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The following information is for FCC compliance of Class B devices: 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 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, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If the equipment causes interference to radio or television reception, which can be determined by turning the equipment off and on, users are encouraged to try to correct the interference by using one or more of the following measures:

- 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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IMPORTANT SAFETY INSTRUCTIONS

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.

![Antenna Grounding Diagram]

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>
</table>
| ⚠️ | You will find this symbol on the product and/or in the literature that accompanies this product.  
It indicates important operating or maintenance instructions. |
| ⚠️ | You may find this symbol on the product and/or in the literature that accompanies this product.  
It indicates a live terminal; the symbol pointing to the terminal device. |
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'ayez pas entièrement assimilé les conditions indiquées par un symbole!

<table>
<thead>
<tr>
<th>Symbole</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbole 1]</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>![Symbole 2]</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>![Symbole 3]</td>
<td>Ce symbole peut être attaché à ce produit. Il indique une borne de terre de protection.</td>
</tr>
<tr>
<td>![Symbole 4]</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'ouvrez 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 Ausführungsnormen. Beachten Sie alle in diesem Handbuch enthaltenen Sicherheitshinweise sowie die am Gerät angebrachten Warnzeichen.

• Sollten örtliche Umstände den sicheren Betrieb dieses Gerätes beeinflussen, schalten Sie es ab und sichern Sie 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>Erläuterung</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Warnsymbol" /></td>
<td>Dieses Symbol erscheint auf dem Gerät und/oder in der ihm beiliegenden Literatur. Es bedeutet wichtige, zu beachtende Betriebs- oder Wartungsanweisungen.</td>
</tr>
<tr>
<td><img src="image" alt="Warnsymbol" /></td>
<td>Wenn dieses Zeichen am Gerät angebracht ist, warnt es vor einer spannungsführenden Stelle.</td>
</tr>
<tr>
<td><img src="image" alt="Warnsymbol" /></td>
<td>Dieses Symbol kennzeichnet auf dem Gerät die Anschlußstelle der Sicherheitserde.</td>
</tr>
<tr>
<td><img src="image" alt="Warnsymbol" /></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 linea principal, utilice el cordón toma de corriente para este propósito.
Cubierta

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

Cables

- Siempre desconecte 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>!</td>
<td>Questo simbolo, che appare nella letteratura di accompagnamento del prodotto, indica importanti istruzioni d'uso e di manutenzione.</td>
</tr>
<tr>
<td>⚠️</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>🔐</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>🔥</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.

Riparaziono 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>3.75</td>
<td>October 2018</td>
<td>Added Search Path Status parameter to the Viewing the Disaster Recover Status section, modified Protocol Control area location (Step 1) in the Configuring the Remote Access Protocols section, added Reset button information in the Viewing the CAM Menu Options section, modified the RF input and added the ASI and ABR inputs to the Disaster Recovery section, modified Certificate Error of the Last Error field in the Viewing the Zixi Input Status section, modified Step 3 in the Setting up Alarms section, and added DR RF Tuning Mismatch warning in the Warnings section.</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>
</tbody>
</table>
Indication

Optional alternative keywords are grouped in brackets and separated by vertical bars.

A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Terminal sessions and information the system displays appear in courier font.

Nonprinting characters such as passwords are in angle brackets.

Default responses to system prompts are in square brackets.

An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

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


- *Open Source Used In Cisco D9800 Network Transport Receiver*, available at the following URL: http://www.cisco.com/go/receivers_licensing.

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 (.setImageResource(6)), 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</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>no external LNB power source is available. RF2 to RF4 require an external</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LNB power source.</td>
<td></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</td>
<td></td>
</tr>
<tr>
<td></td>
<td>installed (D9800-3G-SDI).</td>
<td></td>
</tr>
<tr>
<td>AUD 1&amp;2 and AUD 3&amp;4 (Balanced</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>Connector</td>
<td>Description</td>
<td>Type</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
</tbody>
</table>
| CVBS (Composite Video Output) | 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.                | BNC                         |
| HDMI                         | The HDMI output is for monitoring purposes only.                            | HDMI Type A receptacle (female) |
| ASI IN and ASI OUT (D9800-SS) | 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. | BNC                         |
| ASI I/O 1 and ASI I/O 2 (D9800-MS) |                                                                                 |                             |
| Cue Tone/Cue Trigger          | 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.                | 15-pin sub-D female         |
| USB                          | This is not supported in the current release.                               |                             |
| Management                    | Supports the following network protocols: SSH, HTTPS, SNMP, Syslog, and NTP. | RJ-45                       |
| DATA1 and DATA2 (D9800-SS)    | 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.  
                               | 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).  
                               | 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.  
                               | 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. | RJ-45                       |
| DATA1 to DATA4 (D9800-MS)     |                                                                                           |                             |
| Ground/Earth                  | A grounding/earthing point for the receiver for equipotential bonding (not Safety). | Nut on Stud                 |
| Power                        | Connects the receiver to an AC power source.                                  | Receptacle: IEC 60320 Sheet 14 |
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.
Connect digital audio output broadcast equipment to the AES-3id connectors. The two stereo channels are useful for Dolby Digital 5.1 pass-through applications. Use a high-quality, double-shielded RG6 coaxial cable.

**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.

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</td>
<td>11</td>
<td>10</td>
<td>15</td>
<td>Trigger</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>10</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>Pin</th>
<th>Pin Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cue Trig 1</td>
</tr>
<tr>
<td>2</td>
<td>Cue Trig 2</td>
</tr>
<tr>
<td>3</td>
<td>Cue Trig 3</td>
</tr>
<tr>
<td>4</td>
<td>Cue Trig 4</td>
</tr>
<tr>
<td>5</td>
<td>Cue Trig 5</td>
</tr>
<tr>
<td>6</td>
<td>Cue Trig 6</td>
</tr>
<tr>
<td>7</td>
<td>Cue Trig 7</td>
</tr>
<tr>
<td>8</td>
<td>Cue Trig 8</td>
</tr>
<tr>
<td>9</td>
<td>Not connected</td>
</tr>
<tr>
<td>10</td>
<td>Alarm/Relay - Common</td>
</tr>
<tr>
<td>11</td>
<td>Alarm/Relay - Normally open</td>
</tr>
<tr>
<td>12</td>
<td>Chassis ground</td>
</tr>
<tr>
<td>13</td>
<td>Cue Tone-</td>
</tr>
<tr>
<td>14</td>
<td>Cue Tone +</td>
</tr>
<tr>
<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 UI, 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 UI 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>![Checkmark]</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>![Document]</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>![Pen]</td>
<td>The ISE block signature is validated.</td>
</tr>
<tr>
<td>![Error]</td>
<td>The ISE block validation has failed or is missing.</td>
</tr>
</tbody>
</table>
CHAPTER 2

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 UI, 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 UI 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 UI, 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>
<tr>
<td>Menu Item</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| 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 UI 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 UI (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.
Getting Started

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

- About the Front Panel, on page 15
- Logging on to the D9800 Web UI, 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 UI.

**Step 1** From the D9800 web UI, 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*

The table below describes the parameters displayed on the 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</td>
</tr>
<tr>
<td></td>
<td>PowerVu channels to PE2 to PE32. If any PowerVu channels are assigned to</td>
</tr>
<tr>
<td></td>
<td>PE2 to PE32, all Service PIDs associated with these channels will be dropped</td>
</tr>
<tr>
<td></td>
<td>from the transport output.</td>
</tr>
<tr>
<td></td>
<td>Multi-Stream unit: All 32 PEs support PowerVu descrambling. You may need</td>
</tr>
<tr>
<td></td>
<td>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
```

The table below describes the symbols.

<table>
<thead>
<tr>
<th>LCD Symbol</th>
<th>Description</th>
</tr>
</thead>
</table>
| ✗          | 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. |
| ✋         | Indicates that the INFO key is active. In most cases, this will display contextual information on the LCD screen. |
| ✌         | Indicates that the SELECT key is active. |
| 🔄         | 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. |
### LCD Symbol | Description
--- | ---
פסיק | 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. **Note** Service interruption occurs during a reboot, which is always required during a software update.
수정 | The Download symbol indicates that a software download for a version of software already in memory has been detected.
재해, | The Disaster Recovery (DR) symbol indicates that a disaster is declared on the current receiver.
스케줄 | The NIT Retune (NR) symbol indicates that a NIT retune recovery is in progress on the current receiver.
| The Session Open symbol indicates that you are changing a group of related items.

### 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 UI

**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 UI. For more information on the HTTP setting, see Configuring the Remote Access Protocols, on page 140.
**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 UI.

## 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.

### Step 1
From the D9800 web UI, choose **System Settings > Account Management**.

### Step 2
In the **Enter Current Password** field, type the current login password.

### Step 3
In the **Enter New Password** field, type the new login password.

### Step 4
In the **Re-enter New Password** 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.

### Step 5
Click **Apply**.

## D9800 Web UI Environment

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

<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 UI 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 UI.

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 UI.
The switch affects all pages, not only the current page.

The following is a list of features that are NOT included in the Basic mode:

- AFC Limit, Input Selection, Polarisation, Orbital Posn, and East/West Flag options in **RF Input Selection** area of the RF Input Setup page.

- Muting Threshold, Disaster Recovery, Disaster Recovery Status, Channel Selection, Cue Tone (single-stream only), and Decode Enable (single-stream only) menu options.

- CI Component Setup in CI Setup page.

## 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 41, Tuning to the ASI Input, on page 47, Tuning to the MPEGoIP Input, on page 50, or Tuning to the ABR Input, on page 57</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 77</td>
<td>Assign a program channel to a program entry.</td>
</tr>
<tr>
<td>Configuring the ASI or MPEGoIP Output General Settings, on page 113 and Configuring the ASI or MPEGoIP Output Mode, on page 114</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>
<tr>
<td>Configuring the SDI Outputs, on page 97</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>Task</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Configuring the ASI or MPEGoIP Output General Settings, on page 113 and Configuring MPEG over IP or IP Data Streams, on page 132</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 124</td>
<td>Set the DPM mode.</td>
</tr>
</tbody>
</table>
CHAPTER 4

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 UI 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 38
- Viewing Diagnostic Logs, on page 38
- Exporting Debug Support Data, on page 38
- SSH Access for D9800 Support, on page 39

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 UI Accounts

You can define up to 10 usernames/passwords for login use via the web UI.

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 into the D9800 web UI 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,</td>
</tr>
<tr>
<td></td>
<td>Itaics, atlsci, icslta, or any string achieved by full or partial</td>
</tr>
<tr>
<td></td>
<td>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,</td>
</tr>
<tr>
<td></td>
<td>Itaics, atlsci, icslta, or any string achieved by full or partial</td>
</tr>
<tr>
<td></td>
<td>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 UI 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 UI.

**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 UI 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.
### 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 UI, choose **System Settings > Lock Level Settings** and click **Change Lock Level**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Admin**.
**Administrative Settings**

**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.

---

**Rebooting the D9800 Receiver**

---
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 UI, 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 UI, 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 UI 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 Clear Reset Counter, or select the Clr Rst # 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 Pwoff</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 UI (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 UI, 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 UI, 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 UI, choose Support > Service Actions.
Step 2 In the **APP/License Downloads** area, click **Browse** and choose the new software license file.

Step 3 Click **Download** to download the selected license file. You must wait approximately 100 seconds before you can view the updated license information. For more information on viewing the licenses, see Viewing Hardware Features and Software License Information, on page 34.

### 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 UI, 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 UI, 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 Time 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** In the System Time area, the System Time Source field displays the current source of the system time (NTP, TDT:<source>, or Once Upon A Time), and the Current System Time/Date field displays the current date and time, based on the current source.

You may optionally configure the following:
• Check **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.

  • 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.

  • The **NTP Status** field displays the current connection status. The following is a list of the possible statuses:

    • Disabled - The **Enable NTP Time Service** check box is unchecked and disabled.

    • Attempting to Synchronize - The system is attempting to connect to the NTP server, based on the NTP server address and the NTP Time Service enabled.

    • Synchronized - The system is connected to the NTP server.

• Check the **Use TDT Time Service** check box to use the current Time and Date Table (TDT) from the transport stream. For multi-stream units, the TDT used is the lowest PE that has a TDT. If **Use NTP Time service** is also checked, NTP is used as the system time first, and TDT is used if NTP is disabled or fails to synchronize.

  **Note** If both TDT and NTP are enabled and synchronized, the following is the order of priority for determining the system time: NTP, TDT, Once Upon A Time

**Step 6**  Apply the changes.

---

**Viewing the System Version Information**

From the D9800 web UI, 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 UI, 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 UI, 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 UI, 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 41
• Tuning to the ASI Input, on page 47
• MPEG IP Input, on page 49
• Tuning to the ABR Input, on page 57
• Tuning to the Zixi Input, on page 60
• Viewing the Current Input Status, on page 64
• Setting Up the Tuning Information, on page 66
• Disaster Recovery, on page 68
• Setting Up Muting Thresholds Controls, on page 75
• Assigning a Channel to a Program Entry, on page 77
• Viewing Incoming Stream Details, on page 81
• Configuring the Common Interface (CI) Information, on page 84
• Setting up the BISS Mode, on page 87
• Viewing the Conditional Access Status, on page 87

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 71. For more information on disaster recovery, see Disaster Recovery, on page 68.
Step 1
Do one of the following:

- Web UI: From the D9800 web UI, 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 RF1, Use RF2, Use RF3, and/or Use RF4** 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 42 and Setting the RF LNB Configuration, on page 44.

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 77. 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 71. For more information on disaster recovery, see Disaster Recovery, on page 68.

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

- Web UI: From the D9800 web UI, 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

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 71. For more information on disaster recovery, see Disaster Recovery, on page 68.

Step 1
Do one of the following:

- Web UI: From the D9800 web UI, 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.

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: 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.
Reacquiring the RF Input Network Information

There are two methods to reacquiring the network: web UI and front panel. To reacquire the network using the web UI, 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 UI, 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 41.
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 UI, 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 UI field</th>
<th>Front Panel menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dnlk Freq (GHz)</td>
<td>Active</td>
<td>The current downlink frequency, in GHz.</td>
</tr>
</tbody>
</table>
### Configuring the Input Information

<table>
<thead>
<tr>
<th>Web UI field</th>
<th>Front Panel menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<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>
<tr>
<td>Signal Status</td>
<td>RF 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>AFC (MHz)</td>
<td>AFC (MHz)</td>
<td>Indicates the current Automatic Frequency Control count, in MHz.</td>
</tr>
<tr>
<td>Modulation Type</td>
<td>Modulation</td>
<td>Indicates the modulation type for the received signal (N/A, QPSK, 8PSK, DVB-S, DVB-S2 or 16QAM).</td>
</tr>
<tr>
<td>Pol</td>
<td></td>
<td>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).</td>
</tr>
<tr>
<td>IQ Tuner</td>
<td></td>
<td>Indicates the IQ (Input Signal Inversion) for the received signal (Inv or NonInv).</td>
</tr>
<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>
</tbody>
</table>
### Web UI field | Front Panel menu | Description
---|---|---
PV BER | PVBER | Indicates the PV (Post-Viterbi) BER for the received signal (DVB-S).
LDPC ER | LDPCBER | Indicates the LDPC (Low Density Parity Check) error rate for the received signal (DVB-S2).
— | UEC | Indicates the current Uncorrected Error Count for the received signal.
— | CEC | Indicates the current Corrected Error Count for the received signal (DVB-S).
— | Clear Counts | Select this option to clear the error counters.
RF1 (Power) | — | Displays the power output of RF1 to the external Low Noise Block (LNB).
LNB Status | LNB Stat | Indicates the current Low Noise Block (LNB) connection status (No Load, Over Loaded, Over Temperature, Short Circuit, Disabled, Normal, or N/A).
C/N Margin (dB) | C/N Margin (dB) | 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.
Signal Level (dBm) | Level (dBm) | Indicates the signal level of the received signal, in dBm.
— | Polar | Indicates the polarity of the LNB Power supply (Off, 13V, or 18V).
— | LO Select | Indicates whether a 22 kHz tone is available on input port RF1. This is applicable for dual-band applications (On or Off).

### 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.

**Step 1** From the D9800 web UI, 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.
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.

**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 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 UI and front panel. To reacquire the network using the web UI, 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 UI, 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 47.

**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 UI**: From the D9800 web UI, 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 currentASI input status information displayed.

<table>
<thead>
<tr>
<th>Web UI 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>
<tr>
<td>Acquisition State</td>
<td>—</td>
<td>Displays Full if the SI and PSI tables have all been found.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Otherwise, it will display Partial if there are missing tables or None if no SI or PSI tables have been found.</td>
</tr>
<tr>
<td>Input Activation Status</td>
<td>Active</td>
<td>Indicates whether the current ASI input is activated (Yes or No).</td>
</tr>
<tr>
<td>Packet Error</td>
<td>—</td>
<td>Indicates the packet error rate of the current stream.</td>
</tr>
</tbody>
</table>

**MPEGoIP Input**

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 showing the D9800 receiver receiving MPEGoIP transport streams]

**Tuning to the MPEGoIP Input**

The MPEoIP 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.

**Step 1**
From the D9800 web UI, 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 53.

**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 50 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 UI, 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 50.

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.
- **UserCfg** - 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 UI, 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 UI, 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.
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.

**Step 1** From the D9800 web UI, 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.
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 UI, choose Input > Input Setup, click the 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 Redundancy Settings.

Step 3
In the Redundancy Configuration area, check the Enable check box, or choose Yes from the Redn Enable front panel menu, to allow the primary port to failover to the backup port if one or more of the selected triggers occur. The backup port is the port that is not used as the primary port. For example, if DATA 1 is used as the primary port, DATA 2 is the backup port.

Step 4
From the Type drop-down list, or the Redn Type front panel menu, choose one of the following redundancy direction:

<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 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>Legacy 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, 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>
</tbody>
</table>

Cisco D9800 Network Transport Receiver Version 3.75 Installation and Configuration Guide
### Option | Description
--- | ---
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.

- **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.

---

**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 50.

**Step 6** Apply the changes.

---

### Reacquiring the IP Input Network Information

There are two methods to reacquiring the network: web UI and front panel. To reacquire the network using the web UI, 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 UI, 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 50.

**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 UI, 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 UI 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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(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 UI, 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 UI 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>
<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>
</tbody>
</table>
### Front Panel Menu

<table>
<thead>
<tr>
<th>Web UI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 72.  
  • 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 Data2 Host | Displays the source/host IP address of the originator. |
| — | Data1 Type and Data2 Type | Displays the encapsulation type of transport stream received from the DATA1 and DATA2 ports (UDP or RTP). |
| PCR Lock | PCR Lock | Indicates whether the system is locked to the required PCR PID (Yes or No). |
| De-jitter Latency (msec) | DejLatency | Displays the overall transport stream buffer latency, in milliseconds. |
| Packet Error | — | Indicates the packet error rate of the current stream. |
| — | IP1 Signal | Displays the link status of the active data port (Up or Down). |
Viewing the FEC Status

From the D9800 web UI, 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 UI 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 UI, 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 58 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 UI, 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 57.

**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 143.

**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 UI and front panel. To reacquire the network using the web UI, 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 UI, 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 57.

**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 UI, 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 UI Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| Signal Status (or Lock for front panel) | 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. |
| TS Rate (Mbps)               | Displays the current bit rate of the ABR stream, in Mbps.                    |
| Acquisition State           | 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. |
| DL Rate (Mbps)              | Displays the average fragment download rate, in Mbps.                        |
| Actual Latency              | Displays the actual delay, in milliseconds, added from the edge of live.  
  This is used in combination with the Target Latency setting. |
### 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 UI Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<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 UI, 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 143.

**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.

**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 8**  
Click **Save**.

### 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.
Step 1
From the D9800 web UI, 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 60.

Step 8
In the Password field, enter the password of the redundant input/output stream from the Zixi Broadcast backup server. The password is per stream and it is obtained from the Zixi Broadcaster.

Note: You cannot connect to a password-protected stream without the correct password.

Step 9
In the Decryption Key field, enter the decryption key from the backup Zixi Broadcaster UI. It supports decryption of AES-128, AES-192, and AES-256 encrypted streams.

You can still connect to an AES-encrypted stream, without the decryption key. However, you will end up with scrambled stream content.

Step 10
Click Apply.

Viewing the Zixi Input Redundancy Status

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

The following table describes the redundancy status information displayed:

<table>
<thead>
<tr>
<th>Web UI 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>
</tbody>
</table>
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.

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

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

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

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

### Step 4
In the **Latency** field, enter the latency time, in ms, to create a buffer for improved performance. However, increasing the latency may cause performance issues on the D9800 receiver.

### Step 5
In the **FEC Overhead (%)** field, enter the FEC overhead percentage, over the source bit rate.

### Step 6
In the **Password** field, enter the password of the primary input/output stream from the Zixi Broadcast server. The password is per stream and it is obtained from the Zixi Broadcaster.

**Note**  
You cannot connect to a password-protected stream without the correct password.

### Step 7
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 8
Click **Apply**.

---

Reacquiring the Zixi Input Network Information

There are two methods to reacquiring the network: web UI and front panel. To reacquire the network using the web UI, 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 UI, 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 60.

### 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 UI, 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 UI Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signal Status</strong></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><strong>DR Status</strong></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 72.</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><strong>Rate (Mbps)</strong></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>Acquisition State</strong></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>
</tbody>
</table>
### Web UI Field | Description
---|---
**Last Error** | Displays the error that occurred during the last Zixi connection. The following is a list of the possible errors:
- Connection timeout - Connection to the Zixi server timed out.
- Authorization failed - Stream password is incorrect or not provided.
- Decryption error - AES decryption key is missing or incorrect.
- Certificate Error - An error has occurred while validating the DTLS certificate on the Zixi broadcaster. For example, certificate has expired or server did not send any certificate.
- Bad URL - Invalid Zixi source, port, or stream ID.
- Can't resolve hostname - Hostname cannot be resolved under the current DNS configuration.
- Stream not found - Stream does not exist on the Zixi Broadcaster.

**Current Intf** | Displays the current redundancy port.

**Current Source** | Displays the IP address or host name of the Zixi server.

**ARQ Recovered** | Displays the number of dropped packets recovered through ARQ.

**FEC Recovered** | Displays the number of FEC packets recovered.

**Not Recovered** | Displays the number of non-recovered packets.

**Packet Error** | Indicates the packet error rate of the current stream.

---

**Viewing the Current Input Status**

**Step 1**  
From the D9800 web UI, 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>Web UI Field</th>
<th>Front Panel Menu</th>
<th>Description</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>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>
<tr>
<td></td>
<td></td>
<td><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 71. For more information on disaster recovery, see Disaster Recovery, on page 68.

---

**Step 1** From the D9800 web UI, 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 67.

**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 UI, 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 UI, 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 UI 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>
</tbody>
</table>
## Web UI Menu | Front Panel Menu | Description
--- | --- | ---
Source of Last tuning | Tune Reason | Indicates how the tuning parameters were last saved.

| Acquisition State | Acquisition State | 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. |
--- | --- | ---

| TS ID | TxID | Displays the transport ID number (1 to 65535). |
--- | --- | ---

| Net ID | NetID | 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. |
--- | --- | ---

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

| BAT, NIT, SDT, and PAT | BAT, NIT, SDT, and PAT | Indicates whether the NIT, SDT, and PAT are being used to create the service list. |
--- | --- | ---

### Note
BAT is not supported in the current release.

---

## 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.

- **Single-stream units** - If a failure occurs on an active RF input, it can only tune to another RF input, depending on the search path defined. If a failure occurs on an active MOIP, Zixi, ASI, or ABR input, it can tune to another MOIP, Zixi, ABR, or RF input, depending on the search path defined.

- **Multi-stream units** - If a failure occurs on an active RF, MOIP, Zixi, ASI, or ABR input, it can tune to another RF, MOIP, Zixi, ASI, or ABR 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 72, and [Viewing the Disaster Recovery Status](#), on page 74.

### 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 UI 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 41.

---

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 PE1 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, Zixi, ASI, or ABR Input Disaster Recovery

The MOIP, Zixi, ASI or ABR 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 UI 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 77.

The table below is an example of a disaster recovery search path. 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 71.

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 801 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 50), or restore a previous backup file.

**NIT Retune Recovery**

---

**Note**

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 74). 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 UI, choose **Input > Disaster Recovery**.

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

**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 (RF, MOIP, ASI, ABR, or Zixi).

**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 42 for RF parameters, *Configuring the MPEG over IP Input*, on page 50 for MOIP parameters, *Tuning to the Zixi Input*, on page 60 and *Configuring the Zixi Advanced Settings*, on page 62 for Zixi parameters, *Tuning to the ASI Input*, on page 47 for ASI parameters, or *Configuring the ABR Input*, on page 58 for ABR 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 68. 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 77.

Disaster Recovery supports up to three backups.

The **Search Path Status** area displays the current status of the search path if a disaster recovery is in progress. For details, see *Viewing the Disaster Recovery Status*, on page 74.

---

**Step 1**  From the D9800 web UI, 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 71.

**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.

**Note**

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 71](#). For more information on disaster recovery, see [Disaster Recovery, on page 68](#).

---

**Step 1**  From the D9800 web UI, 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.

**Note**  Although 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 72](#).

**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.
Tuning to a Channel in Search Path Manually

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

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

Step 2
In the **Search Path** area, click the radio button of the search path you want to manually set to a different channel.

Step 3
Click **GOTO**.

Step 4
From the **Tuning Selection** drop-down list, choose the backup node, as defined in Backup 1, 2, or 3 ID. The backup node is associated with a backup channel. Choose Origin if a disaster recovery is currently in progress and you would like to manually tune to the origin input and channel.

Step 5
Click **Apply**.

Viewing the Disaster Recovery Status

Note
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 UI, choose **Input > Disaster Recovery Status**.

The **State** field displays the current disaster recovery status. The table below lists the possible statuses.

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Disaster - D/R Ready</td>
<td>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).</td>
</tr>
<tr>
<td>D/R in progress</td>
<td>The unit has detected a loss of input and if the <strong>Configured By</strong> field displays User, it searches for a backup transport using the configured search path. The configured search path is displayed in the <strong>Backup Transport</strong> area.</td>
</tr>
<tr>
<td>D/R disabled - Maintenance Mode</td>
<td>The disaster recovery feature is disabled. The unit is in maintenance mode. To enable disaster recovery, see Enabling the Disaster Recovery Settings, on page 73.</td>
</tr>
<tr>
<td>NIT Retune Recovery in progress</td>
<td>The NIT retune recovery is in progress. For more information on NIT retune, see NIT Retune Recovery, on page 71.</td>
</tr>
</tbody>
</table>

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 Table** 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**. For details on the settings, see Adding a Backup Node, on page 71.

The **Search Path Status** area displays the current status of the search path if a disaster recovery is in progress. The following table displays the status information:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>Displays the name of the input that the unit is actively recovering during disaster recovery. If no disaster recovery is in progress, None is displayed. For example, RF1 input has failed, triggering disaster recovery. The Input status displays RF1 until the unit successfully tunes to the next backup transport, based on the search path configured. Once the unit successfully tunes to the next backup transport, the Input status changes to None.</td>
</tr>
<tr>
<td>Tuning Source</td>
<td>Displays the current source of the input that the unit is actively recovering during disaster recovery. The possible statuses are: Origin, Backup 1, Backup 2, or Backup 3. If there is no disaster recovery in progress, N/A is displayed.</td>
</tr>
<tr>
<td>State</td>
<td>Displays the current state of the input the unit is actively recovering during disaster recovery. The possible states are: Searching, Tuning to a signal, Locking signal, Acquiring signal, Switching channel, or Locking channel. If there is no disaster recovery in progress, N/A is displayed.</td>
</tr>
<tr>
<td>Pending Instances (Input)</td>
<td>Displays the number of inputs pending processing during disaster recovery (0 to 32). If multiple inputs are in a failed state during disaster recovery, the inputs are processed one at a time, and in the order of failure.</td>
</tr>
<tr>
<td>Next Instance (Input)</td>
<td>The name of the input that is next to be processed during disaster recovery. If there are no pending inputs, None is displayed.</td>
</tr>
</tbody>
</table>

The **Search Path** area displays the backup node and the channel numbers assigned to the Origin and Backup transports for PE1 to PE16. For details on the settings, see Configuring the Disaster Recovery Search Path, on page 72.

**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.
### Configuring the Input Information

#### Setting Up Muting Thresholds Controls

- **Step 1**: From the D9800 web UI, choose **Input > Muting Thresholds**, or from the Main Menu of the D9800 front panel, choose **Setup > Noise Cutoff**.

- **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) Cutoff 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 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 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:

![Transport Default C/N Margin Relationship Diagram]

- **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

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

```
0.0 Audio Mute
```

```
0.1 Audio Restore
```

```
Audio Muted
```

```
Audio Restored
```

**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 UI 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.
Assigning a Channel to a Program Entry

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

a) From the D9800 web UI, 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 UI, 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 UI 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>
<tr>
<td>Channel Name</td>
<td>Status &gt; Program PIDs &gt; Stream</td>
<td>Displays the channel name of the current PE.</td>
</tr>
<tr>
<td>Conditional Access System ID</td>
<td>Status &gt; General &gt; CA System</td>
<td>Indicates the type of Conditional Access (CA) system used by the program (SA, BISS, or FTA).</td>
</tr>
<tr>
<td>Channel Authorised</td>
<td>Status &gt; General &gt; CA Auth</td>
<td>Indicates whether the receiver is authorized to receive the program (Yes or No).</td>
</tr>
<tr>
<td>Channel Encrypted</td>
<td>Status &gt; General &gt; CA Enc</td>
<td>Indicates whether the received program is encrypted (Yes or No).</td>
</tr>
<tr>
<td>Channel Scrambled</td>
<td>Status &gt; General &gt; CA Scr</td>
<td>Indicates whether the received program is scrambled (Yes or No).</td>
</tr>
</tbody>
</table>

Viewing the Service Replacement Status

From the D9800 web UI, 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 UI 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>
<tr>
<td>Web UI Field</td>
<td>Front Panel Menu</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------</td>
<td>-------------</td>
</tr>
<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 PID.s, 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>• Not Started - Indicates that an event has not started.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Primary - Indicates that a service replacement event is active, but the primary program is being displayed.</td>
<td></td>
<td></td>
</tr>
<tr>
<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>
<td></td>
<td></td>
</tr>
<tr>
<td>SR Type</td>
<td>SR Event Type</td>
<td>Indicates the type of service replacement event.</td>
</tr>
<tr>
<td>• None - Indicates that no service replacement event is scheduled.</td>
<td></td>
<td></td>
</tr>
<tr>
<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>
<td></td>
<td></td>
</tr>
<tr>
<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>
<td></td>
<td></td>
</tr>
<tr>
<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>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note** This is supported on single-stream units only.
Displaysthe start or end time of the service replacement event, when scheduled; otherwise, the default start time is displayed. The default start time is 2007/09/01 00:00:00.

### 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 UI, 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>Web UI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table Type</td>
<td>Type</td>
<td>Indicates the MPEG table acronym (PAT, CAT, PMT, TSDT, NIT, NIT Other, SDT, SDT Other, BAT, AEIT P/F, OEIT P/F, TDT, RST, ST, TOT, DIT, SIT, ECM Odd, ECM Even, EMM, DPI, DRT, CDT, MCT, MIT, MAT, ECT, or Invalid Table ID).</td>
</tr>
<tr>
<td>Table ID Extension</td>
<td>Tbl-ID</td>
<td>Displays the MPEG/DVB Table ID.</td>
</tr>
<tr>
<td>Status</td>
<td>Status</td>
<td>Indicates the reception status of the table (None, Partial, Full, Update, Timeout, or Lost).</td>
</tr>
<tr>
<td>Version</td>
<td>Ver</td>
<td>Indicates the table version number.</td>
</tr>
<tr>
<td>PID</td>
<td>PID</td>
<td>Indicates the value of the PID on which the table is present.</td>
</tr>
<tr>
<td>Number of Sections</td>
<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 UI, 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 UI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport Stream ID</td>
<td>TxCID</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-S 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 UI, 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 UI, 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 UI 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, MPG4 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 UTLID, 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.

<table>
<thead>
<tr>
<th>Web UI Field</th>
<th>Front Panel Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>Present</td>
<td>Indicates whether the PID is present in the incoming stream (Yes or No).</td>
</tr>
</tbody>
</table>

**Step 1**
From the D9800 web UI, 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 **CI CAM Auto Recovery** drop-down list, choose Enable (default) to attempt to automatically recover the CAM from descrambling failure. When failure is detected, the CI software resends the CA_PMT request to descramble again. If the descrambling fails four times consecutively, then the CAM is reset automatically, if the **CI CAM Auto Reset** is set to Enable.

**Step 6**
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 7**
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 8**
Apply the changes.
Setting up the Common Interface Program Description

Step 1 From the D9800 web UI, 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 77.

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 77.

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 UI, 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 UI 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>Manufacturer 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 UI, choose **Input > CI Status**, and refer to the CAM Operations 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 **MMI 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 **MMI Choice**. The submenus are displayed in the Message area below.
You can initialize the reset sequence to reset the CAM by clicking Reset.

### 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 UI, 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 UI, 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 UI 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>Web UI Column</td>
<td>Front Panel Menu</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</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.
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 89
• Configuring the HDMI Advanced Settings, on page 97
• Configuring the SDI Outputs, on page 97
• Setting up Audio Decoding, on page 99

Setting up the Video Information

Step 1 From the D9800 web UI, 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.

Note 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="image.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 PB" /></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 PB" /></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="16:9" /></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" /></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="image1" 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><img src="image2" alt="Auto" /></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><img src="image3" alt="16:9 L/B" /></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><img src="image4" alt="4:3 CCO" /></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><img src="image5" alt="4:3 P/B" /></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><img src="image6" alt="14:9" /></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><img src="image7" alt="16:9 SCALE" /></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="image8" alt="4:3 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="image9" 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="image10" 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 (widescreen) 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 UI (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 UI 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 Output</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>
</tbody>
</table>
Setting up the Video Closed Caption Information

<table>
<thead>
<tr>
<th>Web UI 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 UI, 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 UI 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 UI, 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:

- 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 89.

**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 UI, 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 Video and Audio Information

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 UI, 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 UI (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 UI, 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 89.

**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) Check the Use SMPTE-2038 check box to select as source for the service vertical ancillary data, received over an SMPTE-2038 PID.
b) 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.

c) The following table describes the remaining columns on the web UI. 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 value 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 UI, 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>
</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 UI, 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 \textbf{PMT Order} is selected, choose the PMT source for the audio channel from the \textbf{PMT Source} column, or the \textbf{PMT Scr} front panel menu (None, AUD1 to AUD64). You cannot select the same PID for both audio devices. If you select 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 \textbf{ST302 Stream Select} drop-down list, or the \textbf{Stream Select} front panel menu, choose the number of ST302 audio streams you want to decode (1 to 4).

\textbf{Note}  
This is not supported in the current release.

\textbf{Step 4}  
The \textbf{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 UI as 1, 2, 3, and 4, respectively.

\textbf{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 \textit{Setting the AES-3 Out Preference, on page 101}.

a) From the \textbf{Audio Mode} drop-down list, or the \textbf{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 \textbf{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>
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 [Setting the AES-3 Out Preference, on page 101](#).

**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 UI, 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).
## AES-3 Out Preference

<table>
<thead>
<tr>
<th>Input</th>
<th>PCM Samples</th>
<th>Compressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDP Mode</td>
<td>Transcode (Converter)</td>
<td>Passthrough</td>
</tr>
<tr>
<td>MPEG LA (MPEG-1 and MPEG-2)</td>
<td>PCM</td>
<td>PCM</td>
</tr>
<tr>
<td>Dolby Digital (AC-3)</td>
<td>PCM</td>
<td>Dolby Digital (AC-3)</td>
</tr>
<tr>
<td>Dolby Digital Plus (E-AC-3) (Bit rate &lt; 1.5 Mbps)</td>
<td>PCM</td>
<td>Dolby Digital (AC-3)</td>
</tr>
<tr>
<td>Dolby Digital Plus (E-AC-3) (Bit rate &gt; 1.5 Mbps)</td>
<td>PCM</td>
<td>Dolby Digital (AC-3)</td>
</tr>
<tr>
<td>MPEG-2 AAC, MPEG-4 (AAC and HE-AAC)</td>
<td>PCM</td>
<td>MPEG-2 AAC, MPEG-4 (AAC and HEAAC)</td>
</tr>
</tbody>
</table>

The following stream formats support the SMPTE-238 compliance standard only: Dolby Digital and Dolby Digital Plus (passthrough and transcode).

The following stream formats support the IEC61937-2 compliance standard only: MPEG-2 AAC-LC ADTS, MPEG-2 HE-AAC (SBR) ADTS, MPEG-4 AAC-LC ADTS, MPEG-4 HE-AAC (SBR) ADTS, MPEG-4 AAC LATM/LOAS, and MPEG-4 HE-AAC (SBR) LATM/LOAS.

### Step 4
From the DD+ Output drop-down list, or the DDP front panel menu, choose the format of the digital audio output. Choose Trans to transcode to Dolby Digital audio output. If Pass (passthrough) is selected and the bit rate is less than 1536 kbps (48 KHz), passthrough is performed and Dolby Digital Plus compressed out is received. If Pass (passthrough) is selected and the bit rate is more than 1536 Kbps, transcoding will be performed. This setting affects only the AES-3id and SDI outputs.

---

### 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 UI, 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 97.

---

### Viewing the Audio Status

From the D9800 web UI, 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 UI 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>
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.

### Viewing the Advanced Audio Status

From the D9800 web UI, 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 UI 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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Web UI 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></td>
<td></td>
<td><strong>Note</strong> 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></td>
<td></td>
<td><strong>Note</strong> 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></td>
<td></td>
<td><strong>Note</strong> 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></td>
<td></td>
<td><strong>Note</strong> 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 UI 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 UI, 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>
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 107
- Testing Cue Tones, on page 108
- Setting up the Cue Tone Sequences, on page 109
- Setting up Services to be Decoded by the Receiver, on page 109

---

### Setting up Cueing Parameters

---

**Note**

This is available on single-stream units only.

---

**Step 1**

From the D9800 web UI, 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>Relay Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NC-C</td>
</tr>
<tr>
<td>Alarm</td>
<td>Unit Power Off</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Alarm State</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>No Alarm</td>
<td>Close</td>
</tr>
<tr>
<td>Trigger</td>
<td>Active (selected in PNC)</td>
<td>Close</td>
</tr>
<tr>
<td></td>
<td>Inactive</td>
<td>Open</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 UI, 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

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

### Step 1
From the D9800 web UI, choose **Audio & Video > Cue Tone**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Outputs > Cueing**.

### Step 2
The **Sequence Number** column on the web UI 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).

### Step 3
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.

### Step 4
In the **Sequence Tones** field, or the **Tones** front panel menu, set the three digit tone sequence (1 to 999).

### Step 5
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 108.

### Step 6
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.

### Step 7
Apply the changes.

---

## Setting up Services to be Decoded by the Receiver

**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 UI, choose **Audio & Video > Decode Enables**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > Decode**.

### Step 2
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.

### Step 3
Apply your changes.
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 111
- Configuring the ASI or MPEGoIP Output General Settings, on page 113
- Configuring the ASI or MPEGoIP Output Mode, on page 114
- Configuring the MPE Settings, on page 116
- Setting Up Redundancy Controls for MPEG over IP and MPE Outputs, on page 117
- Synchronizing the Output Services, on page 118
- Resolving Conflicts, on page 121
- Setting up the DPM Program Entries, on page 122
- Copying between ASI and MPEGoIP DPM Settings, on page 125
- Configuring the Program Entries, on page 126
- Setting the SAP IP Address, on page 128
- Setting the Transport Packet Limits, on page 129
- Configuring the Forward Error Correction Settings, on page 130
- Configuring MPEG over IP or IP Data Streams, on page 132
- Configuring the Transcoder Settings, on page 133

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 UI (single-stream unit): From the D9800 web UI, 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.
- 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 MPEGoIP Output Mode

Step 1
Do one of the following:

- Web UI (single-stream unit): From the D9800 web UI, 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, MPEGoIP, 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

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.

### 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 transoded, 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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPTS Service Channels Only (MPEG over IP only)</td>
<td>The service channel is passed with the same channel number, PMT PIDs, and ES PIDs.</td>
</tr>
<tr>
<td>SPTS MAP Service Channels Only (MPEG over IP only)</td>
<td>The service channel is mapped to the preconfigured channel number, PMT PIDs, and ES PIDs.</td>
</tr>
<tr>
<td>SPTS Transcoding (multi-stream units only)</td>
<td>The service channel is mapped to the preconfigured channel number, PMT PIDs, and ES PIDs. The PEs are automatically set to XCode.</td>
</tr>
</tbody>
</table>

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.</td>
</tr>
<tr>
<td></td>
<td>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 77.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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 77.</td>
</tr>
<tr>
<td></td>
<td>In a multi input mode, <strong>Edited by User (MS Mode)</strong> status is displayed.</td>
</tr>
<tr>
<td>Mode Status or Config Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Auto Re-Mapped</td>
<td>The output map changed automatically to fix the output channel or PID conflicts at the time of setup.</td>
</tr>
<tr>
<td></td>
<td>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 77.</td>
</tr>
<tr>
<td></td>
<td>In a multi input mode, <strong>Auto re-mapped (MS Mode)</strong> status is displayed.</td>
</tr>
<tr>
<td>Chg by Uplink</td>
<td>DPM output changes were made, based on the uplink request after setting the Output Mode.</td>
</tr>
<tr>
<td></td>
<td>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 77.</td>
</tr>
<tr>
<td></td>
<td>In a multi input mode, <strong>Chg by Uplink (MS Mode)</strong> status is displayed.</td>
</tr>
<tr>
<td>Auto-Adjusted</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>For more information on single input and multi input modes, see Assigning a Channel to a Program Entry, on page 77.</td>
</tr>
<tr>
<td>Auto-Adjusted (MS Mode)</td>
<td>This is for multi-stream units only.</td>
</tr>
<tr>
<td></td>
<td>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 77.</td>
</tr>
</tbody>
</table>

**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 UI, 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 (ред) to edit the entry, or click delete (отмена) 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 UI** (single-stream unit): From the D9800 web UI, choose **Transport Stream > MPEG over IP Output**, or choose **System Settings > MPE**.
- **Web UI** (multi-stream unit): From the D9800 web UI, choose **Transport Stream > IP Data 1/Data 2 Output or IP Data 3/Data 4 Output**.
- **Front Panel**: From the Main Menu of the D9800 front panel, choose **Setup > IP > Redundancy**.
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 UI (single-stream unit): From the D9800 web UI, 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 UI 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 PIDs 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 121**.
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 UI (single-stream unit): From the D9800 web UI, 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 UI (multi-stream unit): From the D9800 web UI, 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 121. 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 UI (single-stream unit): From the D9800 web UI, choose **Transport Stream > ASI Output** or **MPEG over IP 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 124.

### Configuring DPM General Settings

#### Step 1

Do one of the following:

- Web UI (single-stream unit): From the D9800 web UI, 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 UI (multi-stream unit): From the D9800 web UI, 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 Duplication Method drop-down list, or the Duplic 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 UI (single-stream only): From the D9800 web UI, 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 UI (multi-stream only): From the D9800 web UI, 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 > ASI1, 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 113.

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.
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 122.

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 123.

Step 6
Apply the changes.

Copying between ASI and MPEGoIP DPM Settings

Step 1
Do one of the following:

- Web UI (single-stream unit): From the D9800 web UI, 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 UI: 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.
• Front Panel: Choose **Copy: From** to select the output from which you want to copy all the DPM data, and then choose **Copy: To** to select the output to which you want to copy all the DPM data. Choose Yes from the **Apply** menu to apply the changes.

---

### Configuring the Program Entries

**Step 1**

Do one of the following:

- Web UI (single-stream unit): From the D9800 web UI, 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 77**.

**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 77**. 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 127**. 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 transcode 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 120.

**Step 2**  
From the D9800 web UI, 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 126.

**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 UI (single-stream unit): From the D9800 web UI, 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**.
• 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  
In 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 UI (single-stream unit): From the D9800 web UI, 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 UI (multi-stream unit): From the D9800 web UI, 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 UI (single-stream unit): From the D9800 web UI, 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 release 2 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 UI (single-stream unit): From the D9800 web UI, 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).
Configuring the Transport Stream Information

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 UI (single-stream unit): From the D9800 web UI, 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 UI (single-stream unit): From the D9800 web UI, 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 UI, 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 135.</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 135.</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 114.

**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 77.
Configuring the HD and SD Transcode Settings

Step 1
From the D9800 web UI, 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 UI, 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 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 transcoded 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 transcoded 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 UI, 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 DVB</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 UI, 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 UI 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.
CHAPTER 9

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 139
• Setting up the Unicast Routing Information, on page 141
• Setting up SNMP Information, on page 142
• Configuring the DNS Server, on page 143
• Using the Ping or Traceroute Tool, on page 143

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.

Step 1
From the D9800 web UI, choose System Settings > IP Settings. Or, from the Main Menu of the D9800 front panel, choose Setup > IP > IP.

Step 2
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.

Step 3
In the Destination IP Address field, or the IP Address front panel menu, enter the IPv4 destination IP address for the interface.

Step 4
In the Mask field or front panel menu, enter the number of CIDR (Classless Inter-Domain Routing) bits (8 to 30).

Step 5
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.

<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**  Ensure that you are logged in to the D9800 web UI with admin privileges.

**Step 2**  From the D9800 web UI, choose System Settings > Account Management and refer to the Protocol Control area. Or, from the Main Menu of the D9800 front panel, choose Setup > IP > Protocols.

**Note**  The Protocol Control area is moved from the IP Settings page to the Account Management page.

**Step 3**  From the HTTP drop-down list or front panel menu, choose one of the following:

- **HTTP** - Enables HTTP connections. The associated TCP port number is 80.
- **HTTPS (default)** - Enables an encrypted access to the web server. 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 UI. The HTTPS is displayed in the IP address to denote that it is a secure access.

**Note**  To use the web services API commands, you must choose HTTP or HTTPS.

**Step 4**  From the Management Interface drop-down list or the Mgmt Interface front panel menu, choose one of the following:

- **Mgmt Only (default)** - Exposes the web UI or RESTful APIs to the Management interface only.
- **All Interfaces** - Exposes the web UI or RESTful APIs to all interfaces (Management and Data 1 and 2 for single-stream units only, or Data 1 to 4 for multi-stream units only). This is useful if you want to control the D9800 receiver from multiple LAN segments.

**Step 5**  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 6  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 50.

Step 7  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.

Step 8  Apply the changes.

### Configuring the System Logs

Step 1  From the D9800 web UI, choose System Settings > IP Settings and refer to the Syslog 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:


Step 4  Apply the changes.

### Setting up the Unicast Routing Information

Step 1  From the D9800 web UI, 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>
</tbody>
</table>
### Setting up SNMP Information

**Step 1**
From the D9800 web UI, 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 UI, 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 UI, 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 UI, 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.
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 145
- Alarms, on page 145
- Warnings, on page 162
- Setting up Alarms, on page 171
- Setting up Warnings, on page 172
- 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 171 and Setting up Warnings, on page 172.

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.
## Alarms

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>
</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>
</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>
</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>
</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>
</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>
</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>
</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
<td>---------</td>
<td>-----------------------------------</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>
</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>
</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>
</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>
</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>
</tr>
<tr>
<td>CI Option, System, Tuner, or Decoder FPGA Mismatch</td>
<td>Set</td>
<td>CI Option, System, Turner, or Decoder Version not in Synch</td>
<td>The unit is not running the selected System, Turner, CI Option, or Decoder FPGA version. Reboot the unit with the correct FPGA version.</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
<td>---------</td>
<td>-----------------------------------</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>
</tr>
<tr>
<td>Config Mismatch Fault</td>
<td>Clear</td>
<td>Mismatch Resolved</td>
<td>Message displayed when alarm is cleared.</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>
</tr>
<tr>
<td>D/R in progress</td>
<td>Reset</td>
<td>No disaster</td>
<td>Message displayed when alarm is cleared.</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. Text 2: Data Corrupted, Data Repaired, partial loss possible, Data initialized to defaults. Text 2 (applicable to Access database only): Data initialized to defaults. Password must be reset.</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
<td>---------</td>
<td>-----------------------------------</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>
</tr>
<tr>
<td>Decode Overflow</td>
<td>Clear</td>
<td>Clear</td>
<td>Alarm automatically clears after five seconds.</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>
</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>
</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------</td>
<td>---------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</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>
</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>
</tr>
<tr>
<td>Digital Program Mapping</td>
<td>Clear</td>
<td>Digital Program Mapping - OK</td>
<td>Message displayed when alarm is cleared.</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>
</tr>
<tr>
<td>Download Fault</td>
<td>Clear</td>
<td>Clear DL Alarm</td>
<td>Message displayed when alarm is cleared.</td>
</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>
</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------</td>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Fan                          | Set          | ecc_set_fan_alarm: Alarm: [FAN name] alarm [Value] | Fan RPM is out of normal operating range, due to a hardware issue. 
Return the unit to Cisco Services as soon as possible. |
| Fan                          | Clear        | ecc_reset_fan_alarms                         | Message displayed when alarm is cleared.                                                            |
| Signal Status                | Set          | ASI/RF Signal - No Content                   | 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. |
| Input &gt; Signal Status    | Set          | Signal is lost                               | 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. |
| Input &gt; Signal Status    | Set          | Tuning Parameters Invalid                    | 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. |
| Input &gt; Signal Status    | Clear        | Signal is locked or Tuning Parameters Valid  | Message displayed when alarm is cleared, indicating that the signal is OK or the tuning parameters are valid. |
| Internal transcoder buffer overflow or underflow                   | Set          | Input Underflow, Input Overflow, Output Underflow, or Output Overflow | Internal transcoder buffer overflow or underflow. Errors will be seen in the transcoded output. Possible transcoder firmware error. 
If problem persists, contact Cisco Services. |
<table>
<thead>
<tr>
<th>Alarm</th>
<th>Message Type</th>
<th>Message</th>
<th>Description, with Cause and Remedy</th>
</tr>
</thead>
<tbody>
<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>
</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>
</tr>
<tr>
<td>LEC Timeout</td>
<td>Clear</td>
<td>LEC received</td>
<td>Message displayed when alarm is cleared.</td>
</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>
</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>
</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 persists, contact Cisco Services.</td>
</tr>
<tr>
<td>Low Intra-Inter scores</td>
<td>Clear</td>
<td>Quality restored</td>
<td>Message displayed when alarm is cleared.</td>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</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. Note 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>
</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>
</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>
</tr>
<tr>
<td>MPoIP Bitrate Port #1 2, 3 or 4</td>
<td>Clear</td>
<td>Total configured output is normal</td>
<td>Message displayed when the warning is cleared.</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 streamuxed streams 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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------</td>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</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>
</tr>
<tr>
<td>MPoIP Engine Failure</td>
<td>Clear</td>
<td>MPEGoIP Output Restored</td>
<td>Message displayed when alarm is cleared.</td>
</tr>
<tr>
<td>MPoIP Engine Failure</td>
<td>Clear</td>
<td>Error Cleared</td>
<td>Message displayed when alarm is cleared.</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>
</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>
</tr>
<tr>
<td></td>
<td></td>
<td>Fault Cleared: Input disabled</td>
<td></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>
</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------</td>
<td>---------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</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>
</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>
</tr>
<tr>
<td>PE n CI Status</td>
<td>Clear</td>
<td>Descrambling OK</td>
<td>Message displayed when alarm is cleared.</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>
</tr>
<tr>
<td>PE n: CA System Error</td>
<td>Clear</td>
<td>Fault Cleared</td>
<td>Message displayed when alarm is cleared.</td>
</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>--------------------------</td>
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<td>---------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</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>
</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>
</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>
</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>
</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>
</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
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</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>
</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>
</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>
</tr>
<tr>
<td>PE n: Loss of Input</td>
<td>Clear</td>
<td>Fault reset</td>
<td>Message displayed when alarm is cleared.</td>
</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>
</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>
</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>
</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>Shutdown Event</td>
<td>Set</td>
<td>WDOG: FPGA not loaded</td>
<td>FPGA has not been loaded, due to possible software/hardware issue.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clear alarms, reset unit, notify Cisco Services if the problem persists.</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, 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clear alarms, reset unit, notify Cisco Services if the problem persists.</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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clear alarms, reset unit, notify Cisco Services if the problem persists.</td>
</tr>
<tr>
<td>Alarm</td>
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<td>Description, with Cause and Remedy</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>
</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>
</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>
</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
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<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Signal Quality</td>
<td>Set</td>
<td>Signal Quality Fault Cleared or Audio Unmuted</td>
<td>Message displayed when alarm is cleared.</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>
</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>
</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>
</tr>
<tr>
<td>TS Input Overflow</td>
<td>Clear</td>
<td>Clear</td>
<td>Alarm automatically clears after five seconds.</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>
</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>
</tr>
<tr>
<td>Alarm</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Cause and Remedy</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------</td>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</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>
</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>
</tr>
<tr>
<td>Throttling fault</td>
<td>Clear</td>
<td>Quality Restored</td>
<td>Message displayed when alarm is cleared.</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>
</tr>
<tr>
<td>Transcoder Reset</td>
<td>Clear</td>
<td>Firmware Reset Completed</td>
<td>Message displayed when alarm is cleared.</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>
</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>
</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>
</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.

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Message Type</th>
<th>Message</th>
<th>Description, with Cause and Remedy</th>
</tr>
</thead>
<tbody>
<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>
</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>
</tr>
<tr>
<td>Unsupported Vid Prof</td>
<td>Clear</td>
<td>Problems cleared</td>
<td>Message displayed when alarm is cleared.</td>
</tr>
<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>
</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>
</tr>
<tr>
<td>Xcode License fault</td>
<td>Clear</td>
<td>Transcoder working.</td>
<td>Message displayed when alarm is cleared.</td>
</tr>
</tbody>
</table>
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>Warning</th>
<th>Message Type</th>
<th>Message</th>
<th>Description, with Causes and Remedies</th>
</tr>
</thead>
<tbody>
<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>
</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>
</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>
</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>
</tr>
<tr>
<td>Backup Failure Reason</td>
<td>Clear</td>
<td>Clear</td>
<td>Message displayed when restore is completed.</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>
</tr>
<tr>
<td>Backup Operation State</td>
<td>Clear</td>
<td>Backup Complete</td>
<td>Message displayed when backup is completed.</td>
</tr>
</tbody>
</table>
### Warnings

<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>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 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>
</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>
</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>
</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>
</tr>
<tr>
<td>CI Status</td>
<td>Clear</td>
<td>OK</td>
<td>Message displayed when the warning is cleared.</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.&lt;br&gt;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>
</tr>
<tr>
<td>Warning</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Causes and Remedies</td>
</tr>
<tr>
<td>---------</td>
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</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>
</tr>
<tr>
<td>Decoder Low Memory (available on single-stream units only) Controller, Transcoder#, or HEVC Proc# Low Memory (available on multi-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>
</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>
</tr>
<tr>
<td>DR RF Tuning Mismatch</td>
<td>Set</td>
<td>PE#, Backup# (RF#): Downlink and LO frequency mismatch</td>
<td>Tuning for the specified RF input is incompatible with the existing RF backup node(s). This is caused by the user changing the RF tuning parameters. To resolve the issue, update the frequency parameter in the flagged RF profile(s). If the affect RF profile(s) do not change, they will be ignored during the disaster recover search.</td>
</tr>
<tr>
<td>DR RF Tuning Mismatch</td>
<td>Clear</td>
<td>Fault Cleared</td>
<td>The RF tuning is compatible with the existing RF backup node(s).</td>
</tr>
<tr>
<td>DVB-S2X Not Licensed</td>
<td>Set</td>
<td>DVB-S2X Tuning Not Licensed</td>
<td>DVB-S2X modulation is detected for an activated RF input without a valid DVB-S2X license.</td>
</tr>
<tr>
<td>Warning</td>
<td>Message Type</td>
<td>Message</td>
<td>Description, with Causes and Remedies</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DVB-S2X Not Licensed</td>
<td>Clear</td>
<td>DVB-S2X license fault cleared</td>
<td>The detected modulation is no longer DVB-S2X or the DVB-S2X license is available.</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 “auto” REDN modes. Make sure the link speed on paired ETH ports are identical.</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>
</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>
</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>
</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>
</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>
| 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. |
<p>| Input&lt;id&gt; Program Status        | Clear        | MOIP Fault Cleared                     | Message displayed when warning is cleared.                                                                                                                                                                                            |
| Network ID Mismatch TSn         | Set          | Original Network ID in NIT and SDT mismatched | 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. |
| Network ID Mismatch TSn         | Clear        | Original Network ID in NIT and SDT matched | Message displayed when warning is cleared.                                                                                                                                                                                             |
| No NIT PID in PAT               | Set          | &lt;Input Name&gt; PAT - No NIT pid           | PAT is missing reference to the NIT PID. Check the uplink configuration to see why a valid NIT PID is not included in PAT.                                                                                                                |
| No NIT PID in PAT               | Clear        | Fault Cleared                          | Message displayed when the warning is cleared.                                                                                                                                                                                            |</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>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 transcode 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</td>
<td>There is an error in the transport stream ID for the displayed channel. Contact your uplink administrator.</td>
</tr>
<tr>
<td>PSI/SI Stream Error TSn</td>
<td>Clear</td>
<td>No PSI/SI Stream Error detected</td>
<td>Message displayed when warning is cleared.</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>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>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>Temperature Warning</td>
<td>Set</td>
<td>Temperature over Warning threshold</td>
<td>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.</td>
</tr>
<tr>
<td>Temperature Warning</td>
<td>Clear</td>
<td>Temperature normal</td>
<td>Message displayed when warning is cleared, indicating that the temperature is within the normal operating range.</td>
</tr>
<tr>
<td>Transcoder Alarm</td>
<td>Set</td>
<td>Failed on PE(s): x,y,z</td>
<td>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.</td>
</tr>
<tr>
<td>Transcoder Alarm</td>
<td>Clear</td>
<td>Fault Cleared</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>Transport Error</td>
<td>Set</td>
<td>Continuity Count Error</td>
<td>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.</td>
</tr>
<tr>
<td>Transport Error</td>
<td>Set</td>
<td>Transport Error Indicator</td>
<td>Transport packets are marked as &quot;errored&quot; 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.</td>
</tr>
<tr>
<td>Transport Error</td>
<td>Clear</td>
<td>Continuity Count Error Cleared or Transport Error Indicator Cleared</td>
<td>Message displayed when no transport input errors are detected.</td>
</tr>
<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 89.</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>
</tbody>
</table>
Setting up Alarms

<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>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>

Step 1  From the D9800 web UI, choose System Settings > Setup (under Alarms). Or, from the Main Menu of the D9800 front panel, choose Setup > Alarm/Warn.

Step 2  Check the Enable Alarm/Warning Front Panel Reminder check box, or choose Enable from the FP Alarm Reminder front panel menu, for the highest priority alarm to flash on the LCD display for a two-second interval every 10 seconds. The alarm will continue to flash periodically until it is either cleared or the alarm reminder is unchecked or disabled.

Step 3  On a single-stream unit only, check the Enable Video Cutoff on Alarm Condition check box, or choose Enable from the Alarm Vid Cutoff front panel menu, to disconnect the SDI and CVBS outputs if any enabled alarm is active on the receiver. When video is cut off, there will be no horizontal or vertical synchronization on the output and the screen is black. This is useful for downstream redundancy switching by detecting a loss of video signal.

Step 4  The Alarm Setup area displays all the alarm messages, or select the System Alarm Name front panel menu to scroll through the alarms. You can configure the following for each of the alarms:

  a) From the Enable/Disable drop-down list, or the Enb front panel menu, choose Yes to report the alarm message. Choose No to disable the alarm message and the Relay and Trap settings are ignored.
     
     Note  The Enable/Disable setting must be set to Yes for the Relay and Trap settings to be functional.

  b) If current alarm is enabled, choose Yes from the Trap drop-down list, or the Trp front panel menu, and the SNMP trap message will be sent when the alarm is set or cleared.
     
     Note  No is a read only value that indicates the setting is Yes, but is currently being suppressed because the alarm is disabled (Enb is set to No).

  c) If the current alarm is enabled, choose Yes from the Relay drop-down list, or the Rly front panel menu, to trigger the rear panel alarm relay when the alarm is set or cleared.
     
     Note  No is a read only value that indicates the setting is Yes, but is currently being suppressed because the alarm is disabled (Enb is set to No).
Setting up Warnings

Step 1  From the D9800 web UI, 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 171.

Note  For more information on the front panel reminder setting, see Setting up Alarms, on page 171.

Step 4  Apply the changes.

Viewing Alarm/Warning History

From the D9800 web UI, 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 145 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 UI, 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>Status</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------</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 175

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 (multi-stream unit only, with a transcoder card)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate Control</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
</tr>
<tr>
<td>User Rate</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
</tr>
<tr>
<td>Descramble Mode</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Descrambled</td>
</tr>
<tr>
<td>Regenerate</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
</tr>
<tr>
<td>Insert Null Packet</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</td>
<td>Any (unchanged)</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</td>
<td>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>
</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>Drop</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>Ctrl By Table</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>SA Std</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>Valid Ch</td>
</tr>
<tr>
<td>PAT</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>Regen</td>
<td>Regen</td>
<td>Regen</td>
<td>Regen</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>If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass</td>
<td>Regen</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>Regen</td>
</tr>
<tr>
<td>TSDT</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>NIT</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>Regen</td>
<td>Regen</td>
<td>Regen</td>
<td>Regen</td>
</tr>
<tr>
<td>NITO</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>PwRc</td>
<td>PwRc</td>
<td>PwRc</td>
<td>Drop</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>Regen</td>
</tr>
</tbody>
</table>
Transcoding (multi-stream unit only, with a transcoder card)

<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>SDTO</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>PwRc</td>
<td>PwRc</td>
<td>PwRc</td>
<td>Drop</td>
</tr>
<tr>
<td>BAT</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>PwRc</td>
<td>PwRc</td>
<td>PwRc</td>
<td>Drop</td>
</tr>
<tr>
<td>EIT, ECM, EMM, DRT, CDT</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Drop</td>
</tr>
<tr>
<td>TDT, RST, TOT, DIT, SIT</td>
<td>Not Displayed</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>PE Action (all PEs)</td>
<td>Drop</td>
<td>Pass</td>
<td>Pass</td>
<td>Map</td>
<td>Map</td>
<td>XCode</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>Ctrl By Table</td>
<td>Ctrl By Table</td>
<td>Ctrl 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>
<tr>
<td>Output Mode</td>
<td>SPTS Service Chans Only</td>
<td>SPTS MAP Svc Chans Only</td>
<td>SPTS Transcoding (multi-stream unit only, with a transcoder card)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------</td>
<td>-------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<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>
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 IEC/CEE 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 présent appareil numerique n’emet pas de bruites radioelectriques qui dépassant les limites applicables aux appareils numeriques de Class B prescrtes dans le reglement sur le brouillage radioelectric edict 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
Headquarters at
170 West Tasman Drive
San Jose, CA 95134
USA

Declare under sole responsibility that the product,

Brand : Cisco
Description : Chassis and cards

Model :
D9800-M-CT, D9800-ANALOG, D9800-D/CT, D9800-HDVC-REC, D9800-MS-MPEGG01D, D9800-SAT-GEN1, D9800-SS-BASIC, D9800-SS-MPEGG01D, D9800-TX11

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:

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<tbody>
<tr>
<td>Safety</td>
<td>EN60950:2014</td>
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<td>Environmental</td>
<td>EN50581:2013</td>
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EN are relevant harmonized standards.

Date & Place of issue: 21/03/17, San Jose

Signature:

Tony Youssef
Director, Technology Standards
Corporate Compliance

Edgard Vanged
Cisco Systems Belgium
De Klebsaan, 6A
B-1831 Drogen - Belgium

EU Authorized Representative: