input redundancy switchover to the backup port. Check the AV Loss, PMT Loss, and/or PCR Loss check box (or choose Yes for the A/V Trigger, Prog Trigger, and/or PCR Trigger front panel menu) to detect the status of the audio/video, PMT, and/or PCR loss for the program entry being decoded. The Link Loss and TS Loss check boxes are read-only. By default, Ethernet (Link) loss and transport stream loss will always trigger a redundancy switchover to the backup port.</td>
</tr>
<tr>
<td></td>
<td>• Direct Delay - Set the time (0 to 10000 milliseconds) to wait before switching from the primary to backup data port after the system detects a failure on the primary port, or from the backup to primary port after the system detects a failure on the backup port and the primary port is active again.</td>
</tr>
<tr>
<td></td>
<td>Legacy Non-Revertive</td>
</tr>
<tr>
<td></td>
<td>If the system detects Link Loss, TS Loss, and/or one of the selected triggers in the Trigger area, the primary port will failover to the backup port (if active), without reverting back to the primary port, regardless of the backup port status.</td>
</tr>
<tr>
<td></td>
<td>• In the Trigger area, check the program-related conditions that will trigger the MPEG over IP or IP input redundancy switchover to the backup port. Check the AV Loss, PMT Loss, and/or PCR Loss check box (or choose Yes for the A/V Trigger, Prog Trigger, and/or PCR Trigger front panel menu) to detect the status of the audio/video, PMT, and/or PCR loss for the program entry being decoded. The Link Loss and TS Loss check boxes are read-only. By default, Ethernet (Link) loss and transport stream loss will always trigger a redundancy switchover to the backup port.</td>
</tr>
<tr>
<td></td>
<td>• Direct Delay - Set the time (0 to 10000 milliseconds) to wait before switching from the primary to backup data port after the system detects a failure on the primary port.</td>
</tr>
</tbody>
</table>

Step 5

By default, the backup port uses the primary port settings for transport streams (the Manual Override check box is unchecked). However, if you want the backup port to receive streams from another source, you can manually configure the backup port settings:

a) Check the Manual Override check box.

b) The Interface field displays the backup port connector name, based on the selected primary port. If it is a single-stream unit, Data2 is displayed. If it is a multi-stream unit, Data2 is displayed if Data 1 is the primary port, or Data4 is displayed if Data 3 is the primary port. This field is read-only.

c) The remaining parameters are the same as the parameters available when you configure the MPEG over IP input. For more information, see Configuring the MPEG over IP Input, on page 49.

Step 6

Apply the changes.

Reacquiring the IP Input Network Information

There are two methods to reacquiring the network: web GUI and front panel. To reacquire the network using the web GUI, follow the procedure below to retune and reacquire the selected input instance only. If you are reacquiring the network using the front panel, it retunes and reacquires all the active inputs (or the active input for a single-stream unit). To reacquire the network using the front panel, choose Setup > TS Input > Re-acquire from the Main Menu of the front panel. To view the acquisition status on the front panel, choose Status > TS Input > Input > Tune Mode from the Main Menu of the front panel.
**Step 1** From the D9800 web GUI, choose **Input > Input Setup > IP** tab.

**Step 2** Ensure that the input you want to reacquire is enabled as the active input. For more information, see Tuning to the MPEGoIP Input, on page 48.

**Step 3** In the **MOIP Input Settings** area, click the radio button of the input instance you want to reacquire the signal, and click **Reacquire**.

The receiver will retune the selected input to the tuning parameters from user settings and reacquire the PSI/SI information. The current **Acquisition State** is displayed in the **Current Input Status** area. The status displays **Full** if the SI and PSI tables have all been found. Otherwise, it will display **Degraded** if there are missing tables or **None** if no SI or PSI tables have been found.

**Viewing the IP Input Redundancy Status**

From the D9800 web GUI, choose **Input > Input Setup > IP** tab, and click **Redundancy Status**. Or, from the Main Menu of the D9800 front panel, choose **Status > TS Input > Input > IP**.

The following table describes the redundancy status information displayed:

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switchover Reason</td>
<td>REDN Switch Reason</td>
<td>Displays a description of the reason for the last redundancy switchover (Setup, EthLinkStatus, TS Status, ProgStatus, or None).</td>
</tr>
<tr>
<td>Switchover Date/Time</td>
<td>REDN Switch Time</td>
<td>Displays the last date and time for the last redundancy switchover.</td>
</tr>
</tbody>
</table>

**Viewing the IP Input Status**

From the D9800 web GUI, choose **Input > Input Setup > IP** tab and refer to the **Current Input Status** area. Or, from the Main Menu of the D9800 front panel, choose **Status > TS Input > Input > IP**.

**Note** The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.

The following table describes the current input status information displayed:

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>Active</td>
<td>Indicates whether the current IP input is activated (Yes or No).</td>
</tr>
</tbody>
</table>
### Web GUI Field | Front Panel Menu | Description
---|---|---
Signal Status | Lock | Indicates whether the input signal is locked.  
- Locked - Indicates the receiver is locked to a carrier with no valid content.  
- Lock+Sig - Indicates the receiver is locked to a carrier with valid content.  
- No Lock - Indicates the receiver is not locked to a carrier.

DR Status | — | Indicates the current disaster recovery status for the current input. The following is a list of the possible statuses:  
- Ready - The disaster recovery is set up and ready.  
- Need Config - One of the following disaster recovery settings is not yet configured: Backup ID, Backup Channel, Origin Input, or Origin Channel. In the event of a failure, the disaster recovery will not be performed. For information on how to configure disaster recovery, see Configuring the Disaster Recovery Search Path, on page 70.  
- Active - A failure has occurred on the current input, and a disaster recovery is in progress.

Input Rate (Mbps) | Rate (Mbps) | Indicates the bit rate of the input transport stream, in Mbps.

Acquisition State | — | Displays Full if the SI and PSI tables have all been found.  
Otherwise, it will display Partial if there are missing tables or None if no SI or PSI tables have been found.

Link Status | Link Status | Displays the link status of the active data port (Up or Down).

Current Intf | REDN Port | Displays the current redundancy port.

Src IP1 and Src IP2 | Data1 Host and Data 2 Host | Displays the source/host IP address of the originator.

— | Data1 Type and Data 2 Type | Displays the encapsulation type of transport stream received from the DATA1 and DATA2 ports (UDP or RTP).
## Viewing the FEC Status

From the D9800 web GUI, choose **Input > Input Setup > IP** tab, and click **FEC Status** in the **Current Input Status** area. Or, from the Main Menu of the D9800 front panel, choose **Status > TS Input > Input > IP**.

The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.

The following table describes the FEC status information displayed:

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitrate (Mbps)</td>
<td>FEC Bit Rate</td>
<td>Displays the input stream bit rate reported by the FEC decoder.</td>
</tr>
<tr>
<td>CEC</td>
<td>FEC CEC</td>
<td>Indicates the current Corrected Error Count for the received stream.</td>
</tr>
<tr>
<td>PER</td>
<td>FEC PER</td>
<td>Indicates the current Packet Error Rate of the received stream.</td>
</tr>
<tr>
<td>Rows (D) and Col (L)</td>
<td>FEC D and FEC L</td>
<td>Displays the number of FEC rows and columns (0 to 20).</td>
</tr>
<tr>
<td>Present</td>
<td>ColStrmPres and RowStrmPres</td>
<td>Indicates whether the FEC row or column streams are present.</td>
</tr>
<tr>
<td>Overhead</td>
<td>FEC Overhead</td>
<td>Displays the FEC overhead, compared to the transport stream bit rate, in percentage.</td>
</tr>
<tr>
<td>Latency</td>
<td>FEC Latency</td>
<td>Displays the delay that is introduced by the FEC decoder, in milliseconds.</td>
</tr>
</tbody>
</table>
Tuning to the ABR Input

The ABR input is only available if the ABR Input License is installed. For more information on viewing licenses, see Viewing Hardware Features and Software License Information, on page 34.

A single-stream unit allows you to tune to one RF, ASI, ABR, IP, or Zixi (if applicable) input, and a multi-stream unit allows you to tune to multiple RF, ASI, ABR, IP, and/or Zixi inputs.

---

### Step 1

From the D9800 web GUI, choose **Input > Input Setup > ABR** tab.

### Step 2

From the **Interface** drop-down list, choose the port to use as an input (Data1 or Data2 for single-stream units, and Data1, Data2, Data3, or Data4 for multi-stream units).

### Step 3

In the **ABR Settings** area, click the input you want to enable and check the **Enabled** check box. Or, from the **ABR Active** front panel menu, choose **Act** to tune to the ABR input. If there are no inputs configured, or if you want to add more inputs, see Configuring the ABR Input, on page 56 for more information on adding and configuring ABR inputs.

**Note** Setting a new active input on a single-stream unit will deactivate the current active input. A multi-stream unit allows multiple active inputs.

### Step 4

Click **Save** or apply the changes on the front panel.

---

Configuring the ABR Input

---

### Step 1

From the D9800 web GUI, choose **Input > Input Setup > ABR** tab.

### Step 2

On a single-stream unit, click the radio button of the input setting in the **ABR Settings** area and click ⬆️. By default, the multi-stream units are not shipped with input information defined. You can add up to two ABR inputs by clicking ⬆️ in the **ABR Settings** area.

### Step 3

Check the **Enable** check box to enable the input, and choose the input port from the **Interface** drop-down list. For more information, see Tuning to the ABR Input, on page 56.

### Step 4

In the **URL** field, enter the IP address or HTTP Live Streaming (HLS) URL of the web server sending the Adaptive Bitrate (ABR) transport stream. To use the an HTTP URL, you must set up the DNS server. For more information, see Configuring the DNS Server, on page 139.

### Step 5

In the **Target Latency** field, enter the delay (0 to 4294967295 ms) added from the edge of live, and rounded to the closest available fragment. If the delay is set close to fragment (M), playback will start from fragment N-M, N being the last fragment of the live playlist. Ensure that the target latency is set higher than the propagation delay. Decreasing the target latency may cause playback stalls.

The value 0 (auto) starts playback at N-10, or at the beginning of the playlist if the last one is less than 10 fragments.

### Step 6

In the **Propagation Delay** field, enter the minimum delay (0 to 4294967295 ms) allowed from the edge of live, and rounded to the closest fragment. This delay is used to account for propagation, processing, and transmission delays between the origin and the Content Delivery Network (specifically, delays between publishing the manifest, and the availability of the last fragments defined in that manifest).
The value 0 (auto) applies a default value of 3 fragments duration.

Step 7 Click **Save**.

---

**Reacquiring the ABR Input Network Information**

There are two methods to reacquiring the network: web GUI and front panel. To reacquire the network using the web GUI, follow the procedure below to retune and reacquire the selected input instance only. If you are reacquiring the network using the front panel, it retunes and reacquires all the active inputs (or the active input for a single-stream unit). To reacquire the network using the front panel, choose **Setup > TS Input > Re-acquire** from the Main Menu of the front panel. To view the acquisition status on the front panel, choose **Status > TS Input > Input > Tune Mode** from the Main Menu of the front panel.

**Step 1** From the D9800 web GUI, choose **Input > Input Setup > ABR** tab.

**Step 2** Ensure that the input you want to reacquire is enabled as the active input. For more information, see Tuning to the ABR Input, on page 56.

**Step 3** In the **ABR Settings** area, click the radio button of the input instance you want to reacquire the signal, and click **Reacquire**.

The receiver will retune the selected input to the tuning parameters from user settings and reacquire the PSI/SI information.

The current **Acquisition State** is displayed in the **ABR Status** area. The status displays **Full** if the SI and PSI tables have all been found. Otherwise, it will display **Degraded** if there are missing tables or **None** if no SI or PSI tables have been found.

---

**Viewing the ABR Input Status**

From the D9800 web GUI, choose **Input > Input Setup > ABR** tab and refer to the **ABR Status** area.

**Note** The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.

The following table describes the current input status information displayed:

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Status (or Lock for front panel)</td>
<td>Indicates whether the input signal is locked.</td>
</tr>
<tr>
<td></td>
<td>• Locked - Indicates the receiver is locked to a carrier with no valid content.</td>
</tr>
<tr>
<td></td>
<td>• Lock+Sig - Indicates the receiver is locked to a carrier with valid content.</td>
</tr>
<tr>
<td></td>
<td>• No Lock - Indicates the receiver is not locked to a carrier.</td>
</tr>
</tbody>
</table>
### Tuning to the Zixi Input

The Zixi input is only available if the ZIXI Input License is installed. For more information on viewing licenses, see Viewing Hardware Features and Software License Information, on page 34.

A single-stream unit allows you to tune to one RF, ASI, ABR, IP, or Zixi (if applicable) input, and a multi-stream unit allows you to tune to multiple RF, ASI, ABR, IP, and/or Zixi inputs.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS Rate (Mbps)</td>
<td>Displays the current bit rate of the ABR stream, in Mbps.</td>
</tr>
<tr>
<td>Acquisition State</td>
<td>Displays Full if the SI and PSI tables have all been found. Otherwise, it will display Degraded if there are missing tables or None if no SI or PSI tables have been found.</td>
</tr>
<tr>
<td>DL Rate (Mbps)</td>
<td>Displays the average fragment download rate, in Mbps.</td>
</tr>
<tr>
<td>Actual Latency</td>
<td>Displays the actual delay, in milliseconds, added from the edge of live. This is used in combination with the Target Latency setting.</td>
</tr>
<tr>
<td>Propagation Delay (ms)</td>
<td>Displays the actual minimum delay, in milliseconds, allowed from the edge of live. This is used in combination with the Propagation Delay setting.</td>
</tr>
<tr>
<td>Manifest Duration</td>
<td>Displays the HLS manifest target duration (EXT-X-TARGETDURATION), in milliseconds.</td>
</tr>
<tr>
<td>Manifest Count</td>
<td>Displays the number of manifest updates.</td>
</tr>
<tr>
<td>Fragment Count</td>
<td>Displays the number fragment chunks downloaded.</td>
</tr>
<tr>
<td>Packet Error</td>
<td>Indicates the packet error rate of the current stream.</td>
</tr>
</tbody>
</table>

**Step 1**  
From the D9800 web GUI, choose **Input > Input Setup > Zixi** tab.

**Step 2**  
From the **ZIXI Settings** area, choose the Zixi input you want to enable. By default, the multi-stream units are not shipped with input information defined. If there are no Zixi inputs configured, or if you want to add an additional input, click to add up to two Zixi inputs.

**Step 3**  
From the **Type** drop-down list, choose Pull.

**Step 4**  
From the **Interface** drop-down list, choose the port to use as an input (Mgmt, Data1, or Data2 for single-stream units, and Mgmt, Data1, Data2, Data3, or Data4 for multi-stream units).

**Step 5**  
In the **Source** field, enter the IP address or host name of the Zixi server to which you want to tune. To use the hostname, you must set up the DNS server. For more information, see Configuring the DNS Server, on page 139.

**Step 6**  
In the **Stream ID** and **Port** fields, enter the stream ID and port number of the Zixi server. You can obtain the ID from the Zixi Broadcaster application.

**Step 7**  
Check the **Enable** check box.
Setting up Redundancy Controls for Zixi Input

If you have another Zixi server on the same interface, you can set up the backup server, for redundancy purposes. If the primary server fails and you have redundancy configured, it switches to the backup server automatically. If the primary server comes back up, you must manually restore to the primary server by disabling and enabling the primary server (for more information, see Tuning to the Zixi Input, on page 58). If you do not set up redundancy, the D9800 receiver will attempt to reconnect until a connection is established.

**Step 1**  
From the D9800 web GUI, choose **Input > Input Setup > Zixi** tab.

**Step 2**  
Choose the Zixi input you want to configure redundancy settings.

**Step 3**  
Click **Redundancy Settings**.

**Step 4**  
Check the **Enable** check box to enable redundancy for the current Zixi server.

**Step 5**  
The type is set to Non-Revertive. If the system detects Link Loss, TS Loss, and/or one of the selected triggers in the **Trigger** area, the primary port will failover to the backup port (if active), without reverting back to the primary port. This avoids the constant switching between the two ports since the incoming packet streams cannot be validated until the switch is made. If the backup port loses transport streams, it will revert back to the primary port, if the primary port is active. Set the following parameters:

a)  
In the **Direct Delay** field, set the time (0 to 10000 milliseconds) to wait before switching from the primary to backup data port after the system detects a failure on the primary port.

b)  
In the **Trigger** area, check the program-related conditions that will trigger the Zixi input redundancy switchover to the backup port. Check the **AV Loss**, **PMT Loss**, and/or **PCR Loss** check box (or choose Yes for the **A/V Trigger**, **Prog Trigger**, and/or **PCR Trigger** front panel menu) to detect the status of the audio/video, PMT, and/or PCR loss for the program entry being decoded. The **Link Loss** and **TS Loss** check boxes are read-only. By default, Ethernet (Link) loss and transport stream loss will always trigger a redundancy switchover to the backup port.

**Step 6**  
In the **Interface** drop-down list, choose the backup port to use (Mgmt, Data1, or Data2 for single-stream units, and Mgmt, Data1, Data2, Data3, or Data4 for multi-stream units).

**Step 7**  
In the **Source**, **Stream ID**, and **Port** fields, enter the backup server information. For more information on the fields, see Tuning to the Zixi Input, on page 58.

**Step 8**  
In the **Decryption Key** field, enter the decryption key from the Zixi Broadcaster. It supports decryption of AES-128, AES-192, and AES-256 encrypted streams.

**Step 9**  
Click **Apply**.

Viewing the Zixi Input Redundancy Status

From the D9800 web GUI, choose **Input > Input Setup > ZIXI** tab, and click **Redundancy Status** in the **Zixi Status** area.

The following table describes the redundancy status information displayed:
Configuring the Zixi Advanced Settings

We highly recommend that you do not change the default advanced settings. If applicable, you can modify the advanced settings to improve performance.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switchover Reason</td>
<td>Displays a description of the reason for the last redundancy switchover</td>
</tr>
<tr>
<td></td>
<td>(EthLinkStatus, TS Status, ProgStatus, or None).</td>
</tr>
<tr>
<td>Switchover Date/Time</td>
<td>Displays the last date and time for the last redundancy switchover.</td>
</tr>
</tbody>
</table>

**Step 1**  
From the D9800 web GUI, choose **Input > Input Setup > Zixi tab.**

**Step 2**  
Choose the Zixi input you want to configure advanced settings.

**Step 3**  
Click **Advanced Settings.**

**Step 4**  
If applicable, set the following parameters in the **Advanced Configuration** area:

**Note**  
We highly recommend that you do not change the default settings.

a) From the **Latency Mode** drop-down list, choose **Static** if you do not want latency to change during a session, **Dynamic** if latency can increase or decrease, or **Increasing** for latency to increase.

b) Adjust the **Latency** to create a buffer for improved performance. However, increasing the latency may cause performance issues on the D9800 receiver.

c) In the **Max Jitter** field, enter the limit on the error correction jitter (0 disables the limit).

d) Check the **Stuffed NULLs** check box to insert a null packet in the output stream when a packet cannot be retried or recovered by FEC.

e) Copy and paste the decryption key from the Zixi Broadcaster UI to the **Decryption Key** field. The decryption key is used to decrypt the encoded stream from Zixi. It supports the decryption of AES128, AES192, or AES256 encrypted streams.

**Step 5**  
If applicable, set the following parameters in the **FEC Configuration** area:

a) From the **FEC Mode** drop-down list, choose **On** or **Off** to enable or disable FEC. Choose **Adaptive** to dynamically scale down FEC when there is network congestion (recommended).

b) In the **Overhead** field, enter the FEC overhead percentage, over the source bit rate.

c) In the **Block MS** field, enter the maximum time of the FEC block, in milliseconds.

d) Check the **Content Aware** check box to allow uneven FEC allocation, based on content.

**Step 6**  
Click **Apply.**

Reacquiring the Zixi Input Network Information

There are two methods to reacquiring the network: web GUI and front panel. To reacquire the network using the web GUI, follow the procedure below to retune and reacquire the selected input instance only. If you are reacquiring the network using the front panel, it retunes and reacquires all the active inputs (or the active input for a single-stream unit). To reacquire the network using the front panel, choose **Setup > TS Input > Re-acquire** from the Main Menu of the front panel. To view the acquisition status on the front panel, choose **Status > TS Input > Input > Tune Mode** from the Main Menu of the front panel.
Step 1
From the D9800 web GUI, choose **Input > Input Setup > ZIXI** tab.

Step 2
Ensure that the input you want to reacquire is enabled as the active input. For more information, see Tuning to the Zixi Input, on page 58.

Step 3
In the **ZIXI Settings** area, click the radio button of the input instance you want to reacquire the signal, and click **Reacquire**. The receiver will retune the selected input to the tuning parameters from user settings and reacquire the PSI/SI information. The current **Acquisition State** is displayed in the **ZIXI Status** area. The status displays **Full** if the SI and PSI tables have all been found. Otherwise, it will display **Degraded** if there are missing tables or **None** if no SI or PSI tables have been found.

### Viewing the Zixi Input Status

From the D9800 web GUI, choose **Input > Input Setup > Zixi** tab and refer to the **ZIXI Status** area.

The following table describes the current Zixi input status information displayed:

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Status</td>
<td>Indicates whether the input signal is locked.</td>
</tr>
<tr>
<td></td>
<td>• Locked - Indicates the receiver is locked to a carrier with no valid content.</td>
</tr>
<tr>
<td></td>
<td>• Lock+Sig - Indicates the receiver is locked to a carrier with valid content.</td>
</tr>
<tr>
<td></td>
<td>• No Lock - Indicates the receiver is not locked to a carrier.</td>
</tr>
<tr>
<td>DR Status</td>
<td>Indicates the current disaster recovery status for the current input. The following is a list of the possible statuses:</td>
</tr>
<tr>
<td></td>
<td>• Ready - The disaster recovery is set up and ready.</td>
</tr>
<tr>
<td></td>
<td>• Need Config - One of the following disaster recovery settings is not yet configured: Backup ID, Backup Channel, Origin Input, or Origin Channel. In the event of a failure, the disaster recovery will not be performed. For information on how to configure disaster recovery, see Configuring the Disaster Recovery Search Path, on page 70.</td>
</tr>
<tr>
<td></td>
<td>• Active - A failure has occurred on the current input, and a disaster recovery is in progress.</td>
</tr>
<tr>
<td>Rate (Mbps)</td>
<td>Displays the current bit rate of the Zixi stream, in Mbps.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.</td>
</tr>
<tr>
<td><strong>Web GUI Field</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Acquisition State</td>
<td>Displays Full if the SI and PSI tables have all been found. Otherwise, it will display Degraded if there are missing tables or None if no SI or PSI tables have been found.</td>
</tr>
<tr>
<td>Current Intf</td>
<td>Displays the current redundancy port.</td>
</tr>
<tr>
<td>Current Source</td>
<td>Displays the IP address or host name of the Zixi server.</td>
</tr>
<tr>
<td>ARQ Recovered</td>
<td>Displays the number of dropped packets recovered through ARQ.</td>
</tr>
<tr>
<td>FEC Recovered</td>
<td>Displays the number of FEC packets recovered.</td>
</tr>
<tr>
<td>Not Recovered</td>
<td>Displays the number of non-recovered packets.</td>
</tr>
<tr>
<td>Packet Error</td>
<td>Indicates the packet error rate of the current stream.</td>
</tr>
</tbody>
</table>

**Viewing the Current Input Status**

**Step 1**  
From the D9800 web GUI, choose **Input > Active Inputs**. Or, from the D9800 front panel menu, choose **Status > TS Input > Input > Tune Mode**.

**Step 2**  
In the **Input** column, click the radio button of the input you want to view status. Or, from the **Input** front panel menu, choose the input you want to view status.

**Step 3**  
Click the **Input Status** tab. The table below describes the status columns displayed.

**Note**  
The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.

<table>
<thead>
<tr>
<th><strong>Web GUI Field</strong></th>
<th><strong>Front Panel Menu</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Status</td>
<td>Lock</td>
<td>Indicates whether the input signal is locked.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Locked - Indicates the receiver is locked to a carrier with no valid content.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lock+Sig - Indicates the receiver is locked to a carrier with valid content.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No Lock - Indicates the receiver is not locked to a carrier.</td>
</tr>
<tr>
<td>TS ID</td>
<td>TxID</td>
<td>Displays the transport ID number (1 to 65535).</td>
</tr>
<tr>
<td>Web GUI Field</td>
<td>Front Panel Menu</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Net ID</td>
<td>NetID</td>
<td>Indicates the network ID of the uplink signal the receiver is to receive when using the selected preset (1 to 65535). The network ID of the receiver must match the network ID associated with the transmitted signal that identifies the NIT to be used. <strong>Note</strong> Each network must be assigned a unique ID number.</td>
</tr>
<tr>
<td>Tune Reason</td>
<td>Tune Reason</td>
<td>Indicates how the tuning parameters were last saved.</td>
</tr>
<tr>
<td>Acquisition State</td>
<td>Acquisition State</td>
<td>Displays Full if the SI and PSI tables have all been found. Otherwise, it will display Degraded if there are missing tables or None if no SI or PSI tables have been found.</td>
</tr>
<tr>
<td>Network Name</td>
<td>—</td>
<td>Indicates the name assigned to the network.</td>
</tr>
<tr>
<td>Input Rate (Mbps)</td>
<td>Rate (Mbps)</td>
<td>Indicates the bit rate of the input transport stream, in Mbps.</td>
</tr>
<tr>
<td>Scrambling Mode</td>
<td>—</td>
<td>Displays the scrambling mode of the transport stream from the current input (Unknown, DES, DVB, BISS1, BISS2, or BISS3).</td>
</tr>
<tr>
<td>Packet Error</td>
<td>—</td>
<td>Indicates packet error rate of the current stream.</td>
</tr>
</tbody>
</table>

### Setting Up the Tuning Information

**Note** If the unit is in a disaster recovery or NIT retune recovery mode, an error message is displayed, informing you that any changes made to the page will interrupt the disaster recovery or NIT retune process. The error message appears when you load, refresh, or apply changes to the page. For more information on NIT retune, see NIT Retune Recovery, on page 69. For more information on disaster recovery, see Disaster Recovery, on page 66.

**Step 1**
From the D9800 web GUI, choose **Input > Active Inputs**. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Tune Mode**.

**Step 2**
In the **Input** column, click the radio button of the input you want to set the tuning mode, or choose the input from the **Input** front panel menu.

**Step 3**
Click **SI Receive Setup**.

**Step 4**
In the **Network ID** field, or the **NetID** front panel menu, enter the network ID of the uplink signal the receiver is to receive when using the selected preset. The network ID of the receiver must match the network ID associated with the...
transmitted signal that identifies the NIT to be used. You can enter a value in the range from 1 to 65535. The default is 1.

**Step 5**

From the **CA Mode** drop-down list, or the **CA Ctl** front panel menu, choose how the conditional access will attempt to descramble the scrambled programs. The behavior of this setting is different between PowerVu streams and those that require a CAM.

For PowerVu Streams:

- **Std** - In standard mode, if a program is not authorized, even if some services are not scrambled, the whole program will not be authorized.
- **Open** - In open mode, if a program is not authorized, any services in the program that are not scrambled will still be available.

For Non-PowerVu (CAM) streams:

- **Std** - In standard mode, if the CA system of a program is not supported by the CAM, the channel is not authorized.
- **Open** - In open mode, all the CA systems of a program are validated by the CAM. The channel is always authorized.

**Step 6**

From the **Acquisition Mode** drop-down list, or the **Tune Mode** front panel menu, choose the tables required for the service list creation and signal acquisition. The selections are Auto, Basic, or Custom. The default is Basic. If you choose Basic, it requires NIT to be present. If you choose Auto, it uses all the available service list tables and it will acquire if any table is present. If you choose Custom, you must define the custom tuning parameters. For more information, see **Customizing the SI Receive Settings**, on page 64.

**Note**

When editing the tuning, the device is in a transient state while acquiring tuning information and channel lists. The receiver reverts to the previous set of tuning settings/information and channels until these changes are either saved or abandoned.

**Step 7**

Apply your changes.

---

## Customizing the SI Receive Settings

**Step 1**

From the D9800 web GUI, choose **Input > Active Inputs**, or from the front panel, choose **Setup > TS Input > Tune Mode**.

**Step 2**

In the **Input** column, click the radio button of the input or choose the input you want to customize SI settings, or choose the input from the **Input** front panel menu.

**Step 3**

Click **SI Receive Setup**.

**Step 4**

Ensure that the **Acquisition Mode** or **Tune Mode** front panel menu is set to Custom and refer to the **Custom Tuning Mode** area.

**Step 5**

From the **Frequency Tuning Mode** drop-down list, or the **Frequency Tuning** front panel menu, choose the mode that determines whether to use the NIT to tune to other transports, or to force the tuning to user configuration settings. Choose **NIT** and the receiver can change tuning parameters to use all transports available in the NIT. Choose **User Cfg** to force the receiver to use the user selected tuning parameters.

**Step 6**

The **Service List Mode** drop-down list or front panel menu determines which tables are required for tuning. Rigorous requires all service list tables to be present to acquire the signal. Relaxed requires any service list table to be present to acquire the signal.
Step 7 Refer to the Service List Contributors area.

Step 8 From the Network Information Table (NIT), Service Description Table (SDT), and/or Program Association Table (PAT) drop-down lists (or the NIT, SDT, and/or PAT front panel menus), choose Yes to use the NIT, SDT, and/or PAT when creating the service list.

Step 9 Click OK and apply your changes.

Viewing the Tuning Status

Step 1 From the D9800 web GUI, choose Input > Active Inputs. Or, from the D9800 front panel, choose Status > TS Input > Input > Tune Mode.

Step 2 From the Input column, click the radio button of the input you want to view the tuning status, or choose the input you want to view the tuning status from the Input front panel menu.

Step 3 Click the SI Status tab.

The table below describes the SI and service information displayed.

<table>
<thead>
<tr>
<th>Web GUI Menu</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service List Mode</td>
<td>Service List Mode</td>
<td>Indicates if all the expected service list tables are present (Rigorous) or only some of the service list tables are present (Degraded).</td>
</tr>
<tr>
<td>Frequency Tuning Mode</td>
<td>—</td>
<td>Indicates whether tuning is using the NIT to tune to other transports, or whether tuning is forced to use the user selected parameters.</td>
</tr>
<tr>
<td>Source of Last Tuning</td>
<td>Tune Reason</td>
<td>Indicates how the tuning parameters were last saved.</td>
</tr>
<tr>
<td>Acquisition State</td>
<td>Acquisition State</td>
<td>Displays Full if the SI and PSI tables have all been found. Otherwise, it will display Degraded if there are missing tables or None if no SI or PSI tables have been found.</td>
</tr>
<tr>
<td>TS ID</td>
<td>TxID</td>
<td>Displays the transport ID number (1 to 65535).</td>
</tr>
<tr>
<td>Net ID</td>
<td>NetID</td>
<td>Indicates the network ID of the uplink signal the receiver is to receive when using the selected preset (1 to 65535). The network ID of the receiver must match the network ID associated with the transmitted signal that identifies the NIT to be used.</td>
</tr>
</tbody>
</table>

Note Each network must be assigned a unique ID number.
### Disaster Recovery

In the event of a transmission failure on the primary feed, the disaster recovery allows for continued programming, with limited to no downtime. The D9800 supports a local disaster recovery implementation, which uses the disaster recovery settings configured on the D9800 receiver. There are two types of disaster recovery:

- **RF input disaster recovery** - If a failure occurs on an active RF input, it can only tune to another RF input, depending on the search path defined. This is supported on single-stream units only.

- **MOIP input and Zixi input disaster recovery** - If a failure occurs on an active MOIP or Zixi input, it can tune to another MOIP or Zixi input, depending on the search path defined.

By default, the disaster recovery is enabled. The lowest PE number determines the search path. The search path is shown on the Disaster Recovery Status page. To set up and view the disaster recovery parameters, see Enabling the Disaster Recovery Settings, Configuring the Disaster Recovery Search Path, on page 70, and Viewing the Disaster Recovery Status, on page 71.

### RF Input Disaster Recovery

The RF input failure condition could be triggered by one of the following events:

- RF Lock Loss
- Unstable RF signal
- Transport Loss (RF locked, but no transport stream packets and NULL packets received)

Once the receiver detects a failure after the configured signal loss timeout, it will initiate a disaster recovery search based on the search path determined by the disaster recovery configuration. The web GUI displays a D/R in progress status. During a disaster, the receiver will attempt to tune to a different backup transport, based on the search path configured. The origin transport consists of origin transport tuning parameters and PE service IDs, configured in the Input menus. For more information on the Input parameters, see Tuning to an RF Input, on page 39.

---

**Note**

If you perform a master PE channel change during a disaster recovery search, the search will end, the current tuning parameters will be locked, and the current channel will become the origin channel. If you perform a tuning change during a disaster recovery search, the search will end, the current user tuning parameters will become the origin tuning parameters, and the origin may be updated by any of the NIT updates that follow.
The table below is an example of a disaster recovery search path, for RF input. The backup ID is configured by the user. An active RF input can only be backed up by another RF input type. You must configure the tuning parameters for the backup ID. For more information, see Adding a Backup Node, on page 69.

**Table 1: Example of RF Input Disaster Recovery Search Path**

<table>
<thead>
<tr>
<th>Program Entry</th>
<th>Origin Transport - Input and Channel Number</th>
<th>Backup 1 Transport - Backup ID and Channel Number</th>
<th>Backup 2 Transport - Backup ID and Channel Number</th>
<th>Backup 3 Transport - Backup ID and Channel Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE1</td>
<td>RF1, 101</td>
<td>Uplink1 (RF input type), 11</td>
<td>Uplink2 (RF input type), 101</td>
<td>Uplink3 (RF input type), 801</td>
</tr>
<tr>
<td>PE2</td>
<td>RF1, 2</td>
<td>Uplink1 (RF input type), 12</td>
<td>—</td>
<td>Uplink3 (RF input type), 1005</td>
</tr>
</tbody>
</table>

When disaster occurs on RF1, the receiver will tune to Uplink1 (RF parameters) on backup node, as defined on the Backup 1 transport. If the acquisition is successful on the backup 1 transport (PAT is received), the receiver will set PE 1 to channel 11 and PE2 to channel 12 on Uplink1 backup node, and declare that the disaster is over.

If the acquisition fails or there is no signal lock on the backup 1 transport, the receiver will continue to search for the next backup transport for PE1 (Backup 2 transport). If the acquisition is successful on the backup 2 transport, the receiver will set PE1 to channel 101, but leave PE2 to channel 2 because PE2 is not specified for Backup 2 transport.

If the acquisition fails or there is no signal lock on the backup 2 transport, it will continue the search path and set PE1 to channel 801 and PE2 to channel 1005 if the acquisition is successful on the backup 3 transport. However, if the acquisition fails or there is no signal lock on the backup 3 transport, the search path will continue to the origin transport. The search path will cycle through origin, backup 1, backup 2, and backup 3 infinitely.

**MOIP Input and Zixi Input Disaster Recovery**

The MOIP or Zixi failure condition could be triggered by the following event:

- Transport Loss

Once the receiver detects a failure after the configured signal loss timeout, it will initiate a disaster recovery search based on the search path determined by the disaster recovery configuration. The web GUI displays a D/R in progress status. During a disaster, the receiver will attempt to tune to a different backup transport, based on the search path configured. The origin transport consists of the input type and channel assigned to each program entry. For more information, see Assigning a Channel to a Program Entry, on page 74.

The table below is an example of a disaster recovery search path, for MOIP and Zixi inputs. The backup ID is configured by the user. You must configure the tuning parameters for the backup ID. For more information, see Adding a Backup Node, on page 69.
Table 2: Example of Multiple Input Disaster Recovery Search Path

<table>
<thead>
<tr>
<th>Program Entry</th>
<th>Origin Transport - Input and Channel Number</th>
<th>Backup 1 Transport - Backup ID and Channel Number</th>
<th>Backup 2 Transport - Backup ID and Channel Number</th>
<th>Backup 3 Transport - Backup ID and Channel Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE1</td>
<td>MOIP1, 101</td>
<td>Uplink1 (Zixi input type), 11</td>
<td>Uplink1 (Zixi input type), 101</td>
<td>Uplink3 (MOIP input type), 801</td>
</tr>
<tr>
<td>PE2</td>
<td>MOIP1, 2</td>
<td>Uplink1 (Zixi input type), 12</td>
<td>—</td>
<td>Uplink3 (MOIP input type), 1005</td>
</tr>
<tr>
<td>PE3</td>
<td>MOIP2, 6</td>
<td>Uplink2 (Zixi input type), 17</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PE4</td>
<td>MOIP2, 7</td>
<td>Uplink 3 (MOIP input type), 9</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

When disaster occurs on MOIP1, the receiver will tune to Uplink1 (Zixi parameters) on backup node, as defined on the Backup 1 Transport. If the acquisition is successful on the backup 1 transport, the receiver will set PE1 to channel 11 and PE2 to channel 12 on Uplink1 backup node, and declare that the disaster recovery is over.

If the acquisition fails or there is no signal lock on the backup 2 transport, it will continue the search path and set PE1 to channel 101 on Uplink3 backup node, if the acquisition is successful on the backup 3 transport. However, if the acquisition fails or there is no signal lock on the backup 3 transport, the search path will continue to the origin transport. The search path will cycle through origin, backup 1, backup 2, and backup 3 infinitely.

During recovery of one input, if another input goes down, or disaster is declared on another input, there will be no attempt to recover the origin input until one cycle of the previous search is complete.

If a channel change is performed in the middle of the search, disaster recovery will stop and the search will restart from the beginning.

If a channel change is performed while the unit is successfully tuned to a disaster recovery backup signal, the new disaster recovery channel and input type becomes the new origin channel and input type. The following lists two examples:

- Example 1: MOIP1 (User) has declared disaster, and is now switched to MOIP1 (backup). If you perform a channel change, MOIP1 (backup) is now the origin. The user settings will not be part of the search path because the origin is overwritten by the backup.

- Example 2: MOIP1 (User) has declared disaster, and is now switched to Zixi1 (backup). If you perform a channel change, the Zixi1 (backup) is now the origin, and all the corresponding PEs and channels will become the origin channels. The MOIP1 search path will no longer be valid because the origin is overwritten by the Zixi1 backup. The user settings of MOIP1 will be deactivated, and reacquire will not be done automatically. To activate the input again, you must manually enable the MOIP1 input (for details, see Tuning to the MPEGoIP Input, on page 48), or restore a previous backup file.
NIT Retune Recovery

NIT retune is only available on the single-stream units only.

The Network Information Table (NIT) retune recovery occurs when the tuning parameters on the uplink do not result in a successful tuning lock (for example, modulator settings or transponder signal strength).

The receiver will try to tune to the new signal (NIT), and if it does not lock to the new signal during an initial engagement delay of five minutes, it will revert back to the original signal. If it cannot lock to the original signal, it will try the new signal again and attempt to lock within an engagement delay period that is twice the value of the current disaster recovery Signal Lock Timer (see Viewing the Disaster Recovery Status, on page 71). The unit will continue to alternate between the new signal and the original signal for up to one hour. If the unit does not lock to a signal after one hour, it will trigger a disaster recovery. The unit must stay locked to the new signal (NIT) for a minimum of ten minutes.

If another NIT is received before the ten minute timer, the ten minute timer is canceled, the initial engagement delay period for the next NIT retune resets back to the engagement period that is twice the value of the current disaster recovery Signal Lock Timer, and the NIT retune process restarts.

If the existing signal remains locked during and after the ten minute period, and no other NIT was received during that period, the current locked signal (NIT) becomes the default NIT, the initial engagement period for a future NIT retune is reset back to five minutes, and the unit is then ready for a future NIT retune.

Adding a Backup Node

Step 1  From the D9800 web GUI, choose Input > Disaster Recovery.

Step 2  In the Backup Table area, click + to add a backup node. If you want to edit an existing backup node, click the radio button of a node and click .

Step 3  In the Backup ID field, enter the name of the backup node.

Step 4  From the Input Type drop-down list, choose the type of input for the node. For a single-stream unit, RF, MOIP, and Zixi input types are supported. For a multi-stream unit, only MOIP and Zixi input types are supported.

Note  If the active input on a single-stream unit is RF, only a backup node with an RF input type can be selected.

Step 5  Click Save.

Step 6  Click the radio button of the backup node you want to configure.

Step 7  Click Backup Configuration and configure the tuning parameters of the backup node. Depending on the input type selected, the appropriate parameters are displayed. Redundancy settings are not supported for backup nodes. For more information on the parameters, see Configuring the RF Tuning Parameters, on page 40 for RF parameters, Configuring the MPEG over IP Input, on page 49 for MOIP parameters, or Tuning to the Zixi Input, on page 58 and Configuring the Zixi Advanced Settings, on page 60 for Zixi parameters.

Note  If the tuning parameters are identical to a current active input, the D9800 will bypass the backup with the identical tuning parameters and move to the next backup.
Step 8  Click Apply.

---

**Configuring the Disaster Recovery Search Path**

**Note**  Disaster recovery is available in Advanced mode only. For more information on Advanced mode, see Basic Vs. Advanced Mode, on page 23.

The *Search Path* area determines the search order of backup transports when a disaster occurs. This is only applicable if the Disaster Recovery Profile is set to Local. For a list of triggers, see Disaster Recovery, on page 66. During a disaster, the unit will attempt to tune to the backup transport, based on the Search Path configured. The table displays the origin and backup channels for PE1 to PE16.

The *Origin Input* and *Origin Channel* columns display the input and channel assigned to each program entry. For more information, see Assigning a Channel to a Program Entry, on page 74.

Disaster Recovery supports up to three backups.

---

**Step 1**  From the D9800 web GUI, choose **Input > Disaster Recovery**.

**Step 2**  Refer to the *Search Path* area.

**Step 3**  From the **Backup 1 ID** drop-down list, choose the backup node, as defined in the **Backup Table** area, for the specified program entry. For information on adding backup nodes, see Adding a Backup Node, on page 69.

**Note**  We recommend that if you are setting the backup RF node for a single-stream unit, ensure that the backup RF input is not the same as the active RF input. For example, if the active RF input is RF1, use RF2, RF3, or RF4 as the backup RF input.

**Step 4**  In the **Backup 1 Channel** field, enter a channel number.

**Note**  We recommend that you configure a minimum of one backup transport. If no backup transports are configured, the origin input and channel is used.

The configured backup is enabled.

**Step 5**  Repeat Step 3 and Step 4 for Backup 2 and Backup 3, as required.

**Step 6**  Click **Apply**.

If a disaster recovery is in progress, a message is displayed, recommending that you do not apply the setup changes during a disaster recovery. Click **Close**. If you want to save your changes during a disaster recovery, click **Apply** again. The warning message is displayed again. Click **OK** to confirm your changes. The changes are saved.

---

**Enabling the Disaster Recovery Settings**

By default, the disaster recovery feature is enabled.
Disaster recovery is available in Advanced mode only. For more information on Advanced mode, see Basic Vs. Advanced Mode, on page 23.

Note

If the unit is in a disaster recovery or NIT retune recovery mode, an error message is displayed, informing you that any changes made to the page will interrupt the disaster recovery or NIT retune process. The error message appears when you load, refresh, or apply changes to the page. For more information on NIT retune, see NIT Retune Recovery, on page 69. For more information on disaster recovery, see Disaster Recovery, on page 66.

Note

Step 1

From the D9800 web GUI, choose Input > Disaster Recovery.

Step 2

From the Enable Disaster Recovery drop-down list, choose to enable or temporarily disable the disaster recovery feature. Choose Yes (default) to enable disaster recovery. Choose No to set the disaster recovery into maintenance mode. It will automatically set the Disaster Recovery back to Yes after five minutes. This prevents the user from accidentally disabling disaster recovery permanently. To disable disaster recovery, remove all the disaster recovery configurations from the Search Path area below.

The maintenance mode allows you to perform any maintenance operations (such as IP setup), without the unit declaring disaster and initiate a disaster recovery search path.

The default is set to Yes, the disaster recovery is not operational until the Search Path is configured. For information on setting up the search path, see Configuring the Disaster Recovery Search Path, on page 70.

Step 3

The Disaster Recovery Profile is set to Local, which uses the disaster recovery settings configured on the receiver.

Step 4

In the Signal Lock Period field, enter the time, in seconds, the unit must wait for a signal lock before declaring that the signal is not usable and move on to the next search location in the search path. You can enter a value in the range from 5 to 255 seconds. The default is 30 seconds.

Step 5

In the Signal Loss Period field, enter the time, in seconds, the unit must wait (after detecting a signal loss) before declaring a disaster. You can enter a value in the range from 5 to 2160000 seconds. The default is 30 seconds.

Step 6

In the Signal Verify Period field, enter the time, in seconds, the unit must wait for the PAT table to verify the signal has a valid transport. You can enter a value in the range from 10 to 255 seconds. The default is 60 seconds.

Step 7

Apply your changes.

Viewing the Disaster Recovery Status

Disaster recovery is available in Advanced mode only. For more information on Advanced mode, see Basic Vs. Advanced Mode, on page 23.

From the D9800 web GUI, choose Input > Disaster Recovery Status.

The State field displays the current disaster recovery status. The table below lists the possible statuses.
The unit is in a normal state and no disaster recovery is in progress. It is set to use the local or uplink disaster recovery settings (depending on the Configured By field).

**D/R in progress**
The unit has detected a loss of input and if the **Configured By** field displays User, it searches for a backup transport using the configured search path. The configured search path is displayed in the **Backup Transport** area.

**D/R disabled - Maintenance Mode**
The disaster recovery feature is disabled. The unit is in maintenance mode. To enable disaster recovery, see **Enabling the Disaster Recovery Settings**, on page 70.

**NIT Retune Recovery in progress**
The NIT retune recovery is in progress. For more information on NIT retune, see **NIT Retune Recovery**, on page 69.

The **Configured By** field displays User the current disaster recovery setting. The unit is using the disaster recovery settings configured locally.

The **Signal Lock Timer** field indicates the time, in seconds, the unit must wait for a signal lock before declaring a disaster. The **Signal Loss Timer** field indicates the time, in seconds, the unit must wait (after detecting a signal loss) before declaring a disaster. The **Verification Timer** field indicates the time, in seconds, the unit must wait for the PAT table to verify the signal has a valid transport. If the **Configured By** field is set to User, it displays the time set by the local unit. If the **Configured By** field is set to UpLink, it displays the time set by the PNC uplink. But if the unit is not connected to the uplink, the default value of the unit is displayed. For more information, contact your PNC uplink administrator.

The **Backup Transport** area displays the defined backup nodes. To view the parameters of a specific node, click the radio button of a backup node, and then click **Backup Status**.

The **Search Path** area displays the backup node and the channel numbers assigned to the Original and Backup transports for PE1 to PE16.

### Setting Up Muting Thresholds Controls

The muting threshold controls allow you to set the muting thresholds for both audio and video, in the event of a noisy signal.

#### Note
This is available in Advanced mode only. For more information, see **Basic Vs. Advanced Mode**, on page 23.

#### Step 1
From the D9800 web GUI, choose **Input > Muting Thresholds**, or from the Main Menu of the D9800 front panel, choose **Setup > NoiseCutoff**.

#### Step 2
Check the **Enable Threshold Muting** check box (or choose the Muting Control front panel menu and choose Enable) to mute the transport stream and audio, in the event of an unstable, poor, or loss of signal condition. The default is checked or enabled.

#### Step 3
The **Transport Mute** for both DVB-S C/N Margin (dB) and DVB-S2 C/N Margin (dB) (or the Trnsprt(DVBS Marg) Cuttoff and Trnsprt(DVBS2 Marg) Cutoff front panel menus) sets the DVB-S and DVB-S2 Carrier to Noise margins,
in dB, below the transport outputs that will be muted. The receiver uses these thresholds to determine when to mute the transport in the event of a noisy, poor, or loss of signal condition. The adjustable operating range is from -30.0 to 30.0 dB. This setting must be below the respective Restore value. The default setting is 0.0.

**Note** The Enable Threshold Muting check box on the web GUI or the Muting Control front panel menu must be checked or enabled for these settings to be active.

**Step 4**

The Transport Restore for both DVB-S C/N Margin (dB) and DVB-S2 C/N Margin (dB) (or the Trnsprt (DVBS Marg) Restore and Trnsprt(DVBS2 Marg) Restore front panel menus) sets the DVB-S and DVB-S2 Carrier to Noise margins, in dB, above the transport outputs that will be muted. The receiver uses these thresholds to determine when to restore the transport after it has been muted. The adjustable operating range is from -30.0 to 30.0 dB. This setting must be above the respective Mute value. The default setting is 0.1.

**Note** The Enable Threshold Muting check box on the web GUI or the Muting Control front panel menu must be checked or enabled for these settings to be active.

The following displays the Transport Default C/N Margin Relationship:

---

**Step 5**

The Audio Mute for both DVB-S C/N Margin (dB) and DVB-S2 C/N Margin (dB) (or the Audio(DVBS Marg) Cutoff and Audio(DVBS2 Marg) Cutoff front panel menus) sets the DVB-S and DVB-S2 Carrier to Noise margins, in dB, below the audio outputs that will be muted. The receiver uses these thresholds to determine when to mute the audio in the event of a noisy, poor, or loss of signal condition. The adjustable operating range is -30.0 to 30.0 dB. This setting must be below the respective Restore value. The default setting is 0.0.

**Note** The Enable Threshold Muting check box on the web GUI or the Muting Control front panel menu must be checked or enabled for these settings to be active.

**Step 6**

The Audio Restore for both DVB-S C/N Margin (dB) and DVB-S2 C/N Margin (dB) (or the Audio(DVBS Marg) Restore and Audio(DVBS2 Marg) Restore front panel menus) sets the DVB-S and DVB-S2 Carrier to Noise margins, in dB, above the audio outputs that will be restored. The receiver uses these thresholds to determine when to restore the audio after it has been muted. The adjustable operating range is from -30.0 to 30.0 dB. This setting must be below the respective Mute value. The default setting is 0.1.

**Note** The Enable Threshold Muting check box on the web GUI or the Muting Control front panel menu must be checked or enabled for these settings to be active.
The following displays the Audio Default C/N Margin Relationship:

Step 7  Apply your changes.

Restoring to Default Muting Thresholds

To restore the default muting threshold settings, click Reset Defaults from the Muting Thresholds web GUI page (Input > Muting Threshold), or choose Setup > Noise Cutoffs > Restore Defaults on the front panel.

Assigning a Channel to a Program Entry

For single-stream units, only PE1 supports PowerVu descrambling.

Note  This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23.

There are two methods of assigning a channel: web GUI or front panel. To assign a channel using the web GUI:

a) From the D9800 web GUI, choose Input > Channel Selection.

b) On a single-stream unit, the Input column displays which input is used (RF, ASI, or MOIP). On a multi-stream unit, you can choose the active input to use from the Input drop-down list. The list of channels available is updated according to the input selected. If only one input is assigned to the PEs, it is in a single input mode. If multiple inputs are assigned to the PEs, it is in a multi input mode. The following DPM changes are made automatically when multiple inputs are assigned to the PEs. They cannot be changed in multi input mode.
   • Unreferenced Content is set to Drop.
   • All PEs with Action set to Pass is changed to Drop.
• Remapping Mode is set to Svc ID & PID.
• Duplication Method is set to Pkt Copy.
• CAT, ECM, EMM, and DRT tables is set to Drop.
• Block CDT Output is checked.

**Note** You can override this setting by unchecking **Block CDT Output** when in multi input mode.

c) From the Channel: Channel Name drop-down list, choose or enter a channel number for up to 16 program entries on a single-stream unit, or 32 program entries on a multi-stream unit. The number of program entries on a multi-stream unit depends on the transcoding licenses available.

The Not Licensed status indicates that there are not enough transcode licenses for the program entry.

d) Apply the changes.

To assign a channel using the front panel:
a) From the D9800 front panel, press MENU until you display the startup screen. The PE (Program Entry) channel is initially displayed. PE1 is the default.
b) Press ADV to choose the program entry.
c) Press the up and down arrow buttons to scroll through the available program entries (up to 16 program entries for a single-stream unit, or 32 program entries for a multi-stream unit) and stop at the program entry you want to assign a channel.
d) Press ADV again to choose the channel number.
e) Directly enter the channel number using the 0 to 9 buttons and press SELECT to apply the channel number, or press the up and down arrow buttons to scroll through the available channels and press SELECT to apply the selected channel.

To remove a channel number, press the 0 button and press SELECT to apply and delete the channel from the program entry.

---

### Viewing the Channel Status

From the D9800 web GUI, choose **Input > Channel Status**, or from the Main Menu of the D9800 front panel, choose **Status > General or Program PIDs**.

The following table describes the channel information displayed:

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>Status &gt; Program PIDs &gt; PE</td>
<td>Indicates the Program Entry number (PE1 to PE16 for single-stream units, or PE1 to PE32 for multi-stream units).</td>
</tr>
<tr>
<td>Input Name</td>
<td>—</td>
<td>Displays the name of the active input assigned to the program entry.</td>
</tr>
<tr>
<td>Channel</td>
<td>—</td>
<td>Displays the input channel of the current PE. The channel is displayed in a range from 1 to 65535.</td>
</tr>
</tbody>
</table>
### Viewing the Service Replacement Status

From the D9800 web GUI, choose **Input > Channel Status**, and click **SR Status**. Or, from the Main Menu of the D9800 front panel, choose **Status > TS Input > Program Status**.

The following table describes the service replacement information displayed:

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>PE</td>
<td>Indicates the Program Entry number (PE1 to PE16 for single-stream units, or PE1 to PE32 for multi-stream units).</td>
</tr>
</tbody>
</table>
### Web GUI Field

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR Status</td>
<td>SR Status</td>
<td>Displays the status of an alternate authorized program/service from the same transport stream when the receiver is not authorized to view the primary program. This is an uplink initiated function that maps the alternate service to the original (primary) service PIDs, replacing the original service with the alternate service at the digital transport output. No local intervention is required by the receiver operator for provision of this service replacement feature. The statuses are Not Started, Primary, or Alternate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Not Started - Indicates that an event has not started.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Primary - Indicates that a service replacement event is active, but the primary program is being displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Alternate - Indicates that a service replacement event is active, and that the receiver has tuned to and is displaying the alternate program/event as it is not authorized to view the scheduled event.</td>
</tr>
<tr>
<td>SR Type</td>
<td>SR Event Type</td>
<td>Indicates the type of service replacement event.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- None - Indicates that no service replacement event is scheduled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Scheduled - Indicates that all receivers will tune to the alternate program at the scheduled time. This status applies to PE1 (PowerVu) on a single-stream unit only. It applies to all PEs on a multi-stream unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- CA - Indicates that only receivers unauthorized to view the scheduled program will tune to the alternate program according to the selected authorization tier bits. This status applies to PE1 (PowerVu) on a single-stream unit only. It applies to all PEs on a multi-stream unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Cue Trigger - Indicates that only receivers authorized by the Cue Trigger mask will tune to the scheduled program/event. Cue triggers can only be initiated /controlled on PE1 (PowerVu).</td>
</tr>
</tbody>
</table>

**Note**  This is supported on single-stream units only.
Viewing Incoming Stream Details

Viewing PSI Tables

You cannot make any changes in the Program-Specific Information (PSI) tables, and can only view the PSI tables received and their settings.

From the D9800 web GUI, choose Input > PSI Tables. Or, from the Main Menu of the front panel, choose Diagnostics > PSI > Tables.

On a multi-stream unit, choose the active input you want to view the PSI tables from the List of Inputs drop-down list. On the front panel of a multi-stream unit, the PSI tables information displayed is based on the first input activated. The order of the inputs activated is displayed on the Active Inputs page (Input > Active Inputs). The Input column displays the order, from the first input activated listed first, to the last input activated listed last.

The table below lists the PSI tables information.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web GUI Field</td>
<td>Web GUI Field Description</td>
</tr>
<tr>
<td>SR Start or End Time</td>
<td>Displays the start or end time of the service replacement event, when</td>
</tr>
<tr>
<td></td>
<td>scheduled; otherwise, the default start time is displayed. The default</td>
</tr>
<tr>
<td></td>
<td>start time is 2007/09/01 00:00:00.</td>
</tr>
<tr>
<td>Type</td>
<td>Indicates the MPEG table acronym (PAT, CAT, PMT, TSDT, NIT, NIT Other,</td>
</tr>
<tr>
<td></td>
<td>SDT, SDT Other, BAT, AEIT P/F, OEIT P/F, TDT, RST, ST, TOT, DIT, SIT, ECM</td>
</tr>
<tr>
<td></td>
<td>Odd, ECM Even, EMM, DPI, DRT, CDT, MCT, MIT, MAT, ECT, or Invalid Table ID).</td>
</tr>
<tr>
<td>Tbl-ID Extension</td>
<td>Displays the MPEG/DVB Table ID.</td>
</tr>
<tr>
<td>Status</td>
<td>Indicates the reception status of the table (None, Partial, Full, Update,</td>
</tr>
<tr>
<td></td>
<td>Timeout, or Lost).</td>
</tr>
<tr>
<td>Ver</td>
<td>Indicates the table version number.</td>
</tr>
<tr>
<td>PID</td>
<td>Indicates the value of the PID on which the table is present.</td>
</tr>
<tr>
<td>Sections</td>
<td>Indicates the number of sections in the table.</td>
</tr>
</tbody>
</table>

Viewing PSI Frequency Table

You cannot make any changes in the PSI frequency table, and can only view the available frequency plans stored in the receiver.
From the D9800 web GUI, choose **Input > Stream Details > PSI Frequency**. Alternatively, from the Main Menu of the D9800 front panel, choose **Diagnostics > PSI > Frequency Plan**.

On a multi-stream unit, choose the active input you want to view the frequency plans from the **List of Inputs** drop-down list. On the front panel of a multi-stream unit, the frequency information displayed is based on the first input activated. The order of the inputs activated is displayed on the **Active Inputs** page (**Input > Active Inputs**). The **Input** column displays the order, from the first input activated listed first, to the last input activated listed last.

The table below lists the available frequency plans.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport Stream ID</td>
<td>TxID</td>
<td>Displays the transport ID.</td>
</tr>
<tr>
<td>Frequency (GHz)</td>
<td>Freq(GHz)</td>
<td>Displays the downlink frequency, in GHz (0.0 to 15.0 GHz).</td>
</tr>
<tr>
<td>Symbol Rate (MSym)</td>
<td>SymRate</td>
<td>Displays the symbol rate, in Mbps.</td>
</tr>
<tr>
<td>Orbital Position</td>
<td>OrbPos</td>
<td>Displays the orbital position of the satellite, in degrees (East or West).</td>
</tr>
<tr>
<td>Polarization</td>
<td>Pol</td>
<td>Displays the polarity of the received signal (H,V, or Off).</td>
</tr>
<tr>
<td>Flag</td>
<td>-</td>
<td>Displays the satellite position (in degrees), in combination with the direction (East or West).</td>
</tr>
<tr>
<td>FEC</td>
<td>FEC</td>
<td>Indicates the Forward Error Correction inner code rate (1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8, 8/9, or 9/10).</td>
</tr>
<tr>
<td>RF Modulation</td>
<td>Modulation</td>
<td>Indicates the modulation of the signal (QPSK DVB-S, QPSK DVB-S2, 8PSK DVB-S2 or 16QAM DVB-S2).</td>
</tr>
<tr>
<td>Network ID</td>
<td>ONID</td>
<td>Displays the original network ID.</td>
</tr>
</tbody>
</table>

**Viewing the PSI Channels**

You cannot make any changes in the PSI Channel table and can only view the available channels and their settings.

From the D9800 web GUI, choose **Input > Stream Details > PSI Channel**. Or, from the Main Menu of the D9800 front panel, choose **Diagnostics > PSI > Channels**.

On a multi-stream unit, choose the active input you want to view the available channels from the **List of Inputs** drop-down list. On the front panel of a multi-stream unit, the PSI channel information displayed is based on the first input activated. The order of the inputs activated is displayed on the **Active Inputs** page (**Input > Active Inputs**). The **Input** column displays the order, from the first input activated listed first, to the last input activated listed last.

The table below lists the PSI channel information.
Viewing the PID Input Status

You cannot make any changes in the PID Input Status table and can only view the available channels and their settings.

From the D9800 web GUI, choose Input > Stream Status > PID Input Status. Alternatively, from the Main Menu of the front panel, choose Status > TS Input > Program PIDs. The table below lists the PID input status information.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE Index</td>
<td>PE</td>
<td>Indicates the Program Entry number (PE1 or PE16).</td>
</tr>
<tr>
<td>Input Name</td>
<td>—</td>
<td>The name of the active input assigned to the program entry.</td>
</tr>
<tr>
<td>Type</td>
<td>Stream</td>
<td>Name assigned to the Program Entry, up to 4 alphanumeric characters.</td>
</tr>
<tr>
<td>Detail</td>
<td>Detail</td>
<td>Displays any detail associated with the program PID (for example, MPG2 PID). The parameters are: MPG1 VID, MPG2 VID, 422 VID, H264 VID, HD VID, MPEG2 VID, MPG AUD, MPG2 AUD, DVB AC3, DVB DDP, AAC AUD, HEAAC, AUD, MPG4 AUD, DBE AUD, DTS AUD, DVB TXT, DVB VBI, DVB SUBT, DVB ASYN, DVB SYNS, DVB SYND, DVB MPE, DVB DCAR, DVB OCAR, SA VBI, ATSC AC3, ATSC DDP, SA UTLD, SCTE DPI, SA HSD, SA CDDL, SA WBD, SA SUBT, ECM, EMM, PCR, or UNKNOWN.</td>
</tr>
<tr>
<td>Language</td>
<td>-</td>
<td>Displays the language code carried in the PMT for the current PID, if applicable.</td>
</tr>
<tr>
<td>PID</td>
<td>PID</td>
<td>Displays the program PID number, in the range from 1 to 8192.</td>
</tr>
</tbody>
</table>
Configuring the Common Interface (CI) Information

The Common Interface (CI) slots are located behind the door of the front panel. They allow the use of a CAM (Conditional Access Module) Smart Card to decrypt purchased programming. You must be authorized to view the programming available via the Smart Card from your service provider.

### Step 1
From the D9800 web GUI, choose **Input > CI Setup**. Or, from the Main Menu of the D9800 front panel, choose **Setup > CI**.

### Step 2
From the **CI CAM QUERY Support** drop-down list, or the **Query** front panel menu, choose Enable to query the CAM prior to decryption to ensure that the card can be decrypted. The default is Disable.

### Step 3
From the **CI CAM Auto Reset** drop-down list, or the **AutoReset** front panel menu, choose Enable to automatically reset the card. The default is Disable.

### Step 4
From the **CA List Management Type** drop-down list, or the **ListMgmt** front panel menu, choose whether the Common Interface List Management should add and delete (AddDel) individual programs or update all (UpdateAll) the programs when the list changes. 

**Note** Updating all the programs will cause temporary loss of service for all the programs when another is being modified.

### Step 5
From the **TS/ONID Check** drop-down list, or the **TS_ON_ID** front panel menu, choose Enable if you want to restrict the incoming transport stream to the transport ID and transport original network ID listed below. If the incoming stream does not match the specified transport stream, the CAM will not decrypt. The default is Disable.

If you set the **TS/ONID Check** to Enable, you must define the **Transport ID** and **Original Network ID** (TS_ID and ON_ID front panel menus). If the incoming stream does not match the specified IDs here, the CAM will not decrypt. You can enter a value in a range from 0 to 65535.

### Step 6
From the **CAM TS Handling** drop-down list, or the **TS Routing** front panel menu, choose EntireTS to use the CAM to decrypt the entire transport stream, or choose ServicesOnly to use the CAM to decrypt only the PIDs being used by the active services.

### Step 7
Apply the changes.

Setting up the Common Interface Program Description

### Step 1
From the D9800 web GUI, choose **Input > CI Setup** and refer to the **Common Interface Program Description** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > CI**.

### Step 2
On a multi-stream unit, choose the input you want to assign to the program entry from the **Input Name** drop-down list. On a single-stream unit, the **Input Name** column displays the input used (RF, ASI, or MOIP). You can also set this on the Channel Selection page. For more information, see Assigning a Channel to a Program Entry, on page 74.
### Step 3
From the **Channel** drop-down list, choose or enter the channel number of the current program entry. You can also set this on the Channel Selection page. For more information, see Assigning a Channel to a Program Entry, on page 74.

### Step 4
From the **CI Slot** drop-down list or front panel menu, choose the CAM slot to use for decryption. Choose **TOP** to use the top CAM slot for decryption or choose **BOTTOM** to use the bottom CAM slot for decryption. Choose **OFF** if you do not want to assign a slot to use for decryption.

### Step 5
From the **Decryption Mode** drop-down list, or the **Decrypt** front panel menu, choose whether to decrypt the channel or to specify the specific components to decrypt (ON, OFF, Comp). Choose **ON** (default) to decrypt the entire program entry.

Choose **Comp** to decrypt specific components, as specified in the **CI Component Setup** area below. The **CI Component Setup** area allows you to insert and maintain customized records. Each record customizes the PID or stream type to decrypt. You can maintain up to 64 records, 32 records for each CAM.

**Note** This is available in Advanced mode only. For more information, see Basic Vs. Advanced Mode, on page 23.

To insert a new record, click the add (+) icon, or from the front panel, scroll to the **Idx** menu, press **ADV**, and choose **Insert**. There are various configurations when creating a new record. The following table summarizes the various methods:

<table>
<thead>
<tr>
<th>If you set by</th>
<th>Parameter Settings</th>
</tr>
</thead>
</table>
| PID ID       | 1. From the **Mode** drop-down list or front panel menu, choose PID.  
               2. In the **PID** field or front panel menu, enter the PID number. |
| Stream Type: VID, AUD, SUBT, TTX | 1. From the **Mode** drop-down list or front panel menu, choose Stream.  
               2. From the **Stream Category** field or the **Stream** front panel menu, choose the stream type (VID, AUD, SUBT, or TTX).  
               3. In the **Stream Instance** field or the **Inst** front panel menu, enter the stream instance of the stream type (1 to 64). |
| Stream Type: USER | 1. From the **Mode** drop-down list or front panel menu, choose STREAM.  
               2. From the **Stream Category** field or the **Stream** front panel menu, choose USER.  
               3. In the **Stream Type** field or the **Type** front panel menu, manually enter the stream code (0 to 255).  
               4. In the **Stream Instance** field or the **Inst** front panel menu, enter the stream instance of the stream type (1 to 64). |

### Step 6
Apply the changes.

The **System ID** area displays the system name and ID number of the CAM for the top and bottom slots.

---

## Viewing the Common Interface (CI) Status

From the D9800 web GUI, choose **Input > CI Status**, or from the Main Menu of the D9800 front panel, choose **Setup > CI > Top/Bottom Slot**.
The table below describes the CI status information displayed.

<table>
<thead>
<tr>
<th>Web GUI Column</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI Slot</td>
<td>—</td>
<td>Indicates whether it is the top slot (TOP) or the bottom slot (BOTTOM).</td>
</tr>
<tr>
<td>CAM Status</td>
<td>Status</td>
<td>Status of the CAM (Ready or Not Ready).</td>
</tr>
<tr>
<td>Sys Name</td>
<td>System Name</td>
<td>System name of the CAM.</td>
</tr>
<tr>
<td>Comp Name</td>
<td>Company Name</td>
<td>Displays the company name of the CAM.</td>
</tr>
<tr>
<td>Manufacturer Code</td>
<td>Manufacture Code</td>
<td>Displays the internal code from the manufacturer.</td>
</tr>
<tr>
<td>Manufacturer ID</td>
<td>Application Manufacture ID</td>
<td>The factory loaded application number of the CAM.</td>
</tr>
<tr>
<td>Serial Number</td>
<td>Serial Number</td>
<td>The unique serial number of the CAM.</td>
</tr>
<tr>
<td>Hardware Version</td>
<td>Hardware Version</td>
<td>The hardware version number of the CAM.</td>
</tr>
<tr>
<td>Application Version</td>
<td>Application Version</td>
<td>The software version number of the CAM.</td>
</tr>
<tr>
<td>—</td>
<td>Product Name</td>
<td>Displays the product name of the CAM.</td>
</tr>
<tr>
<td>—</td>
<td>Supported CA System IDs</td>
<td>Displays the CA system identification name of the CAM. Some CAMs may support multiple CA system IDs.</td>
</tr>
</tbody>
</table>

**Viewing the CAM Menu Options**

**Step 1**  
From the D9800 web GUI, choose **Input > CI Status**, and refer to the **MMI Display** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > CI > Top/Bottom Slot**.

**Step 2**  
From the **CI Slot** drop-down list, choose the top or bottom slot of the CAM you want to view menu options.

**Step 3**  
Click **Menu**. The menu options are displayed in the **Message** area below.

**Step 4**  
To further view a menu option, enter the menu number in the **Choice Value** field and click **Choice**. The submenus are displayed in the **Message** area below. Click **Refresh** to refresh the **Message** area, or click **Clear** to clear the **Message** area.

**Setting up the BISS Mode**

You can set the BISS mode information if BISS is the Conditional Access (CA) system type used by the program.

**Step 1**  
From the D9800 web GUI, choose **Input > BISS**. Or, from the Main Menu of the D9800 front panel, choose **Setup > CA**.
Step 2  From the **BISS Mode** drop-down list or front panel menu, choose the Basic Interoperable Scrambling System mode for the receiver (Mode 1 or Mode E). All channels assigned to the PE identified as BISS CA-controlled in the PMT will be decrypted.

Step 3  If you selected BISS Mode 1, enter a fixed 12-character BISS Mode-1 session word in the **BISS Mode-1 Session Word** field, or the **BISS-1 SW** front panel menu. Once entered it cannot be viewed and it is only displayed as asterisks (*). Contact your program provider for the session word.

Step 4  If you selected BISS Mode E, enter the 16-character BISS Mode-E session word in the **BISS Mode-E Encrypted Session Word** field, or the **BISS-E ESW** front panel menu, and the 14-character BISS Mode-E injected ID in the **BISS Mode-E Injected ID** field, or the **BISS-E IID** front panel menu. Once entered, neither of these values can be viewed and it is only displayed as asterisks. Contact your program provider for the respective session word and/or injected ID.

Step 5  Apply the changes.

---

### Viewing the Conditional Access Status

From the D9800 web GUI, choose **Input > CA Status**, or from the Main Menu of the D9800 front panel, choose **Setup > CA**.

The table below describes the CA status displayed.

<table>
<thead>
<tr>
<th>Web GUI Column</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>Id</td>
<td>The ISE number.</td>
</tr>
<tr>
<td>ISE User Address</td>
<td>User Address</td>
<td>The ISE User Address. It is a 11 digit address in the following format: ###-###-####-#.</td>
</tr>
<tr>
<td>ISE Version Number</td>
<td>ISE Version</td>
<td>The ISE version number. It consists of 7 characters.</td>
</tr>
<tr>
<td>Enc Data pkts passed</td>
<td>ADP Enc Pass</td>
<td>Indicates the number of encrypted Addressable Data Packets successfully processed. Ideally, the ADP Enc Pass and ADP Enc Total numbers should be identical.</td>
</tr>
<tr>
<td>Enc Data pkts recvd</td>
<td>ADP Enc Total</td>
<td>Indicates the number of encrypted Addressable Data Packets received. Ideally, the ADP Enc Pass and ADP Enc Total numbers should be identical.</td>
</tr>
<tr>
<td>Non-Enc Data pkts passed</td>
<td>ADP Non-Enc Pass</td>
<td>Indicates the number of non-encrypted Addressed Data Packets successfully processed. Ideally, the ADP Enc Pass and ADP Enc Total numbers should be identical.</td>
</tr>
<tr>
<td>Non-Enc Data pkts recvd</td>
<td>ADP Non-Enc Total</td>
<td>Indicates the total number of non-encrypted Addressable Data Packets received. Ideally, the ADP Non-Enc Pass and ADP Non-Enc Total numbers should be identical.</td>
</tr>
</tbody>
</table>

Click **Clear Counters** or choose **Clear ADP Counts** front panel menu to clear the Addressable Data Packet counters: packets passed, packets received, non-encrypted packets passed, and non-encrypted packets received. These values are also reset whenever the receiver is turned on, reset or power-cycled.
CHAPTER 6

Setting Up Video and Audio Information

This section describes how to set up the video and audio parameters for the D9800 Network Transport Receiver.

Note: The video and audio parameters are available on the single-stream units only.

- Setting up the Video Information, on page 85
- Configuring the HDMI Advanced Settings, on page 93
- Configuring the SDI Outputs, on page 93
- Setting up Audio Decoding, on page 95

Setting up the Video Information

**Step 1**
From the D9800 web GUI, choose Audio & Video > Video Decoding. Or, from the Main Menu of the D9800 front panel, choose Setup > Services > Video.

**Step 2**
From the Channel drop-down list, choose the channel for video decoding. The selected channel also updates the audio decoding channel.

**Step 3**
From the Primary Video Output drop-down list, or the PV Format front panel menu, choose the primary video output format for local decoding (HDMI output). The default is Auto.

- If you set the Primary Video Output to SD, you must set SDI 1 and/or SDI 2 to SD.

**Step 4**
From the SDI 1 and/or SDI 2 drop-down lists, choose the output format for the SDI 1 and/or SDI 2 ports (HD or SD). If you set the Primary Video Output to SD, you must set SDI 1 and/or SDI 2 to SD. If you set the Primary Video Output to Auto and set the SDI 1 to HD, and play a stream that is SD, the HDMI output will be SD, and the SDI 1 port will be muted.

The SDI outputs are only available on units with the SDI option installed (D9800-3G-SDI). You can also set these settings on the SDI page (Audio & Video > SDI) or the front panel menu (Setup > Outputs > SDIs).

**Step 5**
From the Standard Definition Output drop-down list, or the SD Format front panel menu, choose the actual standard definition output format of the primary video if the PV Output is set to SD. The options are: Auto, NTSC, PAL-N (AR), PAL-M, or PAL-B/G/I/D. You must use NTSC for 525-line systems and PAL-B/G/I/D for 625-line systems.

**Step 6**
From the Standard Definition Aspect Ratio drop-down list, or the TV A/R front panel menu, choose the Standard Definition aspect ratio of your TV monitor (4:3 or 16:9). The default is 4:3. Set it to the corresponding value.
Step 7
From the Selected Aspect Ratio Conversion drop-down list, or the Convert front panel menu, choose the aspect ratio that the receiver will perform on the incoming signal for the picture to be displayed correctly on your TV, based on the Standard Definition Aspect Ratio selection. The options are None, Auto, Auto AFD, 16:9 L/B, 4:3 P/B, 14:9, 4:3 CCO, and 16:9 Scale. The default is Auto.

Step 8
From the Wide Screen Signalling drop-down list, or the WSS Mode front panel menu, choose the wide screen signaling output mode. It is used to select how the receiver affects PAL WSS when it is present in the VBI line 23. The table below describes each of the options. The default is Auto.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passthrough</td>
<td>Passes WSS unmodified as received by the receiver.</td>
</tr>
<tr>
<td>Auto:Create</td>
<td>Creates WSS to output the correct aspect ratio when performing aspect ratio conversion.</td>
</tr>
<tr>
<td>Auto:Modify</td>
<td>If WSS is present in the input stream, it is modified to output the correct aspect ratio when performing aspect ratio conversion. If WSS is not present in the input, no WSS will be present in the output.</td>
</tr>
<tr>
<td>Suppress</td>
<td>Removes WSS output.</td>
</tr>
</tbody>
</table>

Step 9
Check the Enable Banner Display check box, or choose Enable from the OSD Messages front panel menu, to display alarms and warnings on the on-screen display (for example, TV monitor).

Step 10
Apply the changes.

Aspect Ratio Conversion

The table below displays the conversions performed by the receiver, based on the Standard Definition Aspect Ratio (or TV A/R) and Selected Aspect Ratio Conversion (or Convert) selected. It also displays the effect on the picture displayed by the receiver (without Auto AFD). The actual aspect ratio conversion is displayed in the Video Status area of the Video Decoding page, and the Act Conv menu of the front panel.

<table>
<thead>
<tr>
<th>Stream</th>
<th>Standard Definition Aspect Ratio or TV A/R</th>
<th>Standard Ratio Conversion or Convert</th>
<th>Aspect Ratio or Act Conv</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3</td>
<td>4:3</td>
<td>None</td>
<td>None</td>
<td>Normal Picture</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>4:3</td>
<td>4:3</td>
<td>Auto</td>
<td>None</td>
<td>No conversion</td>
<td>-</td>
</tr>
<tr>
<td>4:3</td>
<td>4:3</td>
<td>16:9 L/B</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>4:3</td>
<td>4:3</td>
<td>4:3 CCO</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>Stream</td>
<td>Standard Definition Aspect Ratio or TV A/R</td>
<td>Standard Ratio Conversion or Convert</td>
<td>Aspect Ratio or Act Conv</td>
<td>Description</td>
<td>Image</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------</td>
<td>-----------------------------------</td>
<td>-------------------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>4:3</td>
<td>4:3</td>
<td>4:3 P/B</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>4:3</td>
<td>4:3</td>
<td>14:9</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>4:3</td>
<td>4:3</td>
<td>16:9 SCALE</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>4:3</td>
<td>16:9</td>
<td>None</td>
<td>None</td>
<td>Picture is short and wide.</td>
<td><img src="image" alt="4:3 Stretch" /></td>
</tr>
<tr>
<td>4:3</td>
<td>16:9</td>
<td>Auto</td>
<td>4:3 P/B</td>
<td>Uses 4:3 P/B.</td>
<td><img src="image" alt="4:3 P/B" /></td>
</tr>
<tr>
<td>4:3</td>
<td>16:9</td>
<td>16:9 L/B</td>
<td>None</td>
<td>Conversion is not possible. Picture appears short and wide.</td>
<td>-</td>
</tr>
<tr>
<td>4:3</td>
<td>16:9</td>
<td>4:3 CCO</td>
<td>None</td>
<td>Conversion is not possible. Picture appears short and wide.</td>
<td>-</td>
</tr>
<tr>
<td>4:3</td>
<td>16:9</td>
<td>4:3 P/B</td>
<td>4:3 P/B</td>
<td>4:3 picture is centered in a pillar-style box.</td>
<td><img src="image" alt="4:3 P/B" /></td>
</tr>
<tr>
<td>4:3</td>
<td>16:9</td>
<td>14:9</td>
<td>14:9</td>
<td>Compromises some up-sampling. Some black bars and cropping are visible.</td>
<td><img src="image" alt="14:9" /></td>
</tr>
<tr>
<td>4:3</td>
<td>16:9</td>
<td>16:9 SCALE</td>
<td>16:9 SCALE</td>
<td>Vertically up-samples the center of the 4:3 picture and crops the top and bottom of the screen.</td>
<td><img src="image" alt="16:9 SCALE" /></td>
</tr>
<tr>
<td>Stream</td>
<td>Standard Definition Aspect Ratio or TV A/R</td>
<td>Standard Ratio Conversion or Convert</td>
<td>Aspect Ratio or Act Conv</td>
<td>Description</td>
<td>Image</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------</td>
<td>------------------------------------</td>
<td>-------------------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>16:9</td>
<td>16:9</td>
<td>None</td>
<td>None</td>
<td>Normal</td>
<td><img src="image" alt="16:9" /></td>
</tr>
<tr>
<td>16:9</td>
<td>16:9</td>
<td>Auto</td>
<td>None</td>
<td>No conversion. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>16:9</td>
<td>16:9</td>
<td>16:9 L/B</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>16:9</td>
<td>16:9</td>
<td>4:3 CCO</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>16:9</td>
<td>16:9</td>
<td>4:3 P/B</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>16:9</td>
<td>16:9</td>
<td>14:9</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>16:9</td>
<td>16:9</td>
<td>16:9 SCALE</td>
<td>None</td>
<td>Conversion is not possible. Normal picture.</td>
<td>-</td>
</tr>
<tr>
<td>16:9</td>
<td>4:3</td>
<td>None</td>
<td>None</td>
<td>Picture appears tall and thin.</td>
<td><img src="image" alt="16:9 Compressed" /></td>
</tr>
<tr>
<td>16:9</td>
<td>4:3</td>
<td>16:9 L/B</td>
<td>16:9 L/B</td>
<td>Vertically down-samples the picture and applies black bars at the top and bottom of the screen.</td>
<td><img src="image" alt="4:3 L/B" /></td>
</tr>
<tr>
<td>16:9</td>
<td>4:3</td>
<td>4:3 CCO</td>
<td>4:3 CCO</td>
<td>Horizontally up-samples the center portion of the picture to fill the screen.</td>
<td><img src="image" alt="4:3 Crop" /></td>
</tr>
</tbody>
</table>
Active Format Descriptor (AFD) - normally it is necessary to set both the TV Aspect Ratio and Conversion to correctly display the video program on the TV system. The Auto AFD option enables the receiver output to automatically match the display format of the video program to the TV system based on specific (uplink) program information carried in the transport stream. In this case, the receiver performs the conversion based on the TV Aspect Ratio setting combined with the program-specific uplink information to provide the “best fit” for display of the program material on the TV. This feature is primarily used in 16:9 and 14:9 (wide screen) applications.

### Viewing the Video Status

The current video settings, including the encoding, bit rate, FPS, and aspect ratio of the incoming signal are displayed on the Video Decoding page of the web GUI (Audio & Video > Video Decoding) and the Status > Services > Video menu of the front panel.

The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.

The following table describes the video status information displayed.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Video Output</td>
<td>—</td>
<td>Indicates the actual output video format.</td>
</tr>
<tr>
<td>Standard Definition</td>
<td>—</td>
<td>Displays the actual standard definition format of the primary video output if the PV Output is set to SD.</td>
</tr>
<tr>
<td>Output</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Setting up the Video Closed Caption Information

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspect Ratio</td>
<td>Stream AR and Act Conv</td>
<td>Indicates the aspect ratio of the incoming video stream (4:3 or 16:9), including the actual aspect ratio conversion will perform.</td>
</tr>
<tr>
<td>Wide Screen Signalling</td>
<td>—</td>
<td>Indicates the current output value of PAL WSS in VBI line 23 (4:3 F/F, 16:9 L/B CEN, 16:9 L/B TOP, 16:9 L/B, 14:9 L/B CEN, 14:9 L/B TOP, 14:9 F/F CEN, 16:9 F/F, or UNDEFINED). Note F/F is full format, and L/B is letter box.</td>
</tr>
<tr>
<td>Video Input Format</td>
<td>Video</td>
<td>Indicates the video encoding, format, and resolution of the received program (MPEG1, MPEG2, or H264 format with a resolution of: SD480i/2997, SD480i/3000, SD576i/2500, HD720p/5000, HD720p/5994, HD720p/6000, HD1080i/2500, HD1080i/2997, HD1080i/3000, UHD, Unknown or Unsupported).</td>
</tr>
<tr>
<td>Encoding Format</td>
<td>—</td>
<td>The input stream type of the received signal/program.</td>
</tr>
<tr>
<td>Bit Rate (Mbps)</td>
<td>Rate (Mbps)</td>
<td>Indicates the bit rate of the received video stream, in Mbps.</td>
</tr>
<tr>
<td>Frame Rate (fps)</td>
<td>FPS</td>
<td>Indicates the frame rate of the input video stream (25.0, 29.97, 30.0, 50.0, 59.94, 60.0, unknown, or unsupported).</td>
</tr>
<tr>
<td>3:2 Pulldown</td>
<td>3:2 Pulldown</td>
<td>Indicates whether 3:2 pulldown is detected, was recently detected, or not detected in the input video stream (Yes, Recent, or No).</td>
</tr>
</tbody>
</table>

**Setting up the Video Closed Caption Information**

**Step 1**
From the D9800 web GUI, choose **Audio & Video > Video Metadata**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > Captions**.

**Step 2**
From the **Preferred Closed Caption Mode** drop-down list, or the **Preferred Mode** front panel menu, choose the type of closed captioning to use if there are multiple available in a stream (Auto, SA Custom, EIA 708, Type 3, Type 4 SA, DVS 053 Type 4 ATSC, Reserved, DVS 157, or DirectTV Type 3). The default is Auto.

**Note** SA Custom is not supported when telecine video encoding is enabled.

**Step 3**
Apply your changes. The **Status** area of the web GUI and the **Actual Output** front panel menu displays the actual closed caption mode in the output.
Setting up the Video Metadata

Step 1
From the D9800 web GUI, choose **Audio & Video > Video Metadata**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > VBI**.

Step 2
In the **VITS** area, check the **Enable VITS PAL Line 17, 18, 330, and/or 331** check boxes to enable Vertical Interval Test Signal (VITS) on PAL Lines 17, 18, 330, and/or 331.

Alternatively, choose VITS front panel menu and select the **VITS PAL Line 17, 18, 330, and/or 331** menu and choose **Enable** to enable the VITS on PAL Lines 17, 18, 330 and/or 331.

Step 3
In the **VITC** area, or choose the VITC front panel menu, set the following VANC VITC information:

a) From the **Mode** drop-down list, or the **VITC Mode** front panel menu, choose the Vertical Interval Time Code (VITC) output mode:
   - Passthrough - Passes the VITC on VBI PID unmodified, as received by the receiver.
   - Auto:Create - Generates VITC packets locally.
   - Suppress - Removes the VITC from the VBI PID.
   - Auto:Modify - Replaces the input time code with the locally generated VITC time code.

Step 4
From the **Time code** drop-down list or front panel menu, choose the format of the time code (Linear Time Code [LTC], VITC, or Both).

Step 5
Check the **Drop Frame** check box, or choose Enable or Disable from the **Drop Frame** front panel menu, to correct any deviation that exists between counting the number of frames using the real time and NTSC time. If checked or enabled, it corrects the deviation by omitting the first two frames (00 and 01) from the count at the start of each minute (except for 00, 10, 20, 30, 40, and 50 minutes).

Step 6
In the **VII** area, check the **Enable VII** check box to insert the Vertical Index Information (VII) in the SDI outputs. Or, from the **Setup > Services > SDI > VII > VII** front panel menu, choose Enable or Disable. VII is generated based on the video stream aspect ratio, active format descriptor, standard definition aspect ratio, selected aspect ratio conversion, and standard definition output information. For more information, see **Setting up the Video Information**, on page 85.

Step 7
Apply your changes.

Setting up the Video Subtitles

You can configure the type of subtitling (for example, DVB or Imitext) displayed by the receiver, and how the receiver displays the subtitles on the TV.

Step 1
From the D9800 web GUI, choose **Audio & Video > Subtitles**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > Subtitles**.

Step 2
From the **Subtitle Control** drop-down list (or the **Op Mode** front panel menu), choose the subtitle control to use to display the program subtitles. The following table describes each of the available options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No subtitles are displayed.</td>
</tr>
</tbody>
</table>
Setting up the Video Subtitles

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Displays DVB or Imitext subtitles, if available.</td>
</tr>
<tr>
<td>DVB</td>
<td>Displays only DVB titles, if available. Otherwise, no subtitles are displayed.</td>
</tr>
<tr>
<td>Imitext</td>
<td>Displays only Imitext subtitles, if available. Otherwise, no subtitles are displayed.</td>
</tr>
</tbody>
</table>

**Step 3**
From the **Imitext Position** drop-down list or front panel menu, choose position of the on-screen subtitle text (Standard or Extended).

**Step 4**
The **Imitext Foreground Color**, or the **ForeGnd** front panel menu, sets the color for Imitext subtitles. Auto displays text in the color transmitted by the subtitling equipment. Yellow and White overrides the color set by the uplink and display text in the selected color.

**Step 5**
The **Imitext Background Color**, or the **BackGnd** front panel menu, sets the text background for Imitext subtitles. The table below identifies the affect each setting has on the displayed subtitle text.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>Uses the uplink subtitling equipment setting.</td>
</tr>
<tr>
<td>Shadow</td>
<td>Applies an outline to the right side of each text character. No background box is applied to subtitles. The text is visible directly on top of video.</td>
</tr>
<tr>
<td>Opaque</td>
<td>Applies a black box to each text character.</td>
</tr>
<tr>
<td>Semi</td>
<td>Applies a semi-transparent box to subtitle text.</td>
</tr>
<tr>
<td>None</td>
<td>No shadow or outline is applied to subtitle text.</td>
</tr>
</tbody>
</table>

**Step 6**
In the **Subtitle Language Settings** area, or the **Select Language By** front panel menu, click the radio button of the input source for the subtitle language (or choose the input source for the subtitle language). The default is **Language List**. Language Entry and PMT Order are more applicable for advanced applications. The table below describes each of the available options and how to set them.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language List</td>
<td>Choose the MPEG language to display from the available list.</td>
</tr>
<tr>
<td>Language Entry</td>
<td>Enter the three-character code provided by your uplink service provider (for example, eng for English). The supported languages are according to ISO 639-2 Language Codes.</td>
</tr>
<tr>
<td>PMT Order</td>
<td>Choose the PMT order to display (First to Eighth). This information is available from your uplink provider.</td>
</tr>
</tbody>
</table>

**Step 7**
Apply the changes.
Configuring the HDMI Advanced Settings

By default, the HDMI advanced settings are automatically detected. For troubleshooting purposes, you may need to modify and override existing EDID settings on the connected video monitor through the HDMI connection.

Step 1
From the D9800 web GUI, choose Audio & Video > Video Decoding, and click Advanced in the Video Setup area. Or, from the Main Menu of the D9800 front panel, choose Setup > Services > HDMI > Video.

Step 2
From the Preferred Mode drop-down list, or the Display Pref front panel menu, choose the output mode to use if the video connection fails between the video monitor and the D9800. Choose Auto (default) for the D9800 to choose the mode.

Step 3
In the EDID Settings area, choose the settings that will override the existing EDID settings of the connected video monitor. Or, scroll through the following front panel menus to change the EDID settings: Color Space, Color Depth, Color Range, Matrix Coeff, and EOTF. The EDID settings determine the capability of the video monitor.

Step 4
Check the Force EDID check box, or choose Yes from the EDID front panel menu, to override the EDID settings of the video monitor, even if the video monitor does not support the configured settings. Uncheck the check box, or choose No from the EDID front panel menu, to override the EDID settings of the video monitor if the video monitor supports the configured settings. Otherwise, the default setting is used.

Viewing the HDMI Status

The current HDMI connection is displayed in the HDMI Status area of the Video Decoding page of the web GUI (Audio & Video > Video Decoding), and the Status > Services > HDMI front panel menu.

The Connected status displays whether the D9800 receiver is connected to a TV, using the HDMI connector. The Powered status displays whether there is power on the HDMI connection. The Monitor Name displays the name of the TV. The remaining status parameters display the current EDID settings that are sent to the TV, through the HDMI connection.

Configuring the SDI Outputs

The SDI settings are only available on units with the SDI option installed (D9800-3G-SDI).

Step 1
From the D9800 web GUI, choose Audio & Video > SDI. Or, from the Main Menu of the D9800 front panel, choose Setup > Services > SDI.

Step 2
From the SDI 1 and SDI 2 drop-down lists, choose the type of output for the SDI ports. You can also set these settings on the Video Setup page. For more information, see Setting up the Video Information, on page 85.

Step 3
Click the HD and/or SD tab to configure the VANC services and audio groups for HD and/or SD output.

Step 4
In the SDI VANC Service Setup & Status area, check the Enable check box next to the listed services or outputs to enable the selected outputs in SDI. Or, choose the SDI front panel menu and scroll through the services. The services or outputs are listed in the Service ID menu, and you can enable the outputs from the Enable menu.

a) In the Line Offset field or front panel menu, enter the offset number from the Switch parameter displayed in the status area below or the SDI > Global front panel menu.
b) The following table describes the remaining columns on the web GUI. To view the VANC service statuses on the front panel, choose Status > Services > SDI > VANC Services from the Main Menu.

<table>
<thead>
<tr>
<th>SDI VANC Service Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>Displays whether the service is present and inserted.</td>
</tr>
<tr>
<td>Adj</td>
<td>Displays the line number where the service is expected to be inserted by hardware. If Multiline is supported, the Adj line number is set to Switch + Line Offset. If Multiline is not supported, the Adj value is set to Switch + 2.</td>
</tr>
<tr>
<td>L-F1 and L-F2</td>
<td>Displays on which line of Field 1 and Field 2 the service is inserted.</td>
</tr>
<tr>
<td>Lines</td>
<td>Displays the number of lines per frame used to send data for the service.</td>
</tr>
<tr>
<td>Avg Data</td>
<td>Displays the number of words per frame the service occupies.</td>
</tr>
<tr>
<td>Pkt OK</td>
<td>Displays the number of transmitted data packets per frame for the service.</td>
</tr>
<tr>
<td>Pkt Drop</td>
<td>Displays the number of dropped data packets for the service.</td>
</tr>
</tbody>
</table>

Step 5 An SDI output has four audio groups, with four slots for each group. The SDI audio settings apply to both SDI 1 and SDI 2 outputs. In the SDI Audio Group Setup area, or the Audio Slot front panel menu, set the following:

a) From the Audio Input drop-down menu, or the Audio front panel menu, choose the audio source (PCM Audio 1 to 4 or Compressed Audio 1 to 4) for SDI audio decoding. The Audio Group column, or the Group front panel menu, displays the audio decoder, and the Group Slot column, or the Slot front panel menu, displays the SDI HANC position. If the decoder is mapped to PCM pairs, the Audio Input displays PCM pair options. Choose Off to not connect the SDI audio group to an audio source.

Note Some SD SDI equipment requires transmitting both channel pairs within a group (strict application of the SMPTE272M-2004, section 6.4, recommendation).

b) From the Channel Order drop-down list, choose the audio source channel: Left first, and then right (Left/Right), or right first, and then left (Right/Left).

The SDI front panel menu displays the current SDI port number. It is read-only.

Step 6 Apply the changes.

Viewing the SDI Status

From the D9800 web GUI, choose Audio & Video > SDI. Or, from the Main Menu of the D9800 front panel, choose Status > Services > SDI > Global and scroll through the status menus.

The table below describes the parameters.

<table>
<thead>
<tr>
<th>SDI Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interlaced</td>
<td>Displays whether the video is interlaced.</td>
</tr>
<tr>
<td>Lines</td>
<td>Displays the video resolution (number of lines per frame).</td>
</tr>
</tbody>
</table>
### Setting up SDI Status

<table>
<thead>
<tr>
<th>Description</th>
<th>SDI Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the range of inactive video lines (First to Last) for the current</td>
<td>First, Last, and Switch</td>
</tr>
<tr>
<td>video format. The VANC data is inserted in the video line(s), following</td>
<td></td>
</tr>
<tr>
<td>the Switch line. The numbers are for the top field if it is an interlaced</td>
<td></td>
</tr>
<tr>
<td>video, or for the frame if it is a progressive video.</td>
<td></td>
</tr>
<tr>
<td><strong>Note</strong> The SMPTE standard recommends using lines starting from Switch</td>
<td></td>
</tr>
<tr>
<td>line + 2.</td>
<td></td>
</tr>
<tr>
<td>Displays the number of frames per second.</td>
<td>Frames/Second or Frames</td>
</tr>
<tr>
<td>Displays the number of VANC words per line.</td>
<td>Words</td>
</tr>
<tr>
<td>Displays whether Multiline VANC insertion is supported.</td>
<td>Multiline</td>
</tr>
</tbody>
</table>

### Setting up Audio Decoding

The SDI outputs support the following audio formats: MPEG LA (MPEG-1 and MPEG-2), Dolby Digital, MPEG-2 AAC, MPEG-4 HE-AAC (up to v2.0, both LOAS/LATM and ADTS packaging, implicit and explicit signaling), and Dolby Digital Plus.

#### Step 1
From the D9800 web GUI, choose **Audio & Video > Audio Decoding**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > Audio**.

#### Step 2
From the Channel drop-down list, choose the channel for audio decoding. The selected channel also updates the video decoding channel.

#### Step 3
The **Audio Selection** area allows you to select the audio PID for audio decoding. The D9800 supports four local audio devices.

- **a)** The **Audio Decode** column displays the to balanced audio output you can configure, or from the Aud# front panel menu, choose the balanced audio output on the rear panel to configure.

  **Note** The AUD 3&4 outputs are only available on units with the SDI option installed (D9800-3G-SDI).

- **b)** From the **Select By** drop-down list, or the **Select Language By** front panel menu, choose the input source for Audio 1, 2, 3, or 4 (PMT Order, Language List, or Language Entry). This is required if the monitored program contains more than two audio PIDs.

  **Note** The input source for Audio 1 must match the input source for Audio 2, 3, and 4. For example, you cannot choose PMT Order for Audio 1, and then Language List for Audio 2.

If **Language List** is selected, choose a language from the **Language List** column, or choose the **Language List** front panel menu. If Language Entry is selected, you must enter a language code (for example, eng for English) in the Manual Entry column (or choose Entry from the front panel menu). If the languages selected are different, the first PID with the matching language will play on the appropriate audio device (Audio 1 or Audio 2). If you select the same language for both Audio 1 and Audio 2, the PIDs are mapped as follows: the first matching language PID to Audio 1 and the second matching PID to Audio 2. The supported languages are according to ISO 639-2 Language Codes.

If **PMT Order** is selected, choose the PMT source for the audio channel from the **PMT Source** column, or the **PMT Scr** front panel menu (None, AUD1 to AUD64). You cannot select the same PID for both audio devices. If you select **Diagnosis**...
the same instance of an audio PID for one of the audio devices, the other audio device PID instance will automatically increment by one. For example, Audio 1 is set to AUD1 and Audio 2 is set to AUD2. If you change Audio 1 source to AUD2, the Audio 2 source will automatically change to AUD3 to resolve the conflict.

c) From the ST302 Stream Select drop-down list, or the Stream Select front panel menu, choose the number of ST302 audio streams you want to decode (1 to 4).

Note This is not supported in the current release.

Step 4 The Audio Setup area allows you to configure the four balanced audio outputs on the rear panel (Audio 1&2 and Audio 3&4), known in the web GUI as 1, 2, 3, and 4, respectively.

Note Audio 3&4, Digital Out Preference, and DD+ Output options are only available if the unit has the SDI option installed (D9800-3G-SDI). For more information on the Digital Out Preference and DD+, see Setting the AES-3 Out Preference, on page 97.

a) From the Audio Mode drop-down list, or the Stereo/Mono front panel menu, choose the audio mode, which sets the output mixing. Choose Stereo (Left and Right are passed directly through to Left and Right), R-Mono (Right is passed to both the Left and Right), L-MONO (Left is passed to both the Left and Right), or Mixed (Left is passed to both the Left and Right, and Right is passed to both the Left and Right).

The table below displays the stereo and mono mixing and the output channel configuration:

<table>
<thead>
<tr>
<th>Stereo/Mono Mixing</th>
<th>Output Channel Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Left</td>
</tr>
<tr>
<td>Stereo</td>
<td>Ch1</td>
</tr>
<tr>
<td>Left Mono</td>
<td>Ch1</td>
</tr>
<tr>
<td>Right Mono</td>
<td>Ch2</td>
</tr>
<tr>
<td>Mixed</td>
<td>Ch1 + Ch2</td>
</tr>
</tbody>
</table>

b) From the AC3 Compression drop-down list or front panel menu, choose the mode to use if the output is compressed Dolby Digital audio. The selections are Line Mode, Custom 1, Custom 0, or RF Mode. RF Mode is recommended for analog cable modulators.

The table below displays the settings used for the available Dolby Digital compression modes:

<table>
<thead>
<tr>
<th>Dolby Digital Compression Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Mode</td>
</tr>
<tr>
<td>Dialogue Normalization</td>
</tr>
<tr>
<td>Gain Shift</td>
</tr>
<tr>
<td>Dynamic Range Control (DRC)</td>
</tr>
</tbody>
</table>
Dolby Digital Compression Mode

<table>
<thead>
<tr>
<th>RF Mode</th>
<th>Line Mode</th>
<th>Custom 0</th>
<th>Custom 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compression Scaling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cut or Boost</td>
<td>Disabled, full compressed</td>
<td>Enabled</td>
<td>Enabled</td>
</tr>
<tr>
<td>(defines a scale factor from 1.0 to 0.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

c) From the **Left Attenuation** drop-down list, or the **Left (dB)** front panel menu, choose the volume adjustment for the Left audio channel. You can select a value in the range from -6.0 dB to +6.0 dB, in increments of 0.5 dB. For the front panel, any value can be entered with the numeric keypad, and the Up and Down arrow buttons increase or decrease by 0.5 dB.

d) From the **Right Attenuation** drop-down list, or the **Right (dB)** front panel menu, is the volume adjustment for the Right audio channel. You can select a value in the range from -6.0 dB to +6.0 dB, in increments of 0.5 dB. For the front panel, any value can be entered with the numeric keypad, and the Up and Down arrow buttons increase or decrease by 0.5 dB.

e) The **AES-3 Out Preference** and the **Dolby Digital Plus** options only appear on units with the SDI option installed (D9800-3G-SDI). For more information, see Section 97.

**Step 5** Apply the changes.

## Setting the AES-3 Out Preference

The AES-3 Out Preference and the Dolby Digital Plus options only appear on units with the SDI option installed (D9800-3G-SDI).

**Step 1** From the D9800 web GUI, choose **Audio & Video > Audio Decoding**, and refer to the Audio Setup area. Or, from the Main Menu of the front panel, choose **Setup > Services > Audio**.

**Step 2** The Audio Decode column displays the to balanced audio output you can configure, or from the **Aud#** front panel menu, choose the balanced audio output on the rear panel to configure.

**Step 3** From the **AES-3 Out Preference** drop-down list, or the **AES-3 Out Pref** front panel menu, choose one of the following output preference for the SDI or AES-3id output:

- **PCM Samples** - If the audio source is MPEG Layer II format, the output will be routed to the SDI output as PCM.
- **Compressed** - If the audio source is AES compressed, the output will routed to the AES-3id output, compressed.

**Note** Audio decode 3 and 4 are not supported.

If the AES-3 Out Preference is set to PCM Samples, the output is PCM regardless of whether it is MPEG, Dolby Digital (AC-3), or AAC audio. Additionally, when the output is Compressed, MPEG-1 L1 and L2 will output PCM, even though Dolby Digital (AC-3) and AAC are compressed (and transcoded).
### Configuring the Advanced Audio Channel Settings

By default, the four incoming audio PIDs are directly mapped to the SDI audio decoder outputs. The advanced mode allows you to configure HDMI and map the audio PIDs to PCM pairs, instead of the audio decoders.

#### Step 1
From the D9800 web GUI, choose Audio & Video > Audio Decoding, and click Advanced in the Audio Selection area. Or, from the Main Menu of the D9800 front panel, choose Setup > Services > HDMI > Advanced Audio.

#### Step 2
Check the **Enable Advanced Settings** check box to enable and configure PCM pairs for the incoming audio. Or, from the **Enabled** front panel menu, choose Yes.

#### Step 3
For each of the PCM pairs, choose the audio decoder (1 to 4) from the Audio Decoder drop-down list. Or, choose the **Settings** front panel menu and choose the pair, slot, and audio decoder from the **Pair**, **Slot**, and **Decoder** front panel menu. The left and right slots for each PCM pair must be set to the same audio decoder number. Choose Off to not connect the PCM pair to a decoder.
Step 4  From the Channel drop-down list or front panel menu, choose the slot for the audio decode for each PCM pair (Downmix Left or Downmix Right). The channel must be different for the left and right slots of each PCM pair. For example, if you choose Downmix Right for PCM pair 1, slot left, you must choose Downmix Left for PCM pair 1, slot right.

Step 5  Click OK.

Step 6  Set the HDMI audio pairs by setting the PCM pairs for each SDI audio group. For more information, see Configuring the SDI Outputs, on page 93.

---

**Viewing the Audio Status**

From the D9800 web GUI, choose Audio & Video > Audio Decoding. Or, from the Main Menu of the D9800 front panel, choose Status > Services > Audio.

### Note

The bit rate information displayed is for monitoring purposes only, and is not always accurate. We recommend that you use a test or measurement device that is designed for high accuracy to obtain accurate bit rate information.

The table below describes the audio status information.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio</td>
<td>AUD#</td>
<td>Displays the current audio decoder status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• AUD1 for audio channel Aud1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• AUD2 for audio channel Aud2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• AUD1 to AUD4 for two stereo audio channels.</td>
</tr>
<tr>
<td>PID</td>
<td>—</td>
<td>Indicates the program PID number (1 to 8191).</td>
</tr>
<tr>
<td>Language</td>
<td>—</td>
<td>Indicates the language code.</td>
</tr>
<tr>
<td>Format</td>
<td>Format</td>
<td>Indicates the format of the audio input stream (None, Sine, Pink, Beep, MPEG1L1, MPEG1L2, MPEG2L1, MPEG2L2, AC3, LOAS AAC, ADTS AAC, LOAS HEAAC, ADTS HEAAC, DDP, or ST302).</td>
</tr>
<tr>
<td>Bit Rate (kbps)</td>
<td>BR(kbps)</td>
<td>Displays the bit rate of the audio input stream, in kbps.</td>
</tr>
<tr>
<td>SFR</td>
<td>SFR(KHz)</td>
<td>Displays the sample rate of the input audio stream, in kHz (32, 44.1, or 48 KHz).</td>
</tr>
<tr>
<td>Buffer</td>
<td>Buffer</td>
<td>Indicates the buffer level of the input audio stream, in bytes.</td>
</tr>
<tr>
<td>Bits per Sample</td>
<td>Bits Per Sample</td>
<td>Displays the number of bits per audio sample (16, 20, 24, or Unknown).</td>
</tr>
</tbody>
</table>
Viewing the Advanced Audio Status

From the D9800 web GUI, choose Audio & Video > Audio Decoding, and then click Advanced Audio Status in the Audio Status area. Or, from the Main Menu of the D9800 front panel, choose Status > Services > Audio.

The table below describes the advanced audio status information.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dualmono Mode</td>
<td>DUAL-MONO IND</td>
<td>Indicates the presence of dual mono audio outputs in the audio stream (ON or OFF). If the dual mono indicator is set to ON, the left and right outputs will correspond to mono channel 1 and mono channel 2 respectively.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Viewing the Advanced Audio Status

From the D9800 web GUI, choose Audio & Video > Audio Decoding, and then click Advanced Audio Status in the Audio Status area. Or, from the Main Menu of the D9800 front panel, choose Status > Services > Audio.

The table below describes the advanced audio status information.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>ST302#</td>
<td>Indicates the ST302 audio instance number.</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td>This is not supported in the current release.</td>
</tr>
<tr>
<td>Number of Streams</td>
<td>Streams</td>
<td>Displays the number of ST302 streams found in the audio transport stream.</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td>This is not supported in the current release.</td>
</tr>
<tr>
<td>—</td>
<td>Format</td>
<td>Indicates the format of the ST302 stream (Unknown or Dolby E).</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td>This is not supported in the current release.</td>
</tr>
<tr>
<td>Packet Size</td>
<td>Packet Size</td>
<td>Indicates the SMPTE AES3 payload packet size, in bytes, exclusive of SMPTE ST302 header. This is same as the audio_packet_size field, defined in the SMPTE ST302M specification. The packet size depends on the data word size (16, 20, or 24 bits per word), and the associated video frame rate.</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td>This is not supported in the current release.</td>
</tr>
</tbody>
</table>
Indicates how the programs are packed into the Dolby E frame (for more information, refer to SMPTE RDD 6). It defines the number of separate programs in the DolbyE frame, and the number of separate channels in each program.

**Note** This is not supported in the current release.

<table>
<thead>
<tr>
<th>Web GUI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolby-E Program Config</td>
<td>Dolby-E Config</td>
<td>Indicates how the programs are packed into the Dolby E frame (for more information, refer to SMPTE RDD 6). It defines the number of separate programs in the DolbyE frame, and the number of separate channels in each program.</td>
</tr>
<tr>
<td>Audio</td>
<td>AUD</td>
<td>Displays the audio decode output (1 to 4).</td>
</tr>
<tr>
<td>DDP Mode</td>
<td>DDP IND</td>
<td>Displays the presence of Dolby Digital Plus frames within a Dolby Digital audio stream (ON or OFF).</td>
</tr>
</tbody>
</table>

**Viewing Audio PIDs**

**Step 1** From the D9800 web GUI, choose **Audio & Video > Audio Decoding**.

**Step 2** Click **List Audio PIDs**. The table below describes the audio PIDs information.

<table>
<thead>
<tr>
<th>Audio PIDs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Displays the input audio source (AUD1 or AUD2).</td>
</tr>
<tr>
<td>Detail</td>
<td>Indicates any detail associated with the audio PID.</td>
</tr>
<tr>
<td>Language</td>
<td>Displays the language code of the audio PID, if applicable.</td>
</tr>
<tr>
<td>PID</td>
<td>Indicates the audio PID number, in the range from 1 to 8192.</td>
</tr>
<tr>
<td>Present</td>
<td>Indicates whether the audio PID is present in the incoming stream (Yes or No).</td>
</tr>
</tbody>
</table>
Viewing Audio PIDs
CHAPTER 7

Configuring the Output Information

This section describes how to set up cueing parameters and decoding services for the D9800 Network Transport Receiver.

Note
The cueing parameters and decode enables setup are available on the single-stream units only.

- Setting up Cueing Parameters, on page 103
- Testing Cue Tones, on page 104
- Setting up the Cue Tone Sequences, on page 105
- Setting up Services to be Decoded by the Receiver, on page 105

Setting up Cueing Parameters

Note
This is available on single-stream units only.

Step 1
From the D9800 web GUI, choose Audio & Video > Cueing. Or, from the Main Menu of the D9800 front panel, choose Setup > Outputs > Cueing.

Step 2
From the Cueing Mode drop-down list or front panel menu, choose whether cueing output should be DTMF tones or trigger pins.

Tones are standard Dual-Tone Multi-Frequency (DTMF) tones. The tones are generated at the Cue Tone/Relay output on the rear panel of the receiver. If the Cueing Mode is set to Tone, configure the following:

a) In the Cueing Tone Repeat Count field, or the Repeat front panel menu, set the number of consecutive tone sequences to be generated. Values greater than 1 are provided when a scenario demands repetition to ensure that the ad insertion equipment receives the signal. You can enter 1, 2, or 3. The default is 3.

b) In the Tone Duration field, or the Tone (ms) front panel menu, choose the duration of each tone, in milliseconds, in the range from 0 to 80. The default is 40.

c) In the Silence Duration field, or the Silence (ms) front panel menu, enter the duration of each silence between tones, in milliseconds. The duration is in the range from 0 to 80. The default is 40.
Trigger refers to open-collector pins which can be generated at the Cue Tone/Relay output on the rear panel of the receiver. If the Cueing Mode is set to Trigger, configure the following:

a) From the **Trigger Polarity** drop-down list or front panel menu, choose the pin polarity. Choose High for the pins to act as open or floating collectors on an active cueing signal and as ground on an inactive signal. Choose Low for the pins to act as ground on an active cueing signal and as open or floating collectors on an inactive signal.

b) From the **Relay Trigger Bit** drop-down list, or the **Cue Trigger Bit** front panel menu, choose the cue trigger bit/pin that will activate the relay.

**Step 3**

From the **Relay Mode** drop-down list or front panel menu, choose the relay mode that can be programmed to respond to an Alarm state, Warning state, or the state of one of the eight cue trigger pins. The response is generated at the Cue Tone/Relay output on the rear panel of the receiver. The table below shows what the possible field settings are and their relationship to the receiver output.

<table>
<thead>
<tr>
<th>Relay Mode</th>
<th>Condition</th>
<th>NC-C</th>
<th>C-NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm</td>
<td>Unit Power Off</td>
<td>Open</td>
<td>Close</td>
</tr>
<tr>
<td></td>
<td>Alarm State</td>
<td>Open</td>
<td>Close</td>
</tr>
<tr>
<td></td>
<td>No Alarm</td>
<td>Close</td>
<td>Open</td>
</tr>
<tr>
<td>Trigger</td>
<td>Active (selected in PNC)</td>
<td>Close</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Inactive</td>
<td>Open</td>
<td>Close</td>
</tr>
</tbody>
</table>

**Step 4**

Apply the changes.

---

### Testing Cue Tones

*Note* This is available on single-stream units only.

**Step 1**

From the D9800 web GUI, choose **Audio & Video > Cue Tone Test**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Outputs > Cueing**.

**Step 2**

In the **Test Tones** field, or the **Cue Tone Test** front panel menu, specify the three digit tone sequence (000 to 999).

**Step 3**

From the **Sequence Mode** drop-down list, or the **Mode** front panel menu, choose the tone sequence mode. The table below displays the available options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Start tone only.</td>
</tr>
<tr>
<td>#</td>
<td>End tone only.</td>
</tr>
<tr>
<td>*/#</td>
<td>Start and end tones. The end tone is signaled after waiting the time specified in Delay(sec).</td>
</tr>
</tbody>
</table>
Step 4 Apply the changes or choose Run Test from the front panel menu.

### Setting up the Cue Tone Sequences

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>From the D9800 web GUI, choose Audio &amp; Video &gt; Cue Tone. Or, from the Main Menu of the D9800 front panel, choose Setup &gt; Outputs &gt; Cueing.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>The Sequence Number column on the web GUI lists the tone sequences you can configure, or choose the Seq# front panel menu and then choose the tone sequence to configure (1 to 16).</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>From the Sequence State drop-down list, or the State front panel menu, choose whether the current tone sequence is enabled or disabled. When disabled, there is no cue tone in the output.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>In the Sequence Tones field, or the Tones front panel menu, set the three digit tone sequence (1 to 999).</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>From the Sequence Mode drop-down list, or the Mode front panel menu, choose the tone sequence mode. For information on the mode options, see Step 3 in Testing Cue Tones, on page 104.</td>
</tr>
<tr>
<td><strong>Step 6</strong></td>
<td>If the Sequence Mode is set to */# (Start/Stop), set the delay, in seconds, between the start and stop sequences in the Sequence Delay field, or the Delay (sec) front panel menu. You can enter a value in the range from 1 to 255. The default is 30.</td>
</tr>
<tr>
<td><strong>Step 7</strong></td>
<td>Apply the changes.</td>
</tr>
</tbody>
</table>

### Setting up Services to be Decoded by the Receiver

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>From the D9800 web GUI, choose Audio &amp; Video &gt; Decode Enables. Or, from the Main Menu of the D9800 front panel, choose Setup &gt; Services &gt; Decode.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Check the check boxes of services you want decoded by the receiver. Check or uncheck the Enable Decode Engine check box to enable or disable all the services in the list. Or, scroll through the list of services, press Select and choose Yes or No in the Enabled menu to choose the services you want decoded by the receiver. By default, all the decode services are enabled.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Apply your changes.</td>
</tr>
</tbody>
</table>
Configuring the Output Information

Setting up Services to be Decoded by the Receiver
CHAPTER 8

Configuring the Transport Stream Information

This section describes how to set up and configure the transport stream outputs in the D9800 Network Transport Receiver.

- Transport Stream Outputs, on page 107
- Configuring the ASI or MPEGoIP Output General Settings, on page 109
- Configuring the ASI or MPEGoIP Output Mode, on page 110
- Configuring the MPE Settings, on page 112
- Setting Up Redundancy Controls for MPEG over IP and MPE Outputs, on page 113
- Synchronizing the Output Services, on page 114
- Resolving Conflicts, on page 117
- Setting up the DPM Program Entries, on page 118
- Copying between ASI and MPEGoIP DPM Settings, on page 121
- Configuring the Program Entries, on page 122
- Setting the SAP IP Address, on page 124
- Setting the Transport Packet Limits, on page 125
- Configuring the Forward Error Correction Settings, on page 126
- Configuring MPEG over IP or IP Data Streams, on page 128
- Configuring the Transcoder Settings, on page 129

Transport Stream Outputs

The ASI and MPEGoIP transport outputs are individually configurable and provide the capability of carrying a decrypted program for digital tier distribution. This helps the compressed video programs are efficiently distributed to households equipped with digital set-top boxes. Digital Program Insertion (DPI) information will also be available along with the video and audio PIDs (Packet Identifiers) for external ad insertion in compressed digital format.

DVB-ASI Output

The D9800 receiver has one DVB-ASI output. This output can be used as an input for a DVB-T transmitter or other types of DVB-ASI reception equipment.
**MPEGoIP Output**

The MPEGoIP output provides a number of output modes including the capability of carrying a decrypted program for digital tier distribution. This helps ensure that compressed video programs are efficiently distributed to households equipped with digital set-top boxes. Digital Program Insertion (DPI) information will also be available along with the video and audio PIDs (Packet Identifiers) for external ad-insertion in compressed digital format.

The diagram below shows an example of the D9800 receiver used in an MPEGoIP application.

---

**MPE Output**

The Multiprotocol Encapsulation (MPE) output provides a means to carry packet oriented IP protocols on top of a transport stream. The MPE output receives IP packets from the transport stream and the IP data can be sent through an Ethernet switch to an IP router or directly to a receiving device.

The diagram below shows an example of the D9800 receiver used in an MPE application.

---

**SDI Outputs**

*Note*

The SDI outputs are available on single-stream units only.
The D9800 receiver is designed for satellite content distribution applications requiring DVB-S and DVB-S2 reception capabilities with advanced digital outputs for digital tier program distribution. A built-in decoder is capable of decoding an MPEG-2 or MPEG-4 High Definition (HD) program for analog monitoring. A high-quality SDI output version is available for re-encoding applications.

The diagram below shows an example of the D9800 receiver used in SDI monitoring applications.

---

### Configuring the ASI or MPEGoIP Output General Settings

**Step 1**
Do one of the following:

- **Web GUI (single-stream unit):** From the D9800 web GUI, choose **Transport Stream > ASI Output** or **MPEG over IP**.
- **Front Panel (single-stream unit):** From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > ASI or MOIP**.
- **Web GUI (multi-stream unit):** From the D9800 web GUI, choose **Transport Stream > ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output**.
- **Front Panel (multi-stream unit):** From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > ASI or IP**, and choose the input you want to configure from the **ASI or IP** front panel menu.

**Step 2**
The **Rate Control** drop-down list is set to User, as the method used to calculate the output rate. The output rate is specified by the **User Rate** field or front panel menu. It is determined by the user setting regardless of the input source.

**Step 3**
In the **User Rate** field or front panel menu, choose the maximum output bit rate expected by the equipment connected to the ASI or MPEGoIP output (0 to 206 Mbps).

**Note** The output data may be lost if this bit rate is set to a value less than the actual bit rate.

**Step 4**
From the **Descrambled** drop-down list, or the **Descramble Mode** front panel menu, choose whether to descramble the output if the input is descrambled. The following describes the available options:

- **Scrambled** - The output channel remains scrambled, even if the PE is authorized and can descramble the channel.
- **Descrambled (default)** - Descrambles the output channel, and passes in-the-clear channels.

**Step 5**
For ASI output, choose Yes or No from the **Null Packet Insertion** drop-down list, or the **Insert Null Packet** front panel menu to determine whether to insert null packets into the output to maintain output at a constant bit rate. Null packets are always inserted if the configured output bit rate is higher than the payload rate of the transport stream to be encapsulated.

For MPEGoIP output or IP Data output, the **Null Packet Insertion** drop-down list, or the **Insert Null Packet** front panel menu is set to Yes.

**Step 6**
Apply your changes.
Configuring the ASI or MPEGIP Output Mode

Step 1: Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > ASI Output or MPEG over IP Output.
- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > ASI or MOIP.
- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > ASI or IP, and choose the input you want to configure general settings from the ASI or IP front panel menu.

Step 2: From the Output Mode drop-down list or front panel menu, choose the DPM output mode for the current output. With the exception of No Output, choosing a mode will configure the DPM settings to achieve the specified behavior. In this way, they act as DPM presets. We highly recommend that you use either one of the basic modes (Passthrough or Service Channels Only), or, for advanced setup, enter the DPM mapping before setting the output mode.

Each PE in the Single Program Transport Stream (SPTS) creates its own transport stream, which includes PAT, CAT, SDT, and PMT tables for one service channel only, as well as ES PIDs for the PE.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Output</td>
<td>No ASI, MPEGIP, or IP output will be generated and the ASI or DATA ports will be disabled.</td>
</tr>
<tr>
<td>Passthrough</td>
<td>All PEs will be set to Pass and other DPM settings will also be set.</td>
</tr>
<tr>
<td>Service Channels Only</td>
<td>This is similar to Passthrough, except that only channels applied to program entries are available on the output.</td>
</tr>
<tr>
<td>MAP Passthrough</td>
<td>The output will be identical to the input, except that channels assigned to PEs and PIDs will be mapped using the DPM settings. If the input is tuned to a valid channel, the PEs are automatically set to Map. Otherwise, the PEs are automatically set to Drop. When choosing MAP Passthrough, a message appears to confirm that you want to resynchronize the output changes and PIDs to match the selected input programs. Click or choose Yes to set the DPM mapping to the last valid (or saved) configuration. Click or choose No to use the existing DPM maps. Note If the PE is mapped, it uses the last saved output MAP configuration. The output map (for example, output channel PMT) does not change automatically if the input or channel number is changed.</td>
</tr>
<tr>
<td>MAP Service Channels Only</td>
<td>This is similar to MAP Passthrough, except that only channels applied to program entries are available on the output. If the input is tuned to a valid channel, the PEs are automatically set to Map. Otherwise, the PEs are automatically set to Drop. When choosing MAP Service Channels Only, a message appears to confirm that you want to resynchronize the output changes and PIDs to match the selected input programs. Click or choose Yes to set the DPM mapping to the last valid (or saved) configuration. Click or choose No to use the existing DPM maps.</td>
</tr>
</tbody>
</table>
If the PE is mapped, it uses the last valid input. The output map (for example, output channel PMT) does not change automatically if the input or channel number is changed.

**Note**

If the PE is transcoded, it uses the last valid input. The output map (for example, output channel PMT) does not change automatically if the input or channel number is changed.

### Transcoding (multi-stream units only)

The output will be generated using the DPM MAP settings, except that the DPM **Action** will be set to XCode and the **Descrambled** mode will be set to Descrambled. If the input is tuned to a valid channel, the PEs are automatically set to XCode. Otherwise, the PEs are automatically set to Drop.

**Note**

If the PE is transcoded, it uses the last valid input. The output map (for example, output channel PMT) does not change automatically if the input or channel number is changed.

### SPTS Service Channels Only
(MPEG over IP only)

The service channel is passed with the same channel number, PMT PIDs, and ES PIDs.

### SPTS MAP Service Channels Only (MPEG over IP only)

The service channel is mapped to the preconfigured channel number, PMT PIDs, and ES PIDs.

### SPTS Transcoding (multi-stream units only)

The service channel is mapped to the preconfigured channel number, PMT PIDs, and ES PIDs. The PEs are automatically set to XCode.

You are prompted to Resync All for the selected output. This resynchronizes the inputs to outputs for the current PMT according to the service assignments and the PIDs for the PE.

The **Mode Status** field, or the **Config Type** front panel menu, indicates the current DPM configuration change by a user after changing the Output Mode. The following table lists the statuses:

<table>
<thead>
<tr>
<th>Mode Status or Config Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmodified</td>
<td>No changes were made after setting a new output mode. In a multi-stream unit, this applies to single input mode only. For more information on single input mode, see Assigning a Channel to a Program Entry, on page 74. In a multi input mode, <strong>Unmodified (MS Mode)</strong> status is displayed.</td>
</tr>
<tr>
<td>Edited by User</td>
<td>DPM changes were made by the user after setting the Output Mode. In a multi-stream unit, this applies to a single input mode only. For more information on the single input mode, see Assigning a Channel to a Program Entry, on page 74. In a multi input mode, <strong>Edited by User (MS Mode)</strong> status is displayed.</td>
</tr>
</tbody>
</table>
### Mode Status or Config Type | Description
---|---
Auto Re-Mapped | The output map changed automatically to fix the output channel or PID conflicts at the time of setup. In a multi-stream unit, this applies to a single input mode only. For more information on the single input mode, see Assigning a Channel to a Program Entry, on page 74. In a multi input mode, **Auto re-mapped (MS Mode)** status is displayed.

Chg by Uplink | DPM output changes were made, based on the uplink request after setting the Output Mode. In a multi-stream unit, this applies to a single input mode only. For more information on the single input mode, see Assigning a Channel to a Program Entry, on page 74. In a multi input mode, **Chg by Uplink (MS Mode)** status is displayed.

Auto-Adjusted | This is for multi-stream units only. It indicates that the Auto-Adjusted (MS Mode) status has not changed, but input mode has changed from a multi input mode to a single input mode. For more information on single input and multi input modes, see Assigning a Channel to a Program Entry, on page 74.

Auto-Adjusted (MS Mode) | This is for multi-stream units only. DPM changes were made automatically when switching from single input mode to multi input mode. For more information on the DPM changes, see Assigning a Channel to a Program Entry, on page 74.

---

**Step 3**  
Apply your changes.  
If the changes cannot be saved, a message is displayed indicating “Bad configuration data”.

**Note**  
When remapping an input program channel to an output channel, ensure that the PIDs are mapped to different PIDs to avoid PID collisions.

---

**Configuring the MPE Settings**

**Note**  
The MPE data output is only available on single-stream units with MPEGoIP Input/Output option installed (D9800-SS-MPEGOIP).
**Step 1**  From the D9800 web GUI, choose System Settings > MPE. Or, from the Main Menu of the D9800 front panel, choose Setup > IP > Protocols.

**Step 2**  From the MPE Data Filter Mode drop-down list or the MPE front panel menu, choose whether the MPE data is forwarded to the network.

- Forward None - Do not forward MPE data to the network.
- Forward All - Forward all the MPE data to the network.
- Forward Filtered - Only forward the MPE data from the defined Static Multicast Filter table below to the network.

**Note**  The receiver supports up to a maximum of 10 Mbps throughput when forward 1500 byte packets.

If MPE Data Filter Mode is set to Forward Filtered, do the following to add a static multicast filter address in the Static Multicast Filtering area:

1. Click the + icon to add a row.

2. In the Multicast Filter Addresses field, enter the IP address that sets the destination for multicast MPE data, in the range from 224.0.0.0 to 239.0.0.0.

3. Click Save.

**Step 3**  Apply the changes.

---

**What to do next**

To edit or delete an existing multicast filter address, click the radio button of the address entry and click edit (刀) to edit the entry, or click delete (刀) to remove the entry.

---

**Setting Up Redundancy Controls for MPEG over IP and MPE Outputs**

The Redundancy Control area allows you to configure redundancy for MPEG over IP or IP Data, and MPE outputs when an active port fails due to a physical connectivity loss. The DATA1 and DATA2 connectors, and DATA3 and DATA4 connectors (multi-stream units only) on the rear panel are used as redundant port pairs.

**Step 1**  Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > MPEG over IP Output, or choose System Settings > MPE.


- Front Panel: From the Main Menu of the D9800 front panel, choose Setup > IP > Redundancy.
Step 2  Refer to the Redundancy Control area.

Step 3  From the Mode drop-down list or front panel menu, choose one of the following:

- Manual: First Port or Manual: Second Port - For single-stream units, the setting only uses DATA 1 or DATA 2 port for output data. If you are configuring redundancy for IP Data 3/Data 4 Output on a multi-stream unit, First Port is the DATA 3 port, and Second Port is the DATA 4 port. The remaining redundancy controls below are not applicable.

- Backup: First Port or Backup: Second Port - Use DATA 1 or DATA 2 port as the primary data port and if a physical connectivity loss occurs, it will failover to the backup port. The backup port is the port that is not used as a primary port in a port pair. For example, if Data 1 is the primary port, the backup port is Data 2. If you are configuring redundancy for IP Data 3/Data 4 Output on a multi-stream unit, First Port is the DATA 3 port, and Second Port is the DATA 4 port. See Step 4 to configure specific settings for this mode.

- Mirroring - Send the same data to both DATA 1 and DATA 2 ports, or DATA 3 and DATA 4 ports. The remaining redundancy controls below are not applicable.

Step 4  If Backup: First Port or Backup: Second Port is set as the Mode, choose one of the following from the Direction drop-down list or front panel menu:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revertive</td>
<td>Attempt to revert back to the primary port when using the backup port and the primary port is active again. Set the following parameters:</td>
</tr>
<tr>
<td></td>
<td>• Delay Forward - Set the time to switch the data port after the system detects a failure, in a range from 0 to 10000 milliseconds.</td>
</tr>
<tr>
<td></td>
<td>• Delay Back - Set the time to wait when reverting back to the primary port once the primary link is active again, in a range from 1 to 120 seconds.</td>
</tr>
<tr>
<td>Non-Revertive</td>
<td>If the system detects a link loss, the primary port will failover to the backup port (if active). If the backup port is active and it detects a link loss, and the primary link is active, it will attempt to switch back to the primary port. Set the following parameter:</td>
</tr>
<tr>
<td></td>
<td>• Delay Forward - Set the time to switch the data port after the system detects a failure, in a range from 0 to 10000 milliseconds.</td>
</tr>
</tbody>
</table>

Step 5  Apply the changes.

You can view the latest redundancy status changes in the Redundancy Status area. The Ports In Use column displays the current output port in use, the Change Reason column displays a description of the reason for the last redundancy status change (Link or Setup+Link), and the Change Date & Time column displays the last date and time the redundancy status changed.

Synchronizing the Output Services

There are two methods for resynchronizing the program entry output with its input: resynchronize or resynchronize all. The resynchronize option allows you to customize the synchronization. The resynchronize all option synchronizes all the DPM output with the PMT data for all the program entries on the selected output.
**Step 1**  
Do one of the following:  
• Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > Digital Program Mapping for ASI or MPEG over IP.  
• Front Panel: From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > DPM.

**Step 2**  
In the DPM Program Entry Setup area, do one of the following:  
• Click Resynchronize All all the DPM output with the PMT data for all the program entries on the selected output. Or, select the Global front panel menu and choose the output.  
• Click the radio button of the program entry you want to synchronize and then click Resynchronize to synchronize each PE output to its input according to one of the four output modes listed below. Or, select the ASI, MOIP, or IP front panel menu, choose the program entry you want to synchronize from the PE Resync menu, and then choose one of the four options below.

<table>
<thead>
<tr>
<th>Web GUI option</th>
<th>Front Panel option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resynchronize Program, PMT PID, ES List &amp; ES PIDs</td>
<td>All</td>
<td>The receiver synchronizes the PE output according to the services and then the PID assigned to each service.</td>
</tr>
<tr>
<td>Resynchronize ES List</td>
<td>Svcs</td>
<td>The receiver synchronizes the PE output according to the available input services only, and ignore the input to output service PID mapping. This is useful when you already have PID assignments set for the services, but want to ensure that the services are mapped correctly.</td>
</tr>
<tr>
<td>Resynchronize ES PIDs</td>
<td>PIDs</td>
<td>The receiver synchronizes the PE output according to the input PIDs only, and ignore the service assignment categories/names. This is useful when you already have the services set up, but want to synchronize to the incoming PIDs.</td>
</tr>
<tr>
<td>Resynchronize Template ES List &amp; PIDs</td>
<td>Template</td>
<td>Allows you to preset the input to output mapping of a PE according to the preset template. This is helpful in pre-configuring any number of PEs for future use.</td>
</tr>
</tbody>
</table>

If a conflict occurs, a message that the conflicts will be fixed automatically and to preview the changes prior to saving is displayed. For more information, see Resolving Conflicts, on page 117.
Setting up the Auto Synchronization Options

The ASI, MoIP, IP Data 1/Data 2 Auto Sync area or the Auto Map front panel menu allows you to configure the DPM without editing each output channel and PID separately.

**Step 1**
Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > ASI Output or MPEG over IP Output and refer to the Auto Sync area.
- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > ASI or MOIP.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose Transport Stream > ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output and refer to the Auto Sync area.
- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > ASI1, ASI2, IP1/2, or IP 3/4.

**Step 2**
From the Enable Auto Fix for Collision drop-down list, or the Auto Map front panel menu, choose Yes for the DPM to resolve channel and PID collisions automatically on the transport outputs. New values are assigned to the parameters that caused the conflict. The new assigned values are not used by any incoming transport or other PE outputs. If a collision is detected, you can review the new changes and click Apply to accept the new changes.

Choose No and a detailed list of all the conflicts is displayed in the Output Channel and PID Conflicts table (click View Conflicts) when a conflict occurs. You can then resolve the conflicts manually. For information on resolving conflicts, see Resolving Conflicts, on page 117. The Enable Auto Map for Auxiliary PE is automatically set to No.

**Step 3**
From the Enable Auto Map For Auxiliary PEs drop-down list, choose Yes for the DPM to set the output actions for all the Auxiliary PEs to MAP when the Output Mode is set to Transcode. The Enable Auto Fix for Collision is automatically set to Yes. If the Enable Fixed Table Output is set to Yes, the output configuration for the auxiliary PEs is determined by the fixed output table options when you resynchronize the output channels and PIDs to match the input programs. The DPM resolves any output conflicts automatically, even if the Enable Auto Fix for Collision is set to No.

This setting is for multi-stream units only.

**Step 4**
Apply your changes.

---

### Setting up the Resynchronize All Option

**Step 1**
Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > ASI Output or MPEG over IP Output, and refer to the Auto Sync area.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose Transport Stream > ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output, and refer to the Auto Sync area.
- Front Panel: From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > Options, and choose the input you want to configure from the Output front panel menu.

**Step 2**
From the Enable Fixed Output drop-down list, or the Fixed Output front panel menu, choose Yes for the DPM to assign new values for all the output channels and PIDs according to the fixed output options defined, when you synchronize the inputs to the outputs according to the service assignments only (Resynchronize All).
Step 3  Click Fixed Output Option, or scroll the front panel menus to configure the fixed output options and click OK.

a) From the Use Input Channel Numbers drop-down list, or the Use Imp Chan front panel menu, choose Yes to use the output channel. Otherwise, choose No (default) to use the first or start channel and channel offset or step assigned below.

   • In the First Channel Number field, or the Start front panel menu, set the first PE channel number to use (from 1 to 65535). By default, the channel is set to 1.

   • In the Channel Numbers Offset field, or the Step front panel menu, set the subsequent PE channel numbers (from 1 to 65535). For example, if the First Channel Number is set to 100 and the Channel Numbers Offset is set to 10, then the first channel number is 100, and the second channel number is 110.

b) From the Use Input PMT PID Numbers drop-down list, or the Use Inp PMT front panel menu, choose Yes to use the input PMT PID number. Otherwise, choose No (default) to use the first or start PE PID number and PID offset or step number assigned below.

   • In the First Channel First ES PID Number field (or the Start front panel menu), enter the first PE PMT PID number (from 1 to 8192). The default is 1701.

   • In the PMT PID Numbers Offset field, or the Step front panel menu, set the offset of the subsequent PE PMT PID numbers (from 1 to 8192). For example, if the First Channel First ES PID Number is set to 1701 and the PMT PID Numbers Offset is set to 1, then the first PMT PID number is 1701, and the second PMT PID number is 1702.

c) From the Use Input ES PID Numbers drop-down list, or the Use Inp PIDs front panel menu, choose Yes to use the input ES PID number. Otherwise, choose No (default) to use the first or start ES PID number and the ES PID offset or step number assigned below.

   • In the First Channel First ES PID Number field, or the Start front panel menu, set the first ES PID number. The default is 101.

   • In the First ES PID Numbers Offset field, set the offset of the first ES PID of subsequent channel numbers. For example, if the First ES PID Number is set to 101 and the ES PID Numbers Offset is set to 100, then the first ES PID number is 101, and the second ES PID number is 201.

d) From the Use Input PMT ES Stream Order drop-down list, or the Use Inp Ord front panel menu, choose Yes to assign the ES PID according to the incoming PMT order. Otherwise, set to No to use the reserved PIDs defined below.

   • In the PCR, VID, AUD, SUBT, VBI, DPI, MPE, TTX, DATA, LSD, CDT, ETV fields or front panel menus, set the number of PIDs for the specified streams (PCR, VID, AUD, SUBT, VBI, DPI, MPE, TTX, DATA, LSD, CDT, ETV) in one channel (from 1 to 64).

Step 4  Apply your changes.

Resolving Conflicts  If a conflict occurs and the Enable Auto Map for Collision field, or the Auto Map front panel menu, is set to No, a detailed list of all the conflicts is displayed in the Output Channel and PID Conflicts table when you click View Conflicts. You can then resolve the conflicts manually.
If a conflict occurs and the **Enable Auto Map for Collision** field (or the Auto Map front panel menu) is set to Yes, a message that the conflicts will be fixed automatically and the Output Channel and PID Conflicts table is empty when you click **View Conflicts**.

Note

Any changes made to the ASI DPM values will automatically change the **Mode Status** to **Edited by User**.

- For channel conflicts, the system will only automatically change the duplicated output channel numbers. If both PE actions are set to Map, the output channel number of the higher PE is changed. Otherwise, the output channel number of the mapped PE is changed. The new channel number selected is the next channel number that does not appear in the current PAT or belong to any other PEs.

- For PID conflicts, the system will only automatically change the duplicated output PID numbers. If both PE actions are set to Map, the output PID number of the higher PE is changed. Otherwise, the output PID number of the mapped PE is changed. For example, if the PMT PID of PE1 matches the ES PID of PE2, the ES PID of PE2 is changed. The new PID number selected is the next number that does not appear in the output of any PE and it is not in the current transport input.

Setting up the DPM Program Entries

The DPM feature allows you to groom functionality on a program basis, where individual service PID modifications are provided on a limited scale. Use the digital program mapping feature to:

- configure the transport output bit rate.
- configure the output mode for a program entry.
- configure the service and PID output settings in a program entry.

This section defines all the available fields. For an example of a typical setup of the DPM, see Typical Digital Program Mapping Setup, on page 120.

Configuring DPM General Settings

**Step 1**

Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI or MPEG over IP output, and refer to the **DPM General Settings** area.
- Front Panel (single-stream unit): From the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI** or **MOIP**.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output, and refer to the **DPM General Settings** area.
- Front Panel (multi-stream unit): from the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI1**, **ASI2**, **IP1/2**, or **IP3/4**.

**Step 2**

From the **Remapping Mode** drop-down list, or the **Map Mode** front panel menu, choose the DPM mapping mode for this output.
• Svc ID - The elementary PIDs are not changed. Channels are remapped by changing their PSI references. When this mode is selected, PE detailed PID mapping in the PD menu are ignored.
• Svc ID & PID - Channels and the elementary service PIDs can be mapped in the DPM PE PID MAP window.

If you use this mode, you must choose how to handle duplicate programs from the Duplicated Method drop-down list, or the Duplicated Mode front panel menu:

• PSI Remap - Every input PID can be mapped to only one output PID. If PID mapping conflicts exist, DPM will use the Precedence Rule to decide which output PID to use. All PMTs using the input PID will be updated to reference the output PID specified by the winner.
• Pkt Copy - An input PID can be mapped to multiple output PIDs. The PID will be duplicated as many times as needed (up to a certain hardware limitation). Pkt Copy is recommended for most applications.

Note: This may increase the output bandwidth of the stream.

Step 3
From the Unreferenced Content drop-down list, or the Unref front panel menu, choose the action to use for unreferenced content. Unreferenced content is the remainder of the transport stream that is not filtered by the program entries. Choose Drop (default) to drop all unreferenced content. Choose Pass to pass all unreferenced content to the output unchanged. For multi-stream units only, choose Mode-i to use a customer-specific mode. Click Mode-i Options, or choose PAT/PMT Offset and NIT Offset front panel menus, to set the PAT Offset and NIT Plus Offset information. This is only used if directed by Cisco. For more information, contact Cisco Services.

Note: Mode-i is not supported in multi input mode. If you switch to multi input mode by adding a second active input, the unreferenced content will drop.

Step 4
From the Service ID Output drop-down list, or the Service ID front panel menu, choose whether the transcoder should always generate PSI tables for the Mapped PE even if the selected input channel is not available, or for only valid service channels/IDs. The following describes each service ID:

• Valid Ch - Only transmits the PSI tables for the mapped program if the program exists on the input stream.
• All Ch - Transmits the PSI tables for the mapped program even if the program does not exist in the input stream.

All Ch is only valid if the PAT, NIT, SDT and PMT are set to Regenerate.

Step 5
Apply the changes.

---

**Setting the PSI Table Options**

**Step 1**
Do one of the following:

• Web GUI (single-stream only): From the D9800 web GUI, choose Transport Stream > Digital Program Mapping for ASI, MPEG over IP output, and refer to the DPM General Settings area.
• Front Panel (single-stream only): From the D9800 front panel, choose Setup > Outputs > TS Out > DPM > ASI or MOIP.
• Web GUI (multi-stream only): From the D9800 web GUI, choose Transport Stream > Digital Program Mapping for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output, and refer to the DPM General Settings area.
• Front Panel (multi-stream only): From the D9800 front panel, choose Setup > Outputs > TS Out > DPM > ASII, ASI2, IP1/2, or IP3/4.
Step 2  
From the **PSI Table Output Option** drop-down list, or the **PSI Options** front panel menu, choose the action to perform on the PSI tables for the output stream. The following describes each option:

- **Pass All** - Transmits the incoming PSI tables as is; does not modify the content and rate. The SI Regeneration Option (or the PSI Rate front panel menu) and table settings are ignored.
- **Drop All** - Does not transmit any PSI tables. The SI Regeneration Option and table settings are ignored.
- **Ctl By Table** - The incoming PSI tables are transmitted, according to the output mode set in the table options (see Step b below). You must set the following:
  1. From the **SI Regeneration Option** drop-down list, or the **PSI Rate** front panel menu, choose the regeneration rate for the PSI tables being regenerated. The following describes each PSI rate:
     - **Auto** - Matches the generated PSI tables' output rate to the incoming rate.
     - **MPEG Min** - Transmits the generated PSI tables on the longest intervals that are allowed by MPEG standard.
     - **SA Std** - Transmits the generated PSI tables based on PowerVu standard intervals.
  2. Click **Table Options**, or scroll down the front panel menu to choose the table specific output mode for each table. From each of the table drop-down lists, choose pass, drop, regenerate (Regen), or pass with rate control (PwRC) and click **OK**.

**Note**  
For the front panel, the table menus (PAT, CAT, PMT, TSDT, NIT, NITO, SDT, SDTO, BAT EIT, TDT, RST, TOT, DIT, SIT, EMC, EMM, DRT, CDT) will only appear if you choose **Ctl by Table**.

**Note**  
The CDT is different from the other tables listed because the CDT is referred to within the PMT, rather than outside the PMT. Check the **Block CDT Output** check box (or choose Pass from the **CDT** front panel menu) to override the DPM PID map configuration for CDT PIDs and to always drop all CDTs. Otherwise, uncheck the **Block CDT Output** (or choose Drop from the **CDT** front panel menu) to permit the output of CDTs following the configured DPM PID map configuration and all other DPM constraints.

Step 3  
From the **PSI Regeneration Option** drop-down list, or the **Setup > Outputs > TS Out > DPM > Global > Regenerate** front panel menu, choose whether to regenerate the PSI tables in the output. Choose **Always** to regenerate all the tables or choose **As Needed** to only regenerate the tables if the content has changed.

Step 4  
Apply the changes.

---

**Typical Digital Program Mapping Setup**

**Step 1**  
Verify that you are receiving a valid signal and that you have set up the channels that you want to pass, drop, or map.

**Step 2**  
Set the following output parameters:

- **Output Mode** - Map Service Channels Only.
- **Descrambled** - Scrambled or descrambled for downstream viewing or monitoring.

For more information, see Configuring the ASI or MPEGoIP Output General Settings, on page 109.

**Step 3**  
From the ASI, MPEG over IP, or IP Digital Program Mapping page:

- Click **Resynchronize All** or choose the **Resync All** from the Global front panel menu.
- Edit a program entry in the **DPM Program Entry Setup** area and add a new record.
For more information, see Synchronizing the Output Services, on page 114 and Mapping the Program PIDs, on page 123.

**Step 4**
Set the following DPM general settings:
- Remapping Mode or Map Mode - Svc ID & PID
- Duplication Method or Duplic Mode - Pkt Copy
- Unreferenced Content or Unref - Drop
- Service ID Output or Svc ID - Valid Ch or All Ch
- PSI Output Option or PSI Options - Ctrl By Table
- PSI Regeneration Option or PSI Rate - Always or As Needed

For more information, see Configuring DPM General Settings, on page 118.

**Step 5**
Set the following table options:
- PAT, CAT, PMT, SDT - Regen
- TSDT, NITO, SDTO, BAT, EIT, ECM, EMM, DRT, CDT - Drop
- TDT, RST, TOT, DIT, SIT - Pass
- NIT - Regen or Drop

For more information, see Setting the PSI Table Options, on page 119.

**Step 6**
Apply the changes.

---

### Copying between ASI and MPEGoIP DPM Settings

**Step 1**
Do one of the following:
- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI or MPEG over IP output.
- Front Panel: From the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > Global**.

**Step 2**
For a single-stream unit, do one of the following:
- Click **Copy To MOIP**, or choose the **Copy: > ASI->MOIP** front panel menu, to copy all the DPM data from the ASI output to the MOIP output.
- Click **Copy To ASI**, or choose the **MOIP->ASI** front panel menu, to copy all the DPM data from the MOIP output to the ASI output.

For a multi-stream unit, do one of the following:
- Web GUI: Click **Copy** and check the output check boxes to copy all the DPM data from the output displayed in the **From** field, to the outputs selected in the **To** field. Click **Apply**.
Configuring the Program Entries

Step 1
Do one of the following:

• Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > Digital Program Mapping for ASI or MPEGoIP.
• Front Panel (single-stream unit): From the D9800 front panel, choose Setup > Outputs > TS Out > DPM > ASI or MOIP
• Front Panel (multi-stream unit): From the D9800 front panel, choose Setup > Outputs > TS Out > DPM > ASI1, ASI2, IP1/2, or IP3/4.

The DPM Program Entry Setup area displays a list of DPM program entries in the Program Entry column, or the PE menu. There are 16 channels for single-stream units, and 32 channels for multi-stream units. Each program entry displays the input channel number in the Chl # column, or the InCh front panel menu, and the channel name in the Name column.

On a multi-stream unit, depending on the number of transcoder boards installed, the unit can have up to 16 auxiliary channels (PE1A to PE16A). For example, if there is one transcoder board, there are 8 auxiliary channels, and if there are two transcoder boards, there are 16 auxiliary channels. For more information on viewing the number of transcoder boards installed, see the number of D9800-TXB entries listed in the HW Board Versions area (System Settings > System).

The auxiliary channels automatically tune to the corresponding PE channels. If the main PE is not transcoding, the auxiliary PE is dropped.

Step 2
Click the program entry you want to edit, or choose the program entry from the PE front panel menu.

Step 3
On a multi-stream unit, choose the input you want to assign to the program entry from the Input Name drop-down list. On a single-stream unit, the Input Name column displays the input used (RF, ASI, or MOIP). You can also set this on the Channel Selection page. For more information, see Assigning a Channel to a Program Entry, on page 74.

Step 4
From the Channel drop-down list, choose or enter the channel number of the current program entry. You can also set this on the Channel Selection page. For more information, see Assigning a Channel to a Program Entry, on page 74. The channel is displayed in the InCh front panel menu.

Step 5
From the Action column, or the Act front panel menu, choose the action to perform on the current program entry. This setting controls the overall DPM behavior of the program entry and affects how the PID mapping operates.

• Pass (default) - The output channel is the same as the input channel. The Output Chl # and PMT PID settings (OutCh and PMT front panel menus) are ignored. All PID map entries are ignored except for entries that explicitly drop a service.
• Map - The output channel is mapped to the Output Chl # and PMT PID (OutCh and PMT front panel menu) settings. Only services which have entries in the PID map are available on the output. These services will appear in the PMT even if the stream is not present. To edit the channel number and PMT PID that will be mapped to the input channel or PMT PID, click the radio button of the program entry and click Edit. For more information, see Mapping the Program PIDs, on page 123. If the PE is mapped, it uses the last valid input. The output map (for example, output channel PMT) does not change automatically if the input or channel number is changed.
• Drop - The current channel is not sent to the output and its PMT is removed from the output. The OutCh, PMT, and PID map entries are ignored.
• XCode (multi-stream units only) - Provides the flexibility to define all the outgoing PID numbers for a PE, including those not currently on transmission, as in Map mode, plus the video PID is transcoded to output at the rate and settings defined for the transcoding channel. The Auxiliary Programs (P1A to P16A) cannot be set to XCode. Also, they are automatically dropped when the corresponding Main PE is not transcoding.

Step 6  Click **Save** or press **Apply** on the front panel.

---

### Configuring Auxiliary Program Entries

You can only configure auxiliary program entries on a multi-stream unit.

**Step 1**  Ensure that the **Enable Auto Map For Auxiliary PEs** drop-down list is set to Yes. For more information, see Setting up the Auto Synchronization Options, on page 116.

**Step 2**  From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1, ASI 2, IP Data 1/Data 2, or IP Data 3/Data 4. Or, from the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI1, ASI2, IP1/2, or IP3/4**.

**Step 3**  Click a PxA to edit or choose a PxA from the PE front panel menu.

**Step 4**  Choose Map from the **Action** drop-down list, or the **Act** front panel menu. For more information on the Action parameter, see Configuring the Program Entries, on page 122.

**Step 5**  Save your changes.

**Step 6**  Click **Resynchronize All** or choose **Resync: All** front panel menu to ensure that the inputs and outputs are the same.

---

### Mapping the Program PIDs

The PID mapping feature allows you to map input services to output PIDs. If the PE Action is Pass, or the PE Action is Map and the Remapping Mode is set to Svc ID, only entries which drop a service are applied and all other services are passed through. If the PE action is Map and Map Mode is Svc ID & PID, all entries are applied. Any services not mapped by an entry will be dropped.

For the front panel, press up and down to scroll through the PID map entries. Press ADV to insert or delete entries from the PID map. After inserting an entry, specify the service using OutType and In, and set the desired Action. If the action is Map, select the output PID value as well. Then press APPLY and save the settings to see the selected input service that will follow that mapping.

**Step 1**  Do one of the following:

- **Web GUI (single-stream unit):** From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI or MPEG over IP output.
- **Front Panel (single-stream unit):** From the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI** or **MOIP**.
- **Web GUI (multi-stream unit):** From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output.
• Front Panel (single-stream unit): from the D9800 front panel, choose Setup > Outputs > TS Out > DPM > ASI1, ASI2, IP1/2, or IP3/4.

Step 2  Click the program entry radio button you want to map the PIDs and click Edit or choose the program entry from the PE front panel menu.

Step 3  In the Output Channel # field, or the OutCh front panel menu, enter the output channel number you want to map to the input channel (displayed in the Input Channel # field or the InCh front panel menu). This value is only used if the PE Action is set to Map. You can enter a range from 1 to 65535.

Step 4  In the Output PMT PID field, or the second PMT front panel menu, enter the output PMT PID number you want to map to the input PMT PID (displayed in the Input PMT PID field or the first PMT front panel menu). This value is only used if the PE Action is set to Map. You can enter a range from 2 to 8190.

Step 5  For front panel only, choose the PID menu to map the program PIDs.

Step 6  You can click on the radio button of an existing PID mapping entry you want to modify or click the + button to insert a new PID mapping. If there is no record available on the front panel, choose Yes to insert a new record.

The Input Stream, or the ITyp front panel menu, indicates the input service that will be mapped by the current entry. The Input PID, or the PID front panel menu, displays the input PID (1 to 8190) that will be mapped by the current entry. This is only used if Action is set to Map.

Step 7  From the Action drop-down list, or the Act front panel menu, choose the action to perform on the current PID. The Drop action is always performed, but the Map option is only applied if the PE Action is Map and the Remapping Mode is Svc ID & PID in the DPM General Settings section.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop</td>
<td>The service selected by the Category and Instance will be mapped to the specified PID. This is only applied if the PE action is Map and the Remapping Mode is Svc ID &amp; PID.</td>
</tr>
<tr>
<td>Map</td>
<td>The service selected by the Category and Instance will be removed from the PMT and the output stream.</td>
</tr>
</tbody>
</table>

Step 8  If the Action, or the Act front panel menu, is set to Map, enter the output PID number (0 to 8192) in the Output PID field, or the PID front panel menu.

Step 9  In the Stream Type field, or the StTyp front panel menu, enter a stream type to map within a PE to a specified PID (0 to 255).

Step 10 From the Category drop-down list, or the OTyp front panel menu, choose the service to configure. If an input service matches this type and Instance, then the Action will be applied. This value is only used if Action is set to Map.

Step 11 From the Instance field, or the In front panel menu, enter the instance of the service specified by Category to configure (1 to 64). If an input service matches this type and instance, then the Action will be applied.

Step 12 Click Save, and then click OK.

Step 13 Apply the changes.

---

Setting the SAP IP Address

Step 1  Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > MPEG over IP Output.
• Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > MOIP > MOIP Streams.
• Web GUI (multi-stream unit): From the D9800 web GUI, choose Transport Stream > IP Data 1/Data 2 Output or Data 3/Data 4 Output.
• Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > IP > Streams Configuration.

**Step 2**
In the SAP Multicast IP Address field, or the SAP Address front panel menu, set the Session Announcement Protocol (SAP) destination IP address. This is the IP address where the SAP announcements are sent, if required.

*Note* We recommend that you do not change the default IP address (224.2.127.254).

**Step 3**
In the SAP Destination UDP Port field or SAP Port front panel menu, set the SAP destination port number (1 to 65534). This is the UDP port where the SAP announcements are sent, if required.

*Note* We recommend that you do not change the default SAP port of 9875.

**Step 4**
Apply the changes.

The front panel has the following additional settings:

• Send SAP - Select whether to send Session Announcement Protocol messages (None or RFC2327).
• SAP ID - Choose the SAP output stream name source (User String or SDT Channel).
• SAP User Str - Enter the SAP user string, up to 31 characters.

---

### Setting the Transport Packet Limits

**Step 1**
Do one of the following:

• Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > MPEG over IP Output.
• Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > MOIP > MOIP Streams.
• Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > IP > Streams Configuration.

**Step 2**
In the Maximum Transport Packets/Ethernet Frame field, or the TS/IP front panel menu, enter or choose the maximum number of transport packets per IP packet (1 to 7).

**Step 3**
In the Minimum number Packets/Second field, or the Min IP/s front panel menu, enter or choose the minimum number of transport packets per IP packet (0 or 2 to 1000).
Configuring the Forward Error Correction Settings

Due to the nature of an IP network (occasionally packet loss, packet reordering, and/or stream jitter) it is not the perfect channel for transmitting broadcast-quality compressed video content. Forward Error Correction (FEC) developed by the Pro-MPEG forum is a unique technology to enhance the robustness of video traffic over IP networks. The D9800 receiver supports Pro-MPEG FEC Code of Practice (COP) #3 release2 and SMPTE-2022, which is based on the exclusive or (XOR) boolean operator applied to a number of data packets. When a FEC packet is created by performing the XOR boolean operation on a number of RTP packets, a missing RTP packet can always be reconstructed by performing the XOR operation on the FEC packet and the remaining RTP packets.

- FEC = RTP1 XOR RTP2
- RTP1 = FEC XOR RTP2
- RTP2 = FEC XOR RTP1

Step 1
Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > MPEG over IP Output > Stream tab.
- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > MOIP > MOIP Streams.
- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > IP > Streams Configuration.

Step 2
Click the radio button of the stream you want to configure FEC settings, or choose the ID front panel menu and choose the stream.

Step 3
Click FEC.

Step 4
From the FEC Mode drop-down list, or the FEC front panel menu, choose an error protection profile.

- Choose 1D to use the 1D FEC profile. The 1D FEC profile maps the RTP packet stream across columns (matrix of data packets). The following is an example:
• Choose **2D** to use the 2D FEC profile. The 2D FEC profile maps the RTP packet stream across both the column packets and row packets. In the following example, a FEC packet is created for each row and each column:

• Choose **None** to disable the error protection for the MPEGoIP stream.

**Step 5**

The generation of the FEC packets is based on the use of a matrix. The matrix size is defined by the Length (L) and Depth (D) parameters. In the **FEC Columns (L)** field or front panel menu, set the spacing between non-consecutive packets used to calculate the FEC packet (1 to 20).

If the FEC Mode or the FEC front panel menu is set to 2D, set the depth of the matrix in the FEC Rows (D) field or front panel menu (4 to 20).

If the **FEC Mode** or the **FEC** front panel menu is set to 2D, set the depth of the matrix in the **FEC Rows (D)** field or front panel menu (4 to 20).
For additional restrictions on L and D values (depending on the FEC Scheme and FEC Mode), refer to Pro-MPEG FEC COP#3 and SMPTE-2022.

**Step 6** In the **FEC Columns UDP Port** field, or the **FEC1 UDP** front panel menu, enter the UDP port number for the FEC Columns stream (2 to 65534, even number only). We recommend that you set the port number to TS UDP port + 2.

If the FEC Mode or the FEC front panel menu is set to 2D, enter the destination UDP port number for the FEC Rows stream in the FEC Rows UDP Port field (or the FEC2 UDP front panel menu). The range is from 2 to 65534, even number only. We recommend that you set the port number to TS UDP port + 4.

**Step 7** Click **OK** and apply the changes.

---

**Configuring MPEG over IP or IP Data Streams**

**Step 1** Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > MPEG over IP Output > Stream** tab.
- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > MOIP > MOIP Streams**.
- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > IP > Streams Configuration**.

**Step 2** Double-click the stream you want to edit, or from the **ID** front panel menu, choose the stream you want to edit. A single-stream unit has up to 16 streams, and a multi-stream unit has up to 32 streams.

If the **Output Mode** is set to No Output, Passthrough, Service Channels Only, MAP Passthrough, MAP Service Channels Only, or Transcoding, you can configure the Multi Program Transport Stream (MPTS). PE2 to PE16 or PE32 are not applicable.

If the **Output Mode** is set to SPTS Service Channels Only, SPTS MAP Service Channels Only, or SPTS Transcoding, you can configure PE1 to PE16 or PE32 streams. Each PE creates its own transport stream for the assigned service channel and ES PIDs.

**Step 3** From the **Bitrate** field, or the **User Rate** front panel menu, enter the output rate of the transport stream, in Mbps.

**Step 4** From the **Encapsulation** drop-down list, or the **MOIP** front panel menu, choose the transport protocol to use for the output stream (UDP or RTP).

**Step 5** In the **Destination IP** field, or the **DestAddr** front panel menu, enter the unicast (valid host IP only) or multicast destination IP address.

**Step 6** In the **Destination UDP Port** field, or the **UDPPort** front panel menu, choose the destination port number (1024 to 65534).

**Step 7** Apply the changes.
Configuring Advanced MPEG over IP or IP Data Stream Settings

Step 1  Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose Transport Stream > MPEG over IP Output > Stream tab.
- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > MOIP > MOIP Streams.
- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > IP > Stream Configuration.

Step 2  Click the radio button of the stream you want to configure advanced settings and click Advanced, or from the ID front panel menu, choose the stream you want to edit. A single-stream unit has up to 16 streams, and a multi-stream unit has up to 32 streams.

Step 3  In the Traffic Class field, or the TOS front panel menu, enter the quality of service (0 to 255).

Step 4  In the Time to Live (Max #hops) field, or the TTL front panel menu, enter the hop limit of the packet's lifespan (0 to 255).

Step 5  In the Source UDP Port field, or the SrcPort front panel menu, enter the source UDP port number (0 to 65535).

Note  Set the Source UDP Port to 0 to use the default UDP port (49162).

Step 6  From the Announce Type drop-down list, or the Send SAP front panel menu, choose RFC 2327 to send the Session Announcement Protocol (SAP) messages according to the RFC 2327 standard. Otherwise, choose None to not send SAP messages.

Step 7  From the Announce Title Source drop-down list, or the SAP ID front panel menu, choose User String to use the SAP string as the channel name, defined in the Announce User's Title below. Otherwise, choose SDT Channel to use the SDT string as the channel name.

Step 8  In the Announce User's Title field, or the SAP User Str front panel menu, enter the SAP identifier or string (up to 31 characters), if the Announce Title Source or SAP ID front panel is set to User String.

Step 9  Apply the changes.

Configuring the Transcoder Settings

The Transcoder Setup page is available on multi-stream units only. The transcode feature, with the appropriate licenses, allows you to convert MPEG-4 HD services to MPEG-2, for use in CATV headends. The HEVC processor feature, with the appropriate license, allows you to convert HEVC or H.265 services to MPEG-2. For more information on licenses, see Viewing Hardware Features and Software License Information, on page 34.

Step 1  From the D9800 web GUI, choose Transport Stream > Transcoder Setup. Or, from the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > Transcode > Transcode.

Step 2  From the Action on Loss of Input drop-down list, or the LO1 Action front panel menu, choose the action the transcoder takes when there is a loss of input signal (No Output or Black Output).
### Step 3

From **Transcoder 1 Output** to **Transcoder 16 Output** drop-down lists, choose the video format of the transcoded output. The number of transcoder outputs depends on the transcoding licenses available. Or, from the PE front panel menu, choose the transcoder index, as referenced by the DPM, and then choose the video format of the transcoded output from the **Video Mode** front panel menu. The table below describes the options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>The input video format and resolution remains unchanged during transcoding. For example, if the input video format is SD, the output video format is also SD.</td>
</tr>
<tr>
<td>SD Output</td>
<td>The video down-converts from HD to SD when an HD input signal is received. The SD horizontal resolution will follow the SD HRes parameter set in transcoder settings. For more information on transcoder settings, see Configuring the HD and SD Transcode Settings, on page 131.</td>
</tr>
<tr>
<td>HD Output</td>
<td>The input video up-converts from SD to HD 1080i when receiving an SD input signal. The HD horizontal resolution will follow the HD HRes parameter, set in transcoder settings. For more information on transcoder settings, see Configuring the HD and SD Transcode Settings, on page 131.</td>
</tr>
</tbody>
</table>

### Step 4

Apply your changes.

The **Remaining HD Transcoders** field displays the remaining HD licenses available to transcode on the unit. The number of resources available is updated automatically when you choose the transcoder output. Choosing Auto or HD Output decreases the HD license count by one.

---

### Setting up Transcoding

This is for multi-stream units only (D9800-MS-MPEGOIP).

#### Step 1
Verify that you are receiving a valid signal and that you have set up the channels that you want to transcode.

#### Step 2
Set the ASI and/or IP Data **Output Mode** to Transcoding. You will be prompted to Resync All for the selected output. This resynchronizes the inputs to outputs for the current PMT according to the service assignments and the PIDs for the program entry. For more information, see Configuring the ASI or MPEGoIP Output Mode, on page 110.

#### Step 3
Save your changes. If the changes cannot be saved, an error message is displayed.

**Note** When remapping an input program channel to an output program channel, ensure that the PIDs are mapped to different PIDs to avoid PID collisions.

#### Step 4
If desired, set a program channel for the second transcoder channel (PE2) and repeat Step 2, depending on the transcoding licenses. For more information on assigning a program channel to a PE, see Assigning a Channel to a Program Entry, on page 74.
Configuring the HD and SD Transcode Settings

Step 1  From the D9800 web GUI, choose Transport Stream > Transcoder Setup. Or, from the Main Menu of the D9800 front panel, choose Setup > Outputs > TS Out > Transcode.

Step 2  Click the Transcoder <#> Output radio button to select the channel you want to configure, and click Transcoder Config. Or, from the PE front panel menu, choose the program entry index, as referenced by the DPM. The <#> indicates the transcoder number (1 to 8 or 1 to 16, depending on the number of transcoders licensed).

Step 3  On the web GUI, if the selected channel is set to HD Output, set the following in the HD Settings column. If the selected channel is set to SD Output, set the following in the SD Settings column.

a)  From the HRes drop-down list, or the HD HRes or SD HRes front panel menu, choose the transcode channel HD or SD horizontal output video resolution. The table below displays the HD settings and resolutions.

<table>
<thead>
<tr>
<th>HD HRes Setting</th>
<th>Input Resolution</th>
<th>Output Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>1080i, 1080p</td>
<td>1920</td>
</tr>
<tr>
<td></td>
<td>720p</td>
<td>1280</td>
</tr>
<tr>
<td>3/4</td>
<td>1080i, 1080p</td>
<td>1440</td>
</tr>
<tr>
<td></td>
<td>720p</td>
<td>960</td>
</tr>
</tbody>
</table>

b)  From the Bitrate Mode drop-down list, or the HD B/R Mode or SD B/R Mode front panel menu, choose the transcode channel output bit rate mode (VBR or CBR).

c)  In the Rate field for HD Settings, or the HD Bitrate front panel menu, enter the transcode output bit rate when HD MPEG-4, AVC, or HEVC to HD MPEG-2 transcoding is selected. The range is from 8 to 25 Mb/s, in 400 b/s increments.

In the Rate field for SD Settings, or the SD Bitrate front panel menu, enter the transcode output bit rate when HD to SD transcoding is selected as the output channel (2 to 15 Mb/s, in 400 b/s increments).

d)  From the GOP Control drop-down list, or the HD GOP Control or SD GOP Control front panel menu, choose the format when transcoding a Group Of Pictures (GOP). The options are User GOP(MN) or I Frame Sync.

If User GOP is set as the GOP Control, choose the transcode manual GOP format value from the User GOP drop-down list, or the HD User GOP (M N) or SD User GOP (MN) front panel menu. The transcoder attempts to reuse information from the encoded bit stream to improve the video quality of the transcoded stream. Amongst others, if the incoming GOP structure is similar to that of an MPEG-2, it will reuse the frame allocations from the incoming stream as long as GOP Control is set to I Frame Sync. If the downstream transcoder does not support altering GOP structures, set the GOP Control setting to User GOP (MN). This will also require the setting of the GOP structure which is given as two numbers, where the first is the length of the GOP and the second is the number of B-pictures per sub-GOP. The supported GOP structures are 1 0, 12 2, 15 2, 24 2, and 30 2.

e)  From the 3:2 Pull Down drop-down list, or the HD 3:2 Pulldown or SD 3:2 Pulldown front panel menu, choose to enable or disable the 3:2 pulldown.

Step 4  If you are configuring SD settings, the following are additional parameters, specific to SD only:

a)  From the Output Aspect Ratio drop-down list, or the SD Aspect Ratio front panel menu, choose the aspect ratio for the SD transcode output channel. The options are 4:3 and 16:9 (wide aspect ratio).

b)  From the Aspect Ratio Conversion drop-down list, or the SD AR Conv front panel menu, choose the SD transcode channel aspect ratio conversion. This is the conversion that the transcoder will perform on the output signal for the
picture to be displayed correctly (for example, to correspond to the aspect ratio of your TV) on your TV, based on your selection.

c) From the Closed Caption Packet 1 and Closed Caption Packet 2 drop-down lists, or the CC Pkt 1 and CC Pkt 2 front panel menus, choose the order to output the closed caption packets on the transcoded SD output.

Step 5 Click OK.

---

### Inserting Subtitles to Transcoded Video

**Step 1** From the D9800 web GUI, choose **Transport Stream > Transcoder Setup**.

**Step 2** Click the radio button of the channel you want to insert subtitles to transcoded video (Transcoder 1, 2, 3, 4, 5, 6, 7, or 8 Output), and click **Subtitle Burn-In**.

**Step 3** From the **Subtitle Control** drop-down list, choose the control to use to display the program subtitles. The table below describes the available options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No subtitles are displayed.</td>
</tr>
<tr>
<td>On</td>
<td>Displays DVB or Imitext subtitles, if available.</td>
</tr>
<tr>
<td>DVB</td>
<td>Displays only DVB subtitles, if available.</td>
</tr>
<tr>
<td>Imitext</td>
<td>Displays only Imitext subtitles, if available.</td>
</tr>
</tbody>
</table>

**Step 4** From the **Select By** drop-down list, choose the input source for the subtitle language. The default is Language List. Language Entry and PMT Order are more applicable for advanced applications.

- If Language List is selected as the input source, choose the MPEG language to display from the **Language List** drop-down list. The supported languages are according to ISO 639-2 Language Codes.
- If Language Entry is selected as the input source, enter the three-character code provided by your uplink service provider (for example, eng for English) in the **Manual Entry** field. The supported languages are according to ISO 639-2 Language Codes.
- If PMT is selected as the input source, choose the subtitle PID entry to display (First to Eighth) from the **PMT Order** drop-down list. This information is available from your uplink provider.

**Step 5** From the **Imitext Position** drop-down list, choose the position of the on-screen subtitle text (Standard or Extended). This setting is only applicable if the Subtitle Control is set to On or Imitext.

**Step 6** From the **Imitext Foreground Color** drop-down list, choose the color for Imitext subtitles. Auto displays text in the color transmitted by the subtitling equipment. Yellow and White overrides the color set by the uplink and display text in the selected color. This setting is only applicable if the Subtitle Control is set to On or Imitext.

**Step 7** From the **Imitext Background Color** drop-down list, choose one of the following text background for Imitext subtitles:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>Uses the uplink subtitling equipment setting.</td>
</tr>
<tr>
<td>Shadow</td>
<td>Applies an outline to the right side of each text character. No background box is applied to subtitles, that is, text is visible directly on top of video.</td>
</tr>
</tbody>
</table>
### Applying Inband Settings

You can apply uplink parameters for transcoding (such as, bit rate, GOP, and resolution) to the local transcoder settings for the selected program entry. This is only supported with an uplink that uses uplink transcoding controls for the user address of the selected program entry.

**Step 1**  
From the D9800 web GUI, choose Transport Stream > Transcoder Setup, and click Apply Inband Settings. Or, from the main menu of the D9800 front panel, choose Setup > Outputs > TS Out > Transcode > Inband.

**Step 2**  
Check the transcoder/program entry check box that you want to apply uplink parameters, or choose the program entry from the PE front panel menu and then choose Yes or No from the Apply Inband front panel menu.

The disabled check box on the web GUI indicates that you do not have sufficient transcoder licenses.

**Step 3**  
Click OK.

### Viewing the Transcoder Status

The Transcoder status page is available on multi-stream units only (D9800-MS-MPEGOIP). It displays the input and output format and bit rates for all the transcoder outputs.
Configuring the IP Settings

This section describes how to set up and configure the Management, DATA1, and DATA2 ports for the D9800 Network Transport Receiver.

- Setting up the IP Information, on page 135
- Setting up the Unicast Routing Information, on page 137
- Setting up SNMP Information, on page 138
- Configuring the DNS Server, on page 139
- Using the Ping or Traceroute Tool, on page 139

Setting up the IP Information

IP Settings allow you to set the parameters for communicating with other equipment via the Ethernet Data and Management ports for IP applications and upgrading application software.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>From the D9800 web GUI, choose System Settings &gt; IP Settings. Or, from the Main Menu of the D9800 front panel, choose Setup &gt; IP &gt; IP.</td>
</tr>
<tr>
<td>Step 2</td>
<td>In the IP Settings table, click the Ethernet interface you want to configure settings (Management, Data 1, Data 2, Data 3, or Data 4 port on the rear panel). On the front panel, the Port ID front panel menu allows you to select 1 for the Management port, 2 for the DATA1 port, 3 for the DATA2 port, 4 for the DATA3 port, or 5 for the DATA4 port.</td>
</tr>
<tr>
<td>Step 3</td>
<td>In the Destination IP Address field, or the IP Address front panel menu, enter the IPv4 destination IP address for the interface.</td>
</tr>
<tr>
<td>Step 4</td>
<td>In the Mask field or front panel menu, enter the number of CIDR (Classless Inter-Domain Routing) bits (8 to 30).</td>
</tr>
<tr>
<td>Step 5</td>
<td>In the Gateway Address field or the Gateway front panel menu, enter the gateway address on the Network, used to expose the receiver to a WAN. The IP Address, IP Mask, and Gateway Address should be changed together, that is, as a group. The following table shows the most commonly used Subnet mask values to enter for a chosen IP address mask, which will depend on the size of your network.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mask</th>
<th>Subnet Mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>255.0.0.0</td>
</tr>
<tr>
<td>16</td>
<td>255.255.0.0</td>
</tr>
<tr>
<td>24</td>
<td>255.255.255.0</td>
</tr>
</tbody>
</table>
Step 6  From the **PHY Mode** drop-down list or front panel menu, choose the speed and duplex type of the interface. Choose Auto for PHY to negotiate speed and duplex with other devices on the network, or choose 10 HD (half-duplex), 10 FD (full-duplex), 100 HD, 100 FD, or 1000 FD to lock into a fixed mode. Otherwise, choose N/A. The default is Auto.

Step 7  Save or apply the changes.

---

### Viewing the IP Link Status

The Link Status table on the IP Settings page (System Settings > IP Settings), and the **Link Status** menu on the front panel (Status > IP > Link) display the port information, such as the status, speed, and duplex. The **Port ID** column displays the name of the ports on the rear panel. The Data3 and Data4 ports are only applicable on multi-stream units.

### Configuring the Remote Access Protocols

The **Protocol Control** area, or **Protocols** front panel menu, allows you to control remote access protocols to the D9800 unit (HTTP, HTTPS via HTTP secure setting, IGMP, and SNMP).

---

**Step 1**  From the D9800 web GUI, choose **System Settings > IP Settings** and refer to the **Protocol Control** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > IP > Protocols**.

**Step 2**  From the **HTTP** drop-down list or front panel menu, choose **HTTP** to allow HTTP connection. The associated TCP port number is 80.

Choose **HTTPS** (default) to enable an encrypted access to the websever. The associated TCP port number is 443. When you click **Apply**, a confirmation message is displayed that you will be logged out automatically. It will reconfigure the device and the next time a user logs in, the user will access the encrypted version (HTTPS). An untrusted connection warning message is displayed (first time only). Add the current address as an exception and the user can access the D9800 web GUI.

**Note**  The HTTPS is displayed in the IP address to denote that it is a secure access.

Choose Disable to disable HTTP connections. If HTTP and SNMP options are disabled, you can only access the D9800 via the front panel.

**Step 3**  From the **SNMP** drop-down list or front panel menu, choose Enable to allow SNMP connections. The associated UDP port number is 161. Choose Disable to disable SNMP connections. If HTTP and SNMP options are disabled, you can only access the D9800 via the front panel.

**Step 4**  From the **IGMP** drop-down list or front panel menu, choose the Internet Group Management Protocol (IGMP) standard. This is used by the host, for multicast input, to send join or leave requests to the IGMP server, and to establish multicast group memberships.

**Note**  If configured, the source filtering in MPEGoIP Flow Configuration applies to IGMPv3. For more information, see Configuring the MPEG over IP Input, on page 49.

**Step 5**  In the **Idle Timeout (seconds)** field, enter the number of seconds before the session for all the enabled protocols will timeout due to inactivity, in a range from 30 to 1209600 seconds. Enter zero to never timeout.
Configuring the System Logs

Step 1  From the D9800 web GUI, choose System Settings > IP Settings and refer to the Protocol Control area. Or, from the Main Menu of the D9800 front panel, choose Setup > IP > Protocols.

Step 2  From the Syslog drop-down list or front panel menu, choose the logging protocol to use (Syslog TCP or Syslog UDP), or choose Disable to disable the system logging. The default port number is 514 for TCP and UDP.

Step 3  In the Syslog Server IP Address field or the Syslog Server front panel menu, enter the IP address of the server, and the UDP or TCP port number of the server in the Syslog Server Port field or the Port front panel menu.

We highly recommend that you use the following syslog servers:

- Syslog-ng - Balabit for Linux (http://www.balabit.com/networksecurity/syslog-ng/opensource-logging-system)

Step 4  Apply the changes.

Setting up the Unicast Routing Information

Step 1  From the D9800 web GUI, choose System Settings > IP Unicast Routing.

Step 2  In the Static Unicast Routing table, do the following to set the static unicast routing information used by the MPEGoIP. It can also be used to find hosts behind a router (for example, a syslog server or an NTP server).

- a) Click the + sign to add a row.
- b) In the Destination IP Address field, enter the destination IP address for the unicast route.
- c) In the Mask field, enter the number of Classless Inter-Domain Routing (CIDR) bits (8 to 30).
- d) In the Gateway Address field, enter the gateway address on the network used to expose the receiver to a WAN. The table below shows the most commonly used subnet mask values to enter for a chosen IP address mask, depending on the size of your network.

<table>
<thead>
<tr>
<th>Mask</th>
<th>Subnet Mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>255.0.0.0</td>
</tr>
<tr>
<td>16</td>
<td>255.255.0.0</td>
</tr>
<tr>
<td>24</td>
<td>255.255.255.0</td>
</tr>
</tbody>
</table>

e) To specify the port to use for the unicast route, check the Port 1 and/or Port 2 check box. Port 1 is the DATA1 port, and port 2 is the DATA2 port.

Step 3  Click Save.
The routing information is displayed in the Installed Unicast Routes table. If the configured routing information has an inactive port, then the routing information is not displayed in the Installed Unicast Routes table.

### Setting up SNMP Information

**Step 1** From the D9800 web GUI, choose `System Settings > SNMP`. Or, from the Main Menu of the D9800 front panel, choose `Setup > IP > IP`.

**Step 2** In the `Read Only Community String` and the `Read Write Community String` fields or front panel menus, enter public (default) or a custom string. Set the password to read or write data from a device and to display diagnostic traps or alarms. This is used when communicating with a device within an SNMP environment. To set a custom community string, enter an alphanumeric character string up to 31 alphanumeric characters in length identifying the password for the device.

**Note** The community string is case-sensitive.

**Step 3** In the `System Name`, `System Location`, and `System Contact` fields, enter the system name, location, and contact information of the D9800 receiver. The system information is sent to the MIB browser, if applicable. The MIB Browser is a third party software used to manage SNMP requests. For more information, contact Cisco Services.

**Step 4** Apply the changes.

### Adding Trap Destinations

**Step 1** From the D9800 web GUI, choose `System Settings > SNMP`. Or, from the Main Menu of the D9800 front panel, choose `Setup > IP > Traps`.

**Step 2** In the `Trap Destination Configuration` area, click the + icon to add an IP address, or choose the `Ins` front panel menu.

**Step 3** In the `Trap Destination IP Address` field or front panel menu, enter the IP address that sets the destination for SNMP trap messages for system events (for example, alarms).

**Step 4** In the `Community String` field or use the right arrow key to choose the `Trap Community String` front panel menu, enter the community string for the trap destination (public or custom string). You can enter up to 35 characters. The default is public.

**Step 5** Click `Save` or apply the changes on the front panel.

**What to do next**

To edit or delete an existing trap destination, select the trap destination entry by clicking on the radio button. Make the necessary changes, or click `Delete` to remove the address from the Trap Destination Configuration list.

To edit an existing entry on the front panel, scroll to the IP address and press SELECT to edit the address. To delete an existing entry on the front panel, scroll to the IP address you want to delete and choose `Del`. 
Configuring the DNS Server

Step 1 From the D9800 web GUI, choose System Settings > IP Settings. Or, from the main menu of the D9800 front panel, choose Setup > IP > IP.

Step 2 Click DNS Server Configuration.

Step 3 Choose Global to set the IP address for all the ports (Management, DATA1, DATA2, DATA3, and DATA4), or choose Per Interface to set the IP address for a specific port, used for ABR streams. Or, from the Port front panel menu, choose 1 for the Management port, 2 for DATA 1 port, 3 for DATA 2 port, 4 for DATA 3 port, or 5 for DATA 4 port.

Step 4 In the Primary, Secondary, and/or Tertiary fields, or from the DNS Primary, DNS Secondary, and/or DNS Tertiary front panel menus, enter the IP address of the DNS servers. We highly recommend that you enter a secondary and/or tertiary DNS server address, as backups to the primary DNS server address.

Step 5 Apply the changes.

Using the Ping or Traceroute Tool

For troubleshooting purposes, you can verify whether you can reach an external IP address via the management and/or data ports by using the ping or traceroute tool. The Ping functionality allows you to determine whether the IP address can be reached. The Traceroute functionality displays how long a packet takes, along the network, to reach its destination.

Step 1 From the D9800 web GUI, choose System Settings > IP Ping/Traceroute.

Step 2 In the IP Address or Domain Name field, enter the IP address or a Fully Qualified Domain Name (FQDN) you want to ping or display the traceroute information.

Step 3 From the Port drop-down list, choose Management, Data1, Data2, Data3, or Data4 port.

Step 4 Click Ping to verify the IP address through the selected port, or click Traceroute to display the route and packet information for the selected IP address and port.
Using the Ping or Traceroute Tool
D9800 Alarm and Warning Messages

This section describes all the alarms and warnings for the D9800 Network Transport Receiver. It also describes how to view and access the alarms and warnings.

- About Alarms and Warnings, on page 141
- Alarms, on page 141
- Warnings, on page 162
- Setting up Alarms, on page 170
- Setting up Warnings, on page 171
- Viewing Alarm/Warning History, on page 172
- Viewing the Alarm/Warning Status, on page 172

About Alarms and Warnings

The alarm LED on the front panel indicates whether the unit has triggered an alarm or warning. A solid red signal for five seconds indicates a warning, and a flashing red signal indicates an alarm.

The status of the D9800 receiver and its immediate surroundings is reported to the front panel in the form of messages and alarms. You can enable or disable messages. For more information, see Setting up Alarms, on page 170 and Setting up Warnings, on page 171.

Note

Only alarm conditions can be used to trigger rear panel relays to control external alarm equipment. Warnings are not associated with relay operations.

It is recommended that you collect the debug support data prior to contacting Cisco customer support for any D9800 issues. For more information, see Exporting Debug Support Data, on page 38.

Alarms

The table below displays a list of alarms, with causes and remedies. The Set and Clear messages are displayed in the Alarm History when the messages are set or cleared respectively.
The following alarm is not supported in the current release: Inp Bandwidth Exceeded.

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Message Type</th>
<th>Message</th>
<th>Description, with Cause and Remedy</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABR Input, Audio 3&amp;4, DVB-S2, Full HD, H.264, H.265, HD Output, or UHD Output Not Licensed</td>
<td>Set</td>
<td>ABR Input, Audio 3&amp;4, DVB-S2, Full HD, H.264, H.265, HD Output, or UHD Output Not Licensed</td>
<td>An attempt was made to use DVB-S2, H.264, H.265, HD Output, Full HD, UHD Output, Audio 3,4, or ABR feature without a valid license. Contact Cisco Services for more information on obtaining the correct license.</td>
<td>Major</td>
</tr>
<tr>
<td>ABR Input, Audio 3&amp;4, DVB-S2, Full HD, H.264, H.265, HD Output, or UHD Output Not Licensed</td>
<td>Clear</td>
<td>ABR Input, Audio 3&amp;4, DVB-S2, Full HD, H.264, H.265, HD Output, or UHD Output license fault cleared</td>
<td>The DVB-S2, H.264, H.265, HD Output, Full HD, UHD Output, Audio 3,4, or ABR input is no longer being used or the feature is now licensed.</td>
<td>Major</td>
</tr>
<tr>
<td>ASI 1 or 2 Input Mute</td>
<td>Set</td>
<td>ASI 1 or 2 Input Muted, Please Check Noise.</td>
<td>The input has been muted due to excessive errors on the input. Correct source of errors on input to clear the alarm and unmute the input.</td>
<td>Major</td>
</tr>
<tr>
<td>ASI 1 or 2 Input Mute</td>
<td>Clear</td>
<td>ASI 1 or 2 Input Noise Cleared &amp; Unmuted.</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>ASI 1 or 2 Output Status</td>
<td>Set</td>
<td>ASI 1 or 2 Output Overflow &amp; Muted. Please Reduce Content.</td>
<td>ASI 1 or 2 output has overflowed (actual output rate is greater than the user setting), and it has been muted. Reduce output content to clear the alarm and unmute the output.</td>
<td>Major</td>
</tr>
<tr>
<td>ASI 1 or 2 Output Status</td>
<td>Clear</td>
<td>ASI 1 or 2 Output Overflow Cleared &amp; Unmuted.</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
<td>Severity</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------</td>
<td>----------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>App Startup Fault</td>
<td>Set</td>
<td>&lt;Version&gt; Failed to start</td>
<td>An attempt to start the specified version has failed. The unit will revert back to the previous version within ten minutes. If the problem persists, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>Audio 1, 2, 3, or 4 Invalid Config</td>
<td>Set</td>
<td>ST302 only valid for Audio Decode 1</td>
<td>An SMPTE ST302 audio PID is serviced on Audio Decode n, instead of the allowed Audio Decode 1 only. Ensure that the SMPTE ST302 audio PID is mapped to Audio Decode 1. Contact your uplink service provider or Cisco Services for more information.</td>
<td>Major</td>
</tr>
<tr>
<td>Audio 1, 2, 3, or 4 Invalid Config</td>
<td>Clear</td>
<td>Audio Config Fault Cleared</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>CI Top/Bottom Slot Status</td>
<td>Set</td>
<td>Initialization Fail</td>
<td>Initialization of the CAM in the top or bottom slot has failed. The possible causes are: CAM is damaged or not fully inserted, hardware issue, CAM software crash, or no subscription rights to the card. Re-insert the card. If problem persists, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
<td>Severity</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>--------------</td>
<td>--------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>CI Top/Bottom Slot Status</td>
<td>Set</td>
<td>No Descrambling</td>
<td>All elementary streams of all selected programs are not descrambled. The possible causes are: CAM is damaged or not fully inserted, hardware issue, CAM software crash, or no subscription rights to the card. Re-insert the card. If problem persists, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>CI Top/Bottom Slot Status</td>
<td>Clear</td>
<td>CAM Operation OK</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>CI Option, System, Tuner, or Decoder FPGA Mismatch</td>
<td>Set</td>
<td>CI Option, System, Tuner, or Decoder Version not in Synch</td>
<td>The unit is not running the selected System, Tuner, CI Option, or Decoder FPGA version. Reboot the unit with the correct FPGA version.</td>
<td>Major</td>
</tr>
<tr>
<td>CI Option, System, Tuner, Decoder FPGA Mismatch</td>
<td>Clear</td>
<td>—</td>
<td>The alarm is cleared when the unit is rebooted with the correct FPGA version.</td>
<td>Major</td>
</tr>
<tr>
<td>Config Mismatch Fault</td>
<td>Set</td>
<td>Config Mismatch Fault</td>
<td>Transcoder is generating video in a format that does not match the user’s selection. This is a configuration or software issue. Also seen temporarily on channel changes or changes in the video source format. If problem persists, contact Cisco Services.</td>
<td>Minor</td>
</tr>
<tr>
<td>Config Mismatch Fault</td>
<td>Clear</td>
<td>Mismatch Resolved</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
<td>Severity</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------</td>
<td>---------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>D/R in progress</td>
<td>Set</td>
<td>Disaster declared</td>
<td>One or more of the following is detected: RF lock loss, unstable RF signal, and/or transport loss (RF locked, but no transport stream packet received). Ensure you have a valid signal.</td>
<td>Major</td>
</tr>
<tr>
<td>D/R in progress</td>
<td>Reset</td>
<td>No disaster</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>Database Error</td>
<td>Set</td>
<td>Text 1: DB Name, with one of the following: Settings, History, Access, or SI.</td>
<td>The SQL DB validation utility reports that database SQL file in flash (eMMC) is missing or corrupted. The database backup file is used for recovery. If recovery attempt fails, the database will re-initialize, with default settings. If the access database is re-initialized, the IP-related configuration and protocols have been reset to defaults. Also, new credentials for the default user account was created. You must reset the default user account to gain online access to the unit. This can be done from the front panel. If the system detects and reports unrecoverable database conditions, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>Decode Overflow</td>
<td>Set</td>
<td>Decode Overflow</td>
<td>The transport rate to the main decoder board exceeds internal bandwidth limits. Reduce the video data rate at the uplink.</td>
<td>Major</td>
</tr>
<tr>
<td>Decode Overflow</td>
<td>Clear</td>
<td>Clear</td>
<td>Alarm automatically clears after five seconds.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
<td>Severity</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
<td>---------</td>
<td>-------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Decoder VeryLowMem (available on single-stream units only)) Controller, Transcoder#, or HEVC Proc# VeryLowMem (available on multi-stream units only)</td>
<td>Set</td>
<td>Decoder, Controller, Transcoder#, or HEVC Proc# VeryLowMem</td>
<td>Memory use on the Decoder, System (Controller), Transcoder, or HEVC Processor exceeded the critical operating threshold (90% of the physical memory). The system is in a critical state and may reboot automatically. If the problem persists, or it is indicated in the alarm history, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>Decoder, Controller, Transcoder#, or HEVC Proc# VeryLowMem</td>
<td>Clear</td>
<td>Decoder VeryLowMem fault cleared</td>
<td>The condition which caused memory use on the Decoder, System (Controller), Transcoder, or HEVC Processor to exceed the critical operating threshold has been resolved or replaced by the Decoder Low Memory Warning.</td>
<td>Major</td>
</tr>
<tr>
<td>Digital Program Mapping</td>
<td>Set</td>
<td>PID Collision</td>
<td>Two source service PIDs are being mapped to the same output PID, causing data corruption in the stream. This may be caused by changes to the uplink settings since setting up the unit. Change the DPM settings and check the uplink to find the appropriate system settings.</td>
<td>Minor</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
<td>Severity</td>
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</tr>
<tr>
<td>Digital Program Mapping</td>
<td>Set</td>
<td>Program Collision</td>
<td>Two source channel numbers are being mapped/ passed to the same channel number in the output. This may be caused by changes to the uplink settings since setting up the unit. Change the DPM settings and check the uplink to find the appropriate system settings.</td>
<td>Minor</td>
</tr>
<tr>
<td>Digital Program Mapping</td>
<td>Set</td>
<td>Mode-i PMT out of range</td>
<td>The PMT PID to be used for Mode-i is outside the valid MPEG PID range. This may be caused by changes to the uplink since setting up the unit. Change the DPM settings and check the uplink to find the appropriate system settings.</td>
<td>Major</td>
</tr>
<tr>
<td>Digital Program Mapping</td>
<td>Clear</td>
<td>Digital Program Mapping - OK</td>
<td>Message displayed when alarm is OK.</td>
<td>Major</td>
</tr>
<tr>
<td>Download Fault</td>
<td>Set</td>
<td>DL App Delete, DL Finalize App, DL Finalize FPGA, DL Load FPGA, DL Set Next APP, DL Store, or DL Validate</td>
<td>Each download messages have detailed descriptions. Alarm automatically clears before the next download is triggered.</td>
<td>Major</td>
</tr>
<tr>
<td>Download Fault</td>
<td>Clear</td>
<td>Clear DL Alarm</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
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</tr>
<tr>
<td>FPGA Temperature Alarm</td>
<td>Set</td>
<td>ecc_set_fpga_temp_alarm: Alarm: [FPGA name] [value]</td>
<td>The FPGA temperature is above safe operating range, caused by room temperature too high or air flow is blocked. Check openings on front and rear panels for blockage. Lower room temperature or improve air flow to device. If problem persists, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>FPGA Temperature Alarm</td>
<td>Clear</td>
<td>ecc_reset_fpga_temp_alarm</td>
<td>Message displayed when alarm is cleared, indicating that the FPGA temperature is within the safe operating range.</td>
<td>Major</td>
</tr>
<tr>
<td>Fan</td>
<td>Set</td>
<td>ecc_set_fan_alarm: Alarm: [FAN name] alarm [Value]</td>
<td>Fan RPM is out of normal operating range, due to a hardware issue. Return the unit to Cisco Services as soon as possible.</td>
<td>Major</td>
</tr>
<tr>
<td>Fan</td>
<td>Clear</td>
<td>ecc_reset_fan_alarms</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>Signal Status</td>
<td>Set</td>
<td>ASI/RF Signal - No Content</td>
<td>ASI link or RF signal locked, but no content due to loss of transport data or invalid frequency parameters. This error is external to the unit. Check the tuning parameters and ASI or RF cables.</td>
<td>Minor</td>
</tr>
<tr>
<td>Input &lt;n&gt; Signal Status</td>
<td>Set</td>
<td>Signal is lost</td>
<td>Loss of signal due to loss of transport data or invalid frequency parameters. This error is external to the unit. Check the tuning parameters and ASI or RF cables.</td>
<td>Minor</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
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</tr>
<tr>
<td>Input &lt;n&gt; Signal Status</td>
<td>Set</td>
<td>Tuning Parameters Invalid</td>
<td>One of the tuning parameters is invalid, due to loss of transport data or invalid frequency parameters. This error is external to the unit. Check the tuning parameters and ASI or RF cables.</td>
<td>Minor</td>
</tr>
<tr>
<td>Input &lt;n&gt; Signal Status</td>
<td>Clear</td>
<td>Signal is locked or Tuning Parameters Valid</td>
<td>Message displayed when alarm is cleared, indicating that the signal is OK or the tuning parameters are valid.</td>
<td>Minor</td>
</tr>
<tr>
<td>Input Underflow, Input Overflow, Output Underflow, or Output Overflow</td>
<td>Set</td>
<td>Input Underflow, Input Overflow, Output Underflow, or Output Overflow</td>
<td>Internal transcoder buffer overflow or underflow. Errors will be seen in the transcoded output. Possible transcoder firmware error. If problem persists, contact Cisco Services.</td>
<td>Minor</td>
</tr>
<tr>
<td>Input Underflow, Input Overflow, Output Underflow, or Output Overflow</td>
<td>Clear</td>
<td>Problems cleared</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>LEC Timeout</td>
<td>Set</td>
<td>LEC Table Missing/timeout: channels currently unavailable</td>
<td>The ECT table is not received in the GDS stream, due to an issue with the LEC server or uplink. Check LEC server setup and uplink configuration for the GDS PID setup. Clear alarm and notify Cisco Services if problem persists.</td>
<td>Major</td>
</tr>
<tr>
<td>LEC Timeout</td>
<td>Clear</td>
<td>LEC received</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
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</tr>
<tr>
<td>LNB PS</td>
<td>Set</td>
<td>LNBPS: No Load, LNBPS: Over Temperature, or LNBPS: Short Circuit</td>
<td>The LNB power is overloaded, due to possible wiring or hardware issue. Clear alarm, reset the unit, and notify Cisco Services if the problem persists.</td>
<td>Minor</td>
</tr>
<tr>
<td>LNB PS</td>
<td>Set</td>
<td>LNBPS: Normal/Disabled/Off</td>
<td>Message displayed when alarm is cleared. The LNB power is operating normally.</td>
<td>Minor</td>
</tr>
<tr>
<td>Low Intra-Inter scores</td>
<td>Set</td>
<td>Low Intra-Inter scores</td>
<td>Transcoded video quality is degraded and artifacts may be seen in the transcoded video. Possible transcoder firmware error. If problem persist, contact Cisco Services.</td>
<td>Minor</td>
</tr>
<tr>
<td>Low Intra-Inter scores</td>
<td>Clear</td>
<td>Quality restored</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>MOIP 1 or 2 Output Overflow</td>
<td>Set</td>
<td>MOIP 1 or 2 Output Overflow &amp; Muted. Please Reduce Content.</td>
<td>MOIP 1 or 2 output has overflowed (actual output rate is greater than user setting), and it has been muted. <strong>Note</strong> MOIP 1 or 2 refers to port pair 1 (ports 1 and 2), or 2 (ports 3 and 4). Reduce output content to clear alarm and unmute the output.</td>
<td>Major</td>
</tr>
<tr>
<td>MOIP 1 or 2 Output Overflow</td>
<td>Clear</td>
<td>MOIP 1 or 2 Output Overflow Cleared &amp; Unmuted.</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
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</tr>
<tr>
<td>MPoIP Bitrate Port #1 2, 3, or 4</td>
<td>Set</td>
<td>Total configured output is marginal or too high</td>
<td>The configured MPEG over IP bandwidth is close to or higher than the ETH port 1 or 2 link speed. This condition can trigger the actual MPoIP Overflow alarm. Re-configure the output rate of the stream to be within 90% of the link speed on the ETH port 1 or 2.</td>
<td>Major</td>
</tr>
<tr>
<td>MPoIP Bitrate Port #1, 2, 3, or 4</td>
<td>Clear</td>
<td>Total configured output is normal Inactive port, monitoring stopped No active stream(s), monitoring stopped Link is down, monitoring stopped</td>
<td>Message displayed when the warning is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>MPoIP Engine Failure</td>
<td>Set</td>
<td>MPEGoIP Overflow. Output Muted. Reduce Content.</td>
<td>The uplink settings may have changed since setting up the unit. The variable bit rate or stream may be in use. Increase the output rate, drop unreferenced content in DPM options, and drop programs not needed for downstream devices. Contact the (uplink) service provider to verify the expected bit rate settings.</td>
<td>Minor</td>
</tr>
<tr>
<td>MPoIP Engine Failure</td>
<td>Set</td>
<td>Critical MPoIP Engine Failure, all active streams must be restarted</td>
<td>Hardware failure and the MPEGoIP output is automatically restarted. Check that the input stream is from a known source and reset the unit. If the problem persists, contact Cisco Services.</td>
<td>Major</td>
</tr>
</tbody>
</table>
### D9800 Alarm and Warning Messages

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Message Type</th>
<th>Message</th>
<th>Description, with Cause and Remedy</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPoIP Engine Failure</td>
<td>Clear</td>
<td>MPEGoIP Output Restored</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>MPoIP Engine Failure</td>
<td>Clear</td>
<td>Error Cleared</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>MPoIPI: DJ HW fail</td>
<td>Set</td>
<td>De-jittering Engine Error, HW Restarted</td>
<td>The de-jittering block has an overflow, underflow, or other hardware problems. Reset the de-jittering block. However, in most cases, the problem is triggered by the stream originator or network conditions and cannot be fixed in the unit. Contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>MPoIPI: DJ HW fail</td>
<td>Clear</td>
<td>Fault Cleared: No errors</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>MPoIPI: DJ HW fail</td>
<td>Clear</td>
<td>Fault Cleared: Input disabled</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>NIT Retune Recovery</td>
<td>Set</td>
<td>NIT Retune Recovery</td>
<td>An invalid NIT is received and the unit fails to lock/acquire the NIT signal. Contact your uplink administrator to correct the invalid NIT on the uplink so that the signal can be locked and acquired. The administrator should also ensure that the uplink configuration matches the NIT.</td>
<td>Major</td>
</tr>
<tr>
<td>NIT Retune Recovery</td>
<td>Clear</td>
<td>Alarm cleared</td>
<td>Message displayed when another valid NIT is received and the signal is locked and acquired, or the incorrect configuration is resolved.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
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</tr>
<tr>
<td>PE n CI Status</td>
<td>Set</td>
<td>Program Not Descrambled</td>
<td>All elementary streams for this service selected for descrambling were not descrambled by the CAM. This may be caused by a hardware issue, CAM software crash, or no subscription rights to the smart card. Reinsert the CAM and/or check your rights for the smart card.</td>
<td>Major</td>
</tr>
<tr>
<td>PE n CI Status</td>
<td>Set</td>
<td>1 or more ES Not Descrambled</td>
<td>At least 1 elementary stream is not descrambled, but the CAM is still descrambling other elementary streams for this service. This may be caused by a hardware issue, CAM software crash, or no subscription rights to the smart card. Reinsert the CAM and/or check your rights for the smart card.</td>
<td>Major</td>
</tr>
<tr>
<td>PE n CI Status</td>
<td>Clear</td>
<td>Descrambling OK</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>PE n: CA System Error</td>
<td>Set</td>
<td>No PowerVu support or No Matching CAM</td>
<td>The CA system in the currently selected channel cannot be descrambled due to no PowerVu ISE or CAM support. Check the Installation and Configuration Guide for PowerVu descrambling support. Ensure that the appropriate CAM is inserted and that the PE CAM slot is assigned correctly.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: CA System Error</td>
<td>Clear</td>
<td>Fault Cleared</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>Alarm</td>
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</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Set</td>
<td>Channel is not authorized</td>
<td>The channel is unauthorized for the current program, due to bits not matching. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.</td>
<td>Major</td>
</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Set</td>
<td>Channel requires an authorization key</td>
<td>The channel is unauthorized for the current program because the unit does not have an authorization key. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Set</td>
<td>Channel is blacked out</td>
<td>The channel is unauthorized for the current program because it does not match one blackout code, at a minimum. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Set</td>
<td>Channel uses an unknown CA system</td>
<td>The conditional access used is not supported. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.</td>
<td>Minor</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
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</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Set</td>
<td>Channel authorization refused</td>
<td>There is a mismatch in the conditional access. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Set</td>
<td>Channel requires an IRD with CA support</td>
<td>The conditional access is not supported. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Set</td>
<td>Channel requires the PE to have an ISE</td>
<td>There is a hardware issue. Clear alarm, reset unit, and notify Cisco Services if problem persists.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Set</td>
<td>Security Request Not Applicable</td>
<td>The channel is unauthorized for the current program. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: ISE Not Auth</td>
<td>Clear</td>
<td>Fault Reset or Channel is authorized</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: Loss of Input</td>
<td>Set</td>
<td>Loss of input detected</td>
<td>There is a loss of input. Ensure that the input has a valid stream.</td>
<td>Minor</td>
</tr>
<tr>
<td>PE n: Loss of Input</td>
<td>Clear</td>
<td>Fault reset</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>Alarm</td>
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</tr>
<tr>
<td>Shutdown Event</td>
<td>Set</td>
<td>DL APP REBOOT</td>
<td>New application downloaded, system requires reboot or internal system error. If it is an internal system error fault, clear alarms, reset the unit, notify Cisco Services if the problem persists.</td>
<td>Major</td>
</tr>
<tr>
<td>Shutdown Event</td>
<td>Set</td>
<td>User requested FPGA change, User requested APP change, User requested factory reset, User requested reboot, User requested service restore, or PRODUCTION - Protect Flash</td>
<td>The following requires a reboot: Runnable FPGA change, runnable application change, factory reset, user reboot request, restore operation, or production tables removed. If it is an internal system error fault, clear alarms, reset the unit, notify Cisco Services if the problem persists.</td>
<td>Major</td>
</tr>
<tr>
<td>Shutdown Event</td>
<td>Set</td>
<td>I2C Failure</td>
<td>Internal system error, due to possible software/hardware issue. Clear alarms, reset unit, notify Cisco Services if the problem persists.</td>
<td>Major</td>
</tr>
<tr>
<td>Shutdown Event</td>
<td>Set</td>
<td>WDOG: FPGA not loaded</td>
<td>FPGA has not been loaded, due to possible software/hardware issue. Clear alarms, reset unit, notify Cisco Services if the problem persists.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
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</tr>
<tr>
<td>Shutdown Event</td>
<td>Set</td>
<td>UD - ud_init_phase_4() FAILED to create partition, '--- COMPONENT 'AAA' FAILED TO INIT IN PHASE X, rc=NNN, VBI DB creation failed, VBI DB allocation failed, VBI Status DB creation failed, VBI Status DB allocation failed, UIC_ENUM_CL given invalid ENUM_ST: item = AAA, table = BBB, problem with primary: X, FW: Memory or List Full, Framework Registration Error, or Watchdog 'AAA' has expired</td>
<td>Internal system error, due to possible software issue. Clear alarms, reset unit, notify Cisco Services if the problem persists.</td>
<td>Major</td>
</tr>
<tr>
<td>Shutdown Event</td>
<td>Set</td>
<td>DB_Table_Cl::addTable() failed, DB_Table_Cl::addItem() failed: too many DB Items, DBT Init Failed: AAA, Framework Registration Error, 7109 exception! Code = X, Address = Y, Task = Z, Memory Error: AAA, Phase X, Time Control object creation failed, Wrong UIC Item detected: item = AAA, or table BBB</td>
<td>Internal system error, due to possible software issue. Clear alarms, reset unit, notify Cisco Services if the problem persists.</td>
<td>Major</td>
</tr>
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<td>Alarm</td>
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</tr>
<tr>
<td>Shutdown Event</td>
<td>Set</td>
<td>Memory allocation error on UIC table construction, Error adding UIC table(AAA), HTTP - http_init4() FAILED to create partition, http_init4: FAILED to allocate scratch buffer, HTTP - http_init4() FAILED to allocate memory from AVMEM Partition, or UD - ud_init_phase_4() FAILED to allocate memory from System Partition</td>
<td>Internal system error, due to possible software issue. Clear alarms, reset unit, notify Cisco Services if the problem persists.</td>
<td>Major</td>
</tr>
<tr>
<td>Shutdown Event</td>
<td>Set</td>
<td>UD - ud_init_phase_4() FAILED to create partition, '--- COMPONENT 'AAA' FAILED TO INIT IN PHASE X, re=NNN, VBI DB creation failed, VBI DB allocation failed, VBI Status DB creation failed, VBI Status DB allocation failed, UIC_ENUM_CL given invalid ENUM_ST: item = AAA, table = BBB, problem with primary: X, FW: Memory or List Full, Framework Registration Error, or Watchdog 'AAA' has expired</td>
<td>Internal system error, due to possible software issue. Clear alarms, reset unit, notify Cisco Services if the problem persists.</td>
<td>Major</td>
</tr>
<tr>
<td>Signal Quality</td>
<td>Set</td>
<td>Audio Muted due to RF noise or Poor Quality RF Signal</td>
<td>Signal is locked, but BER is beyond the audio muting threshold, causing a poor RF signal. This is due to interference or signal level issues. Check RF settings, re-aim the satellite dish, and add a signal amplifier.</td>
<td>Minor</td>
</tr>
<tr>
<td>Alarm</td>
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</tr>
<tr>
<td>Signal Quality</td>
<td>Set</td>
<td>Unstable RF Signal</td>
<td>The signal lock status is toggling frequently, causing a poor RF signal. This is due to interference or signal level issues. Check RF settings, re-aim the satellite dish, and add a signal amplifier.</td>
<td>Minor</td>
</tr>
<tr>
<td>Signal Quality</td>
<td>Set</td>
<td>Signal Quality Fault</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>System Startup</td>
<td>Set</td>
<td>System Startup</td>
<td>Indicates that the unit has started up, due to an expected or unexpected reset. This alarm will clear after one second. If the startup was unexpected, check for last reset cause. If the problem persists, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>Transport Processing</td>
<td>Set</td>
<td>IP1 Stack Filter Fatal Error</td>
<td>Indicates that the unit has an incorrect input stream on the IP input. In that state, all the IP inputs on the unit stop working. This alarm is cleared by a system reset only.</td>
<td>Major</td>
</tr>
<tr>
<td>TS Input Overflow</td>
<td>Set</td>
<td>TS Input Overflow</td>
<td>The input transport rate exceeds the internal bandwidth limits. Reduce the input transport rate so that it is below the ASI/MOIP output transport rate.</td>
<td>Major</td>
</tr>
<tr>
<td>TS Input Overflow</td>
<td>Clear</td>
<td>Clear</td>
<td>Alarm automatically clears after five seconds.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
<td>Severity</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------</td>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>TS Intern Buf Overflow</td>
<td>Set</td>
<td>TS Output Overflow</td>
<td>Too much content routed to the transport output path, resulting in internal transport processing overflow. Reduce output transport content to clear the alarm.</td>
<td>Major</td>
</tr>
<tr>
<td>Temperature Alarm</td>
<td>Set</td>
<td>Temperature over Alarm threshold</td>
<td>The temperature of the unit is above safe operating range, caused by room temperature too high or air flow is blocked. Check openings on front and rear panels for blockage. Lower room temperature or improve air flow to device.</td>
<td>Major</td>
</tr>
<tr>
<td>Temperature Alarm</td>
<td>Clear</td>
<td>Temperature normal</td>
<td>Message displayed when alarm is cleared, indicating that the temperature is within the safe operating range.</td>
<td>Major</td>
</tr>
<tr>
<td>Throttling fault</td>
<td>Set</td>
<td>Throttling fault</td>
<td>Transcoded video quality is degraded and artifacts may be seen in the transcoded video. Possible transcoder firmware error. If problem persists, contact Cisco Services.</td>
<td>Minor</td>
</tr>
<tr>
<td>Throttling fault</td>
<td>Clear</td>
<td>Quality Restored</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
<tr>
<td>Transcoder Reset</td>
<td>Set</td>
<td>Firmware Reset On Going</td>
<td>The software is unable to initialize the transcoder chip. This is a possible hardware issue. Reboot the unit. If the issue is intermittent, the condition may be cleared by the reboot.</td>
<td>Major</td>
</tr>
<tr>
<td>Transcoder Reset</td>
<td>Clear</td>
<td>Firmware Reset Completed</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
<td>Severity</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------</td>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Transcoder load or Init</td>
<td>Set</td>
<td>Transcoder load or Init</td>
<td>Attempt to load or reload the transcoder firmware has not been successful and the transcoded output will not be present. Power-cycle the unit. If the problem persists or occurs frequently, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>Transcoder load or Init</td>
<td>Clear</td>
<td>Load and Init Completed</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>Unsupported AR</td>
<td>Set</td>
<td>Unsupported AR</td>
<td>Video format of one of the channels is not supported by this decoder. The input stream configuration is incorrect. Request a compatible stream format from your uplink provider.</td>
<td>Minor</td>
</tr>
<tr>
<td>Unsupported Vid Format</td>
<td>Set</td>
<td>Unsupported Vid Format</td>
<td>Video format of one of the channels is not supported by this decoder. The input stream configuration is incorrect. Request a compatible stream format from your uplink provider.</td>
<td>Minor</td>
</tr>
<tr>
<td>Unsupported Vid Prof</td>
<td>Set</td>
<td>Unsupported Vid Prof</td>
<td>Video format of one of the channels is not supported by this decoder. The input stream configuration is incorrect. Request a compatible stream format from your uplink provider.</td>
<td>Minor</td>
</tr>
<tr>
<td>Unsupported Vid Prof</td>
<td>Clear</td>
<td>Problems cleared</td>
<td>Message displayed when alarm is cleared.</td>
<td>Minor</td>
</tr>
</tbody>
</table>
### Warnings

The table below displays a list of warnings, with causes and remedies. The Set and Clear messages are displayed in the Warning History when the messages are set or cleared respectively.

**Note**

The following warnings are not supported in the current release: D/R No Search Path, D/R Malformed DRT, D/R No DRT Received, D/R Invalid Tuning, D/R Invalid L-Band, D/R Value Out of Range, D/R Rolloff Invalid, D/R LO Freq Mismatch, Xcode Delay Pkt Drop, and Xcode Video Buff Offw.

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Message Type</th>
<th>Message</th>
<th>Description, with Causes and Remedies</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version Mismatch</td>
<td>Set</td>
<td>Version Mismatch</td>
<td>The active versions on all the smart cards (for example, controller and decoder cards) are not the same. Reload a different application version (if applicable) and reboot the receiver. If the problem persists, contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>Xcode License fault</td>
<td>Set</td>
<td>Working transcoders are fewer than the licenses</td>
<td>The number of working transcoders are fewer than the number of licenses provisioned. This is a possible hardware failure. Contact Cisco Services.</td>
<td>Major</td>
</tr>
<tr>
<td>Xcode License fault</td>
<td>Clear</td>
<td>Transcoder working.</td>
<td>Message displayed when alarm is cleared.</td>
<td>Major</td>
</tr>
<tr>
<td>APSK Not Licensed</td>
<td>Set</td>
<td>Unlicensed APSK signal is detected</td>
<td>An attempt was made to tune to a RF signal with 16APSK or 32APSK modulation type, without a valid license. Contact Cisco Services for more information on obtaining the APSK license.</td>
<td></td>
</tr>
<tr>
<td>Warning</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Causes and Remedies</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------</td>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>ASI 1 or ASI 2 Output Overflow</td>
<td>Set</td>
<td>ASI Output N Overflow Fault</td>
<td>The transport out data rate exceeds the configured limit. This will result in the affected output being muted. Increase the output rate, drop unreferenced content in DPM Options, and drop the programs that are not needed for downstream devices. Contact your (uplink) service provider to verify the expected bit rate settings.</td>
<td></td>
</tr>
<tr>
<td>ASI 1 or ASI 2 Output Overflow</td>
<td>Clear</td>
<td>ASI Output Overflow Fault Cleared</td>
<td>Message displayed when the warning is cleared.</td>
<td></td>
</tr>
<tr>
<td>Backup Failure Reason</td>
<td>Set</td>
<td>Internal Error</td>
<td>Backup ran out of memory or other internal error. Clear warnings and reset the unit. If the problem persists, contact Cisco Services.</td>
<td></td>
</tr>
<tr>
<td>Backup Failure Reason</td>
<td>Clear</td>
<td>Clear</td>
<td>Message displayed when restore is completed.</td>
<td></td>
</tr>
<tr>
<td>Backup Operation State</td>
<td>Set</td>
<td>Backup Active</td>
<td>The backup state is displayed, for information purposes only. No action required.</td>
<td></td>
</tr>
<tr>
<td>Backup Operation State</td>
<td>Clear</td>
<td>Backup Complete</td>
<td>Message displayed when backup is completed.</td>
<td></td>
</tr>
<tr>
<td>Warning</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Causes and Remedies</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------</td>
<td>---------</td>
<td>---------------------------------------</td>
<td></td>
</tr>
<tr>
<td>CAT, DRT, ECT, MCT, NIT, PAT, PMT, SDT, or TDT warning</td>
<td>Set</td>
<td>CAT, DRT, ECT, MCT, NIT, PAT, PMT, SDT, or TDT n timed out</td>
<td>The following table was never received: Time Date Table (TDT), Service Description Table (SDT), Program Mapping Table (PMT), Program Association Table (PAT), Network Information Table (NIT), Conditional Access Table (CAT), Disaster Recovery Table (DRT), Inband Control Table (MCT), or Event Control Table (ECT). Clear warning. If the problem persists, determine if uplink is sending the current SI information table. Disable the warning if not using the table.</td>
<td></td>
</tr>
<tr>
<td>CAT, DRT, ECT, MCT, NIT, PAT, PMT, SDT, or TDT warning</td>
<td>Set</td>
<td>&lt;Input Name&gt; CAT, DRT, ECT, MCT, NIT, PAT, PMT, SDT, or TDT timed out or is lost</td>
<td>No longer receiving the specified table. Clear warning. If the problem persists, determine if uplink is sending the current SI information table. Disable the warning if not using the table.</td>
<td></td>
</tr>
<tr>
<td>CAT, DRT, ECT, MCT, NIT, PAT, PMT, SDT, or TDT warning</td>
<td>Clear</td>
<td>&lt;Input Name&gt; fault cleared</td>
<td>Message displayed when the warning is cleared.</td>
<td></td>
</tr>
<tr>
<td>CI Status</td>
<td>Set</td>
<td>Different CA Systems in Top/Bottom slots.</td>
<td>Different CA systems are used in the slots. Replace the CA cards to use the same CA system.</td>
<td></td>
</tr>
<tr>
<td>CI Status</td>
<td>Clear</td>
<td>OK</td>
<td>Message displayed when the warning is cleared.</td>
<td></td>
</tr>
<tr>
<td>Database Update Error</td>
<td>Set</td>
<td>Text 1: Database name, with one of the following: Settings, History, Access, or SI. Text 2: Data intermittent update error.</td>
<td>A single non-critical error is reported by the database. This warning is triggered by a write or insert operation. This is a minor warning. No user action is required. The warning automatically resets after 30 seconds.</td>
<td></td>
</tr>
<tr>
<td>Warning</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Causes and Remedies</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>--------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Database Update Error</td>
<td>Clear</td>
<td>Auto reset after timeout</td>
<td>Message displayed when the warning is cleared.</td>
<td></td>
</tr>
<tr>
<td>Decoder Low Memory (available on single-stream units only)</td>
<td>Set</td>
<td>Decoder, Controller, Transcoder#, or HEVC Proc# Low Memory</td>
<td>The memory use on the identified Decoder, System (Controller), Transcoder, or HEVC Processor exceeded the recommended operating threshold (70% of the physical memory). If this problem persists, or is indicated in the alarm history, contact Cisco Services.</td>
<td></td>
</tr>
<tr>
<td>Decoder Low Memory</td>
<td>Clear</td>
<td>Decoder Low Memory fault cleared</td>
<td>The condition which caused memory use on the Decoder, System (Controller), Transcoder, or HEVC Processor to exceed the recommended operating threshold has been resolved or replaced by the VeryLowMem alarm.</td>
<td></td>
</tr>
<tr>
<td>ETH REDN: Link Speed</td>
<td>Set</td>
<td>Link speed mismatch detected</td>
<td>Manually configured or auto-negotiated link speed is different for two paired Eth ports. In case of REDN-controlled switch this might trigger overflow on port with lower link speed. The condition for this fault is only monitored for &quot;auto&quot; REDN modes. Make sure the link speed on paired ETH ports are identical.</td>
<td></td>
</tr>
<tr>
<td>ETH REDN: Link Speed</td>
<td>Clear</td>
<td>Link speeds are identical (or not resolved), Link speed is not resolved, or Link speed is not monitored in manual modes</td>
<td>Message displayed when the warning is cleared.</td>
<td></td>
</tr>
<tr>
<td>Warning</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Causes and Remedies</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------</td>
<td>----------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>FPGA Temperature Warning</td>
<td>Set</td>
<td>ecc_set_fpga_temp_warn: Warning: [FPGA name]</td>
<td>The FPGA temperature is above normal operating range, due to room temperature too high or blocked air flow. Check the openings on front and rear panels for blockage. Lower the room temperature or improve air flow to the device.</td>
<td></td>
</tr>
<tr>
<td>FPGA Temperature Warning</td>
<td>Clear</td>
<td>ecc_reset_fpga_temp_warn</td>
<td>Message displayed when warning is cleared, indicating that the FPGA temperature is within the normal operating range.</td>
<td></td>
</tr>
<tr>
<td>Flash Sector Error</td>
<td>Set</td>
<td>Check setting. Counted %d events on %s. See User Manual.</td>
<td>A sector on &lt;device&gt; (Pri, Sec, Trans 1, or Trans 2) was found corrupted at power on, which was not a result of an interrupted erase. The problem happened &lt;number&gt; of times on this FLASH during a lifetime. Check if the desired application is running and if the settings are valid.</td>
<td></td>
</tr>
</tbody>
</table>
| Input<id> Program Status      | Set          | Input <id> Program Status: MoIP<id> (PEid>) <reason> | Displays the first issue found, in the following priority:  
  - PCR loss  
  - Video loss  
  - Audio 1 loss  
  - Audio 2 loss  
  - FEC1 (Columns) loss - Specific input configured with FEC Mode 1D or 2D, but FEC Columns are not detected for that input.  
  - FEC2 (Rows) loss - Specific input configured with FEC Mode 2D, but FEC Rows are not detected for that input.                                                                                                                                                                                                                                                                                                                                 |
<table>
<thead>
<tr>
<th>Warning</th>
<th>Message Type</th>
<th>Message</th>
<th>Description, with Causes and Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input&lt;id&gt; Program Status</td>
<td>Clear</td>
<td>MOIP Fault Cleared</td>
<td>Message displayed when warning is cleared.</td>
</tr>
<tr>
<td>Network ID Mismatch TSn</td>
<td>Set</td>
<td>Original Network ID in NIT and SDT mismatched</td>
<td>The original network ID in NIT does not match the original network ID in SDT. Additional error details are displayed in the log file. Ensure that the uplink is sending the same original network ID in SDT and in NIT.</td>
</tr>
<tr>
<td></td>
<td>Clear</td>
<td>Original Network ID in NIT and SDT matched</td>
<td>Message displayed when warning is cleared.</td>
</tr>
<tr>
<td>No NIT PID in PAT</td>
<td>Set</td>
<td>&lt;Input Name&gt; PAT - No NIT pid</td>
<td>PAT is missing reference to the NIT PID. Check the uplink configuration to see why a valid NIT PID is not included in PAT.</td>
</tr>
<tr>
<td></td>
<td>Clear</td>
<td>Fault Cleared</td>
<td>Message displayed when the warning is cleared.</td>
</tr>
<tr>
<td>PE License Fault</td>
<td>Set</td>
<td>Uplink Xcodeconfig dropped for PE %u as PE has no HD license</td>
<td>There are no transcode licenses available for the PE. All transcoded licenses are utilized. This occurs when an inband uplink configuration attempts to set up more PEs for transcoding than the licensing allows.</td>
</tr>
<tr>
<td>PSI/SI Stream Error TSn</td>
<td>Set</td>
<td>Cannot associate Transport Stream ID between SDT and NIT for channel N Cannot associate Transport Stream ID between PAT and NIT for channel N Cannot associate Transport Stream ID between PAT and SDT for channel N</td>
<td>There is an error in the transport stream ID for the displayed channel. Contact your uplink administrator.</td>
</tr>
<tr>
<td></td>
<td>Clear</td>
<td>No PSI/SI Stream Error detected</td>
<td>Message displayed when warning is cleared.</td>
</tr>
<tr>
<td>Warning</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Causes and Remedies</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------</td>
<td>-----------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Power Warning</td>
<td>Set</td>
<td>ecc_set_power_good_warn: warning slot #1 [#2..]</td>
<td>The voltage for one or more cards is out of range. Contact Cisco Services.</td>
</tr>
<tr>
<td>Power Warning</td>
<td>Clear</td>
<td>ecc_reset_power_good_warn</td>
<td>Message displayed when the warning is cleared.</td>
</tr>
<tr>
<td>Restore Failure Reason</td>
<td>Set</td>
<td>Not Accepted</td>
<td>Import file was rejected and import did not occur. This may be because the import file is for a different product, or the structure is not compatible with the current unit. Verify that the correct import file is being used and was created by this product, and that the file structure has not been corrupted. If the problem persists, contact Cisco Services.</td>
</tr>
<tr>
<td>Restore Failure Reason</td>
<td>Set</td>
<td>Bad Content</td>
<td>Item in import file is not valid for this software and import did not occur. This may be because the import file is corrupted, or the file is from a different version of the application software. Verify that the correct import file is being used and was created by this product, and that the file structure has not been corrupted. If the problem persists, contact Cisco Services.</td>
</tr>
<tr>
<td>Restore Operation State</td>
<td>Set</td>
<td>Restore Active</td>
<td>The restore state is displayed, for information purposes only. No action required.</td>
</tr>
<tr>
<td>Restore Operation State</td>
<td>Clear</td>
<td>Restore Complete</td>
<td>Message displayed when restore is completed.</td>
</tr>
<tr>
<td>Warning</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Causes and Remedies</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------</td>
<td>--------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Temperature Warning     | Set         | Temperature over Warning threshold | The temperature is above normal operating range, due to room temperature too high or blocked air flow.  
Check openings on front and rear panels for blockage. Lower the room temperature or improve air flow to the device. |
| Temperature Warning     | Clear       | Temperature normal       | Message displayed when warning is cleared, indicating that the temperature is within the normal operating range.                                                      |
| Transcoder Alarm        | Set         | Failed on PE(s): x,y,z    | Software is unable to initialize the transcoder chip. This is a possible hardware issue.  
Reboot the unit. If the issue is intermittent, the condition may clear after a reboot.                                                                              |
| Transcoder Alarm        | Clear       | Fault Cleared            | Message displayed when warning is cleared.                                                                                                                                 |
| Transport Error         | Set         | Continuity Count Error    | Transport packet continuity count jumped, due to a possible uplink or signal issue.  
Clear warnings, reset the unit, and notify Cisco Services if the problem persists.                                                                                   |
| Transport Error         | Set         | Transport Error Indicator | Transport packets are marked as "errored" upstream of the decoder, due to a possible uplink or signal issue.  
Clear warnings, reset the unit, and notify Cisco Services if the problem persists.                                                                                   |
<p>| Transport Error         | Clear       | Continuity Count Error Cleared or Transport Error Indicator Cleared | Message displayed when no transport input errors are detected.                                                                                                        |</p>
<table>
<thead>
<tr>
<th>Warning</th>
<th>Message Type</th>
<th>Message</th>
<th>Description, with Causes and Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unexpected PID</td>
<td>Set</td>
<td>ASI/RF/IP# -&gt; CA -&gt; PID(0)</td>
<td>The received Conditional Access Table (CAT) contains a reference to PID 0, the Program Association Table (PAT), due to an error in the received transport stream. Check your uplink settings or configuration.</td>
</tr>
<tr>
<td>Unexpected PID</td>
<td>Clear</td>
<td>Fault Cleared</td>
<td>Message displayed when the warning is cleared.</td>
</tr>
<tr>
<td>Video Format Mismatch</td>
<td>Set</td>
<td>Video format mismatch</td>
<td>The incoming stream video format is mismatched with the configured Primary Video Output format. Change the Primary Video Output format to match the incoming stream format, or choose Auto. For more information, see Setting up the Video Information, on page 85.</td>
</tr>
<tr>
<td>Video Format Mismatch</td>
<td>Clear</td>
<td>Video format match</td>
<td>Message displayed when warning is cleared.</td>
</tr>
<tr>
<td>Xcode Delay Buf Oflw</td>
<td>Set</td>
<td>PE(s): x;y;z</td>
<td>Transcoder board FPGA reports buffer overflow on delayed PID path. This is reported when the transcoding chip outputs more data than the path is capable of handling. Verify that the configured overall bit rate for 8 transcoders does not exceed the FPGA path limitation.</td>
</tr>
<tr>
<td>Xcode Delay Buf Oflw</td>
<td>Clear</td>
<td>Fault cleared</td>
<td>Message displayed when the warning is cleared.</td>
</tr>
</tbody>
</table>

### Setting up Alarms

**Step 1**  
From the D9800 web GUI, choose **System Settings > Setup** (under Alarms). Or, from the Main Menu of the D9800 front panel, choose **Setup > Alarm/Warn**.
Setting up Warnings

Step 1 From the D9800 web GUI, choose System Settings > Setup (under Alarms). Or, from the Main Menu of the D9800 front panel, choose Setup > Alarm/Warn.

Step 2 Click the Warning Setup link at the bottom of the page.

Step 3 The Warning Setup area displays all the warning messages, or select the System Warning Name front panel menu to scroll through the warnings. You can enable or disable each of the warnings, and configure the trap and relay settings. For more information, see Setting up Alarms, on page 170.

Note For more information on the front panel reminder setting, see Setting up Alarms, on page 170.

Step 4 Apply the changes.
Viewing Alarm/Warning History

From the D9800 web GUI, choose Support > Alarm History, or from the Main Menu of the D9800 front panel, choose Diagnostics > Alarms/Warnings > View History.

The Alarm History page or the View History menu displays all the past system event messages and their set and cleared dates and times. For more information on alarm and warning messages, see Alarms, on page 141 and Warnings, on page 162.

Click Clear Alarm/Warning History to clear all the messages in the Alarm History table, or from Main Menu of the D9800 front panel, choose Diagnostics > Alarms/Warnings > Clear History.

Viewing the Alarm/Warning Status

From the D9800 web GUI, choose System Settings > Status.

The Status page displays all the active event messages for the D9800 system. The Fault Summary section displays the Type of message (alarm or warning) and the number of alarms and warnings that have an active status (Number Active).

The following table shows the Alarm/Warning Status table information:

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Shows whether it is an alarm or a warning message.</td>
</tr>
<tr>
<td>Name</td>
<td>Name of the alarm or warning.</td>
</tr>
<tr>
<td>Text</td>
<td>Content of the message.</td>
</tr>
<tr>
<td>Set Since</td>
<td>Date and time of the alarm or warning.</td>
</tr>
</tbody>
</table>

Click Clear Alarms/Warnings to clear all the messages in the Alarm/Warning Status table.
# Default Settings

This section lists the factory default settings for the Cisco D9800 Network Transport Receiver.

- [DPM Default Settings for Different Output Modes](#) on page 173

## DPM Default Settings for Different Output Modes

The DPM parameters are preset to default settings for each DPM Output Mode.

The default settings for particular Output modes have been preset to optimize the output when PID mapping is required. The fields labeled “Any” in the table below are not used, in which case, the Output Mode will not change if the parameter is changed.

<table>
<thead>
<tr>
<th>Output Mode</th>
<th>No Output</th>
<th>Passthrough</th>
<th>Service Chans Only</th>
<th>MAP Passthrough</th>
<th>MAP Svc Chans Only</th>
<th>Transcoding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate Control</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
</tr>
<tr>
<td>User Rate</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
</tr>
<tr>
<td>Descramble Mode</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Descrambled</td>
</tr>
<tr>
<td>Regenerate</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
</tr>
<tr>
<td>Insert Null Packet</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
</tr>
<tr>
<td>Map Mode</td>
<td>Any (not used)</td>
<td>Svc ID</td>
<td>Svc ID</td>
<td>Svc ID &amp; PID</td>
<td>Svc ID &amp; PID</td>
<td>SVC ID &amp; PID</td>
</tr>
<tr>
<td>Duplic Mode</td>
<td>Any (not used)</td>
<td>PSI Remap</td>
<td>PSI Remap</td>
<td>Pkt Copy</td>
<td>Pkt Copy</td>
<td>Pkt Copy</td>
</tr>
<tr>
<td>Output Mode</td>
<td>No Output</td>
<td>Passthrough Service Chans Only</td>
<td>MAP Passthrough</td>
<td>MAP Svc Chans Only</td>
<td>Transcoding (multi-stream unit only, with a transcoder card)</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>--------------------------------</td>
<td>----------------</td>
<td>-------------------</td>
<td>-------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Unref</td>
<td>Drop</td>
<td>Pass</td>
<td>Drop</td>
<td>Pass</td>
<td>Drop</td>
<td></td>
</tr>
<tr>
<td>PSI Options</td>
<td>Drop</td>
<td>Ctrl By Table</td>
<td>Ctrl By Table</td>
<td>Ctrl By Table</td>
<td>Ctrl By Table</td>
<td></td>
</tr>
<tr>
<td>PSI Rate</td>
<td>Any (not used)</td>
<td>SA Std</td>
<td>SA Std</td>
<td>SA Std</td>
<td>SA Std</td>
<td></td>
</tr>
<tr>
<td>Svc ID</td>
<td>Any (not used)</td>
<td>Valid Ch</td>
<td>Valid Ch</td>
<td>Valid Ch</td>
<td>Valid Ch</td>
<td></td>
</tr>
<tr>
<td>PAT</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>Regen</td>
<td>Regen</td>
<td>Regen</td>
<td></td>
</tr>
<tr>
<td>CAT</td>
<td>Not Displayed</td>
<td>If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass</td>
<td>If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass</td>
<td>If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass</td>
<td>Regen</td>
<td></td>
</tr>
<tr>
<td>PMT</td>
<td>Not Displayed</td>
<td>If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass</td>
<td>If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass</td>
<td>Regen</td>
<td>Regen</td>
<td></td>
</tr>
<tr>
<td>TSDT</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>NIT</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>Regen</td>
<td>Regen</td>
<td>Regen</td>
<td></td>
</tr>
<tr>
<td>NITO</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>PwRc</td>
<td>PwRc</td>
<td>Drop</td>
<td></td>
</tr>
<tr>
<td>SDT</td>
<td>Not Displayed</td>
<td>If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass</td>
<td>Regen</td>
<td>Regen</td>
<td>Regen</td>
<td></td>
</tr>
</tbody>
</table>
The following table contains values passed to the DPM:

<table>
<thead>
<tr>
<th>Output Mode</th>
<th>SPTS Service Chans Only</th>
<th>SPTS MAP Svc Chans Only</th>
<th>SPTS Transcoding (multi-stream unit only, with a transcoder card)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map Mode</td>
<td>Svc ID &amp; PID</td>
<td>Svc ID &amp; PID</td>
<td>Svc ID &amp; PID</td>
</tr>
<tr>
<td>Duplic Mode</td>
<td>Pkt Copy</td>
<td>Pkt Copy</td>
<td>Pkt Copy</td>
</tr>
<tr>
<td>Unref</td>
<td>Drop</td>
<td>Drop</td>
<td>Drop</td>
</tr>
<tr>
<td>PSI Options</td>
<td>Ctl By Table</td>
<td>Ctl By Table</td>
<td>Ctl By Table</td>
</tr>
<tr>
<td>PSI Rate</td>
<td>SA Std</td>
<td>SA Std</td>
<td>SA Std</td>
</tr>
<tr>
<td>Svc ID</td>
<td>Valid Ch</td>
<td>Valid Ch</td>
<td>Valid Ch</td>
</tr>
<tr>
<td>PAT, CAT, PMT, SDT</td>
<td>Regen</td>
<td>Regen</td>
<td>Regen</td>
</tr>
</tbody>
</table>
## Default Settings

<table>
<thead>
<tr>
<th>Output Mode</th>
<th>SPTS Service Chans Only</th>
<th>SPTS MAP Svc Chans Only</th>
<th>SPTS Transcoding (multi-stream unit only, with a transcoder card)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSDT, NIT, NITO, SDTO, BAT, RST, DIT, SIT, EMM, DRT, CDT</td>
<td>Drop</td>
<td>Drop</td>
<td>Drop</td>
</tr>
<tr>
<td>EIT, TOT</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>TDT</td>
<td>Pass</td>
<td>Drop</td>
<td>Pass</td>
</tr>
<tr>
<td>ECM</td>
<td>If Descramble Mode is set to Descrambled, it is set to Drop; otherwise, it is set to Pass</td>
<td>If Descramble Mode is set to Descrambled, it is set to Drop; otherwise, it is set to Pass</td>
<td>If Descramble Mode is set to Descrambled, it is set to Drop; otherwise, it is set to Pass</td>
</tr>
<tr>
<td>PE Action (all PEs)</td>
<td>Pass</td>
<td>Map</td>
<td>XCode</td>
</tr>
</tbody>
</table>
Compliance

This section contains the compliance information for the D9800 Network Transport Receiver.

- Applicable Standards and Notices, on page 177
- Declaration of Conformity, on page 179

Applicable Standards and Notices

Safety

The D9800 Network Transport Receiver has been approved for safety to the requirements the Standards Council of Canada and OHSA (NRTL) to the following standards:

CAN/CSA 60065:16 - Audio, Video and Similar Electronic Apparatus - Safety Requirements
UL Std No. 60065-2015 - Audio, Video and Similar Electronic Apparatus - Safety Requirements

Also, this product has been evaluated under the IECEE CB scheme to the following international standard:


EMC

Electrostatic Discharge (ESD) results from the static electricity buildup on the human body and other objects. This static discharge can degrade components and cause failures.

Take the following precautions against electrostatic discharge.

Use an anti-static bench mat and a wrist strap or ankle strap designed to safely ground ESD potentials through a resistive element.

Keep components in their anti-static packaging until installed.

Avoid touching electronic components when installing a module.
Electromagnetic Compatibility Regulatory Requirements

Ethernet cables should be of single-shielded or double-shielded type. Coaxial cables should be of the double-braided shielded type. Where this equipment is subject to USA FCC and/or Industry Canada rules, the following statements apply:

FCC Notices

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions supplied in this manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (which can be determined by turning the equipment off and on), the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the television receiving antenna.
2. Increase the separation between the equipment and the receiver.
3. Connect the equipment to an AC outlet on a circuit different from that to which the receiver is connected.
4. Contact your dealer/reseller or an experienced radio/TV technician for help.

The user may find the booklet “Interference handbook” prepared by the Federal Communications Commission helpful. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, stock no. 004-000-00450-7.

Shielded cables should be used to interconnect this device with any other/peripheral equipment (for example, data sources, terminals, monitors, and so on) to ensure compliance with Class B limits. Failure to do so may result in radio or TV interference. Cables should be of braided shield construction with metal end shells.

Industry Canada Notice

This digital apparatus does not exceed the limits for Class B radio noise emissions from digital apparatus as set out in the radio interference regulations of the Industry Canada.

Le present appareil numerique n’émet pas de bruites radioelectriques qui dépassant les limites applicables aux appareils numeriques de Class B prescrites dans le reglement sur le brouillage radioelecctrique edicte par Industrie 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

Cisco Systems Inc. & all its affiliates
Headquarter at:
170 West Tasman Drive
San Jose, CA 95134
USA

Declare under sole responsibility that the product,

Brand: Cisco
Description: Chassis and cards

Model:
D9900-MG-S1, D9900-ANALOG, D9900-DV/R-C1, D9900-HEVC-REC, D9900-MG-MPEG28, D9900-
SAT-GSM1, D9900-ES-BASIC, D9900-ES-MPEG28, D9900-TX8

Fulfills the essential requirements of the following Directives: 2014/30/EU and 2014/35/EU and is in
conformity with Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical
and electronic equipment

The following standards were applied:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>EN/50082-1:2004</td>
<td>EN/50082-1:2004</td>
<td>EN/50082-1:2004</td>
</tr>
<tr>
<td>Environmental</td>
<td>EN/62620-1:2013</td>
<td>EN/62620-1:2013</td>
<td>EN/62620-1:2013</td>
</tr>
</tbody>
</table>

EN are relevant harmonized standards.

Date & Place of issue: 21/FEB/17, San Jose

Signature: 

Tony Youssef
Director, Technology Standards
Corporate Compliance

EU Authorized Representative:

Edgard Vandez
Cisco Systems Belgium
De Krekelaan, 6A
B-1831 Diegem - Belgium

DeCIS/56455, Rev 2