



Cisco D9800 Network Transport Receiver Version 2.0 Installation and Configuration Guide

First Published: 2016-11-30

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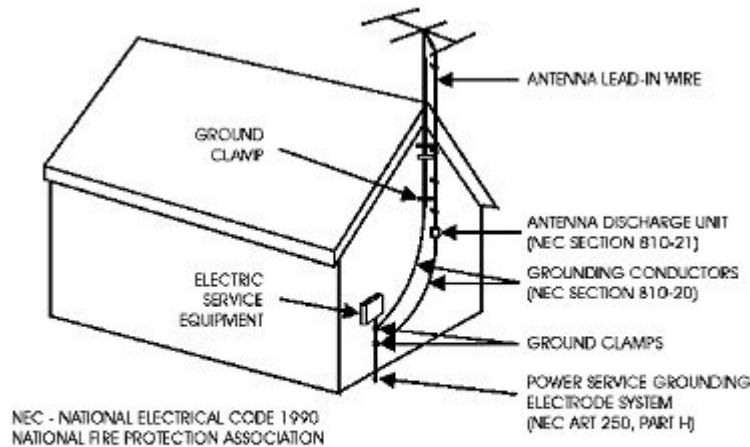


IMPORTANT SAFETY INSTRUCTIONS

This symbol alerts you to the presence of uninsulated dangerous voltage inside the product enclosure that poses a risk of electric shock.		CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN		This symbol alerts you to important operating and maintenance (servicing) instructions included with this product.
CAUTION TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVERS FROM THIS UNIT. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL. SEE ADDITIONAL SAFETY INSTRUCTIONS BELOW.				
WARNING TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.				
CAUTION THIS EQUIPMENT MAY HAVE UP TO TWO POWER SUPPLY CORDS. TO REDUCE THE RISK OF ELECTRIC SHOCK, TWO POWER SUPPLY CORDS MAY HAVE TO BE DISCONNECTED BEFORE SERVICING.				

- 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.



TO CATV SYSTEM INSTALLER

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

- 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!

	You will find this symbol on the product and/or in the literature that accompanies this product. It indicates important operating or maintenance instructions.
	You may find this symbol on the product and/or in the literature that accompanies this product. It indicates a live terminal; the symbol pointing to the terminal device.
	You may find this symbol on the product and/or in the literature that accompanies this product. It indicates a protective earth terminal.
	You may find this symbol on the product and/or in the literature that accompanies this product. It indicates excessive or dangerous heat.

Power

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

Enclosure

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

Cables

- Always disconnect all power cables before servicing this product.
- Always pull on the plug or the connector to disconnect a cable. Never pull on the cable itself.
- Do not walk on or place stress on cables or plugs.

Factory service

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

Règles de sécurité

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

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

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

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

	Ce symbole figure dans la documentation accompagnant ce produit. Il indique d'importantes instructions de fonctionnement ou d'entretien.
	Ce symbole peut être attaché à ce produit. Il indique une borne sous tension; la direction indique la borne.
	Ce symbole peut être attaché à ce produit. Il indique une borne de terre de protection.
	Ce symbole peut être attaché à ce produit. Il indique une température excessive ou dangereuse.

Alimentation

- Important! Ce produit fait partie de la classe I. Vous devez le mettre à la terre.
- Ce produit se branche dans une prise murale. Cette dernière doit être placée à proximité du produit et doit être facilement accessible.
- Ne branchez ce produit qu'à la source d'alimentation indiquée sur son panneau arrière.

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

Enceinte

- Ne laissez pas l'humidité pénétrer dans ce produit.
- N'ouvrez pas l'enceinte de ce produit, sauf instructions contraires.
- Ne forcez pas d'objets dans les ouvertures du boîtier.

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 beeinträchtigen, schalten Sie es ab und sichern es gegen weitere Benutzung.

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

	Dieses Symbol erscheint auf dem Gerät und/oder in der ihm beiliegenden Literatur. Es bedeutet wichtige, zu beachtende Betriebs- oder Wartungsanweisungen.
	Wenn dieses Zeichen am Gerät angebracht ist, warnt es vor einer spannungsführenden Stelle.
	Dieses Symbol kennzeichnet auf dem Gerät die Anschlußstelle der Sicherheitserde.



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

Netzspannung

- Wichtig! Dieses Gerät ist ein Produkt der Schutzklasse I. Es muß geerdet werden.
- Das Gerät ist an einer Steckdose anzuschließen. Diese muß sich leicht zugänglich in unmittelbarer Nähe des Gerätes befinden.
- Die Netzversorgung muß den auf der Rückwand des Gerätes angegebenen Werten entsprechen.
- Falls sich kein Hauptschalter am Gerät befindet, dient das Netzkabel diesem Zweck.

Gehäuse

- Das Innere des Gerätes ist vor Feuchtigkeit zu schützen.
- Das Gehäuse ist nicht zu öffnen.
- Niemals einen Gegenstand durch die Gehäuseöffnungen einführen!

Kabel

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

Hersteller-Wartung

- Wartungsarbeiten sind nur durch vom Hersteller autorisierte Techniker vorzunehmen.

Precauciones de seguridad

¡Protéjase contra la electrocución y proteja su sistema contra los daños!

Este producto cumple con los criterios internacionales de seguridad y diseño. Observe todas los procedimientos de seguridad que aparecen en esta guía, y los símbolos de seguridad adheridos a este producto.

Si las circunstancias impiden la operación segura de este producto, suspenda la operación y asegure este producto para que no siga funcionando.

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

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

Alimentación

- Importante! Este es un producto de Clase I. Tiene que estar conectado a tierra.
- Este producto se conecta a un enchufe. El enchufe necesita estar cerca del producto y ser fácilmente accesible.
- Conecte este producto únicamente a la fuente de suministro eléctrico indicada en el panel posterior del producto.
- Si el producto no tiene interruptor para la línea principal, utilice el cordón toma de corriente para este propósito.

Cubierta

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

Cables

- Siempre desconectar todos los cables eléctricos antes de revisar o reparar el producto.
- Tire siempre del enchufe o del conector para desconectar un cable. Nunca tire del cable mismo.
- No camine ni aplique presión sobre los cables o enchufes.

Revisión y reparación de fábrica

- Solo personal aprobado por la fábrica puede darle servicio al producto.

Precauzioni di sicurezza

Protegetevi da scosse elettriche e proteggete il vostro sistema da possibili danni!

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

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

	Questo simbolo, che appare nella letteratura di accompagnamento del prodotto, indica importanti istruzioni d'uso e di manutenzione.
	Sul prodotto potete vedere questo simbolo che indica un dispositivo terminale sotto tensione; la freccia punta verso il dispositivo.
	Potrete trovare il presente simbolo applicato a questo prodotto. Questo simbolo indica un terminale protettivo di messa a terra.
	Potrete trovare il presente simbolo attaccato a questo prodotto. Questo simbolo indica un calore eccessivo o pericoloso.

Alimentazione

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

- Protegete 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.

Riparazioni 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, page xxi](#)
- [Conventions, page xxi](#)
- [Related Documentation, page xxii](#)
- [Obtaining Documentation and Submitting a Service Request, page xxiii](#)

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.

Conventions

This guide uses the following conventions.

Conventions	Indication
bold font	Commands and keywords and user-entered text appear in bold font.
<i>italic font</i>	Document titles, new or emphasized terms, and arguments for which you supply values are in italic font.
[]	Elements in square brackets are optional.
{x y z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.

Conventions	Indication
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
<code>courier font</code>	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

- *Cisco D9800 Network Transport Receiver Data Sheet*, available at the following URL:
<http://www.cisco.com/c/en/us/products/video/digital-receivers-decoders/datasheet-listing.html>.
- *Open Source Used In Cisco D9800 Network Transport Receiver*, available at the following URL:
http://www.cisco.com/go/receivers_licensing.
- *Release Notes for Cisco D9800 Network Transport Receiver*, available at the following URL:
http://www.cisco.com/go/receivers_release_notes.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see [What's New in Cisco Product Documentation](#).

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the [What's New in Cisco Product Documentation RSS feed](#). RSS feeds are a free service.



CHAPTER

1

Installing the D9800 Network Transport Receiver

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



Warning

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

- [Safety Guidelines, page 1](#)
- [Mounting a D9800 Receiver to a Rack, page 2](#)
- [Rear Connector Panels, page 3](#)
- [Connecting AC Power to the D9800 Receiver, page 5](#)
- [Connecting to the Satellite Input, page 6](#)
- [Connecting the Input/Output Signals, page 6](#)
- [External Alarm System Connector, page 8](#)
- [Connecting the Ethernet Management Interface, page 11](#)
- [Viewing the Hardware Information, page 11](#)

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 () , 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

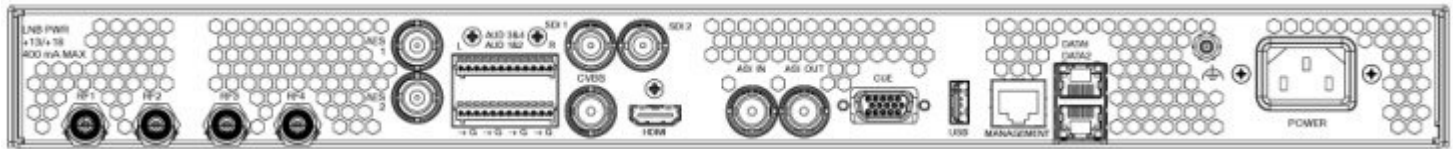
Avoid personal injury and damage to this equipment. Mounting this equipment in the rack should be such that a hazardous condition is not caused due to uneven mechanical loading.

-
- 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

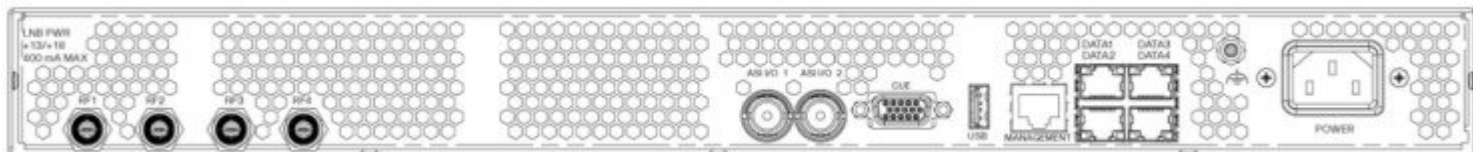
The diagram below shows the rear connector panel of the D9800 base chassis with ASI and MPEGoIP Input/Output (D9800-SS-MPEGOIP), with SDI (D9800-3G-SDI) and four port satellite input card (D9800-SAT-GEN1) options installed.

Figure 1: D9800-SS-MPEGOIP Rear Connector Panel, with D9800-3G-SDI and D9800-SAT-GEN1 Options



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.

Figure 2: D9800-MS-MPEGOIP Rear Connector Panel, with D9800-SAT-GEN1 Option



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

Connector	Description	Type
RF1 to RF4	Each input accepts an LNB signal input. RF1 provides LNB power for use when no external LNB power source is available. RF2 to RF4 require an external LNB power source.	F
AES1 and AES2	These are AES-3id outputs. One output for each stereo channel. Note This is only available on single-stream units with the SDI option installed (D9800-3G-SDI).	BNC
AUD 1&2 and AUD 3&4 (Balanced Audio Outputs)	Audio 1&2 and Audio 3&4 provide two stereo pairs or four mono channels. Note The AUD 3&4 outputs are only available on single-stream units with the SDI option installed (D9800-3G-SDI).	Terminal Blocks

Connector	Description	Type
SDI 1 and SDI 2	The SDI outputs provide serial digital video with embedded audio output for applications. The following lists the supported SDI standards: • HD-SDI (SMPTE-292M) • SD-SDI (SMPTE ST 259) • 3G-SDI (SMPTE ST 424) Note This is only available on the single-stream units with the SDI option installed (D9800-3G-SDI).	BNC
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. Note This is available on the single-stream units only.	HDMI Type A receptacle (female)
ASI IN and ASI OUT (D9800-SS) ASI I/O 1 and ASI I/O 2 (D9800-MS)	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
Cue Tone/Cue Trigger Relay Output	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.	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) DATA1 to DATA4 (D9800-MS)	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. 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

Connector	Description	Type
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 2](#). 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 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

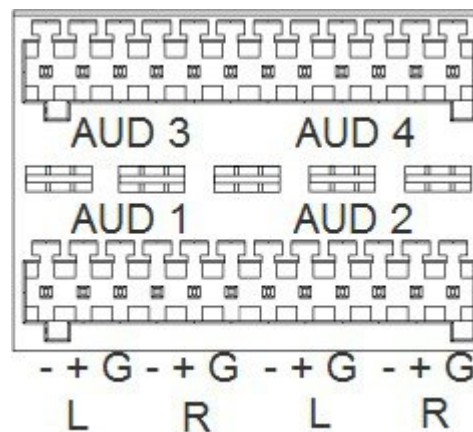
The digital audio output is always 75-ohm single-ended.

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



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.

-
- 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.

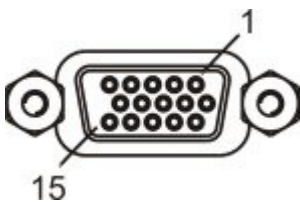
Connector	Closed in Normal Operation	Common Pin	Open in Normal Operation	Relay Mode
	11	10	15	Trigger
	15	10	11	Alarm (default)

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 mAmax. The following table shows the connector and the pin allocation table for Cue Tone, Cue Trigger, and Alarm relay connections.

Connector	Pin	Pin Allocation
	1	Cue Trig 1
	2	Cue Trig 2
	3	Cue Trig 3
	4	Cue Trig 4
	5	Cue Trig 5
	6	Cue Trig 6
	7	Cue Trig 7
	8	Cue Trig 8
	9	Not connected
	10	Alarm - Ground
	11	Alarm - Normally open
	12	Chassis ground
	13	Cue Tone-
	14	Cue Tone +
	15	Alarm - Normally closed

Connecting the Cue Tone Interface

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

Connecting the Cue Trigger Interface

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

Configuring Open-collector Outputs

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

Connecting the Ethernet Management Interface

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

**Note**

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

Step 1

Connect an RJ-45 cable between the Ethernet connector on the D9800 receiver and the Ethernet port of your PC.

Step 2

Set up the IP address on the D9800 receiver via the front panel display (**Setup > IP > IP**).

Viewing the Hardware Information

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

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

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



Upgrading the D9800 Network Transport Receiver

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

- [Setting the Front Panel Download Mode, page 13](#)
- [Downloading and Installing the D9800 Software, page 14](#)
- [Viewing the Download Information, page 14](#)

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

- Step 1** From the D9800 web GUI, choose **Support > Service Actions**.
- Step 2** In the APP/FPGA Downloads area, click **Browse** and choose the new version of the software application.
- Step 3** Click **Download** to download the selected upgrade file. The file format that can be downloaded is Application CDT. During the upgrade, you can click **Return to Browser** (not recommended) to return to the web browser. The application download continues. We do not recommend that you interrupt the upgrade during the application download. Click **Download Status Toggle** to toggle the download data update between the web GUI and an external device.
- For application downloads, once the download is complete, the unit will reboot automatically.

Installing a Preloaded Software Version

- Step 1** From the D9800 web GUI, choose **Support > Service Actions**.
- Step 2** From **S/W Version** drop-down list, choose a different application version for the receiver.
- Step 3** Click **Select & Reboot** to load the selected application version and reboot the receiver.
- Note** To remove the selected application version, click **Erase**. You will be prompted to continue or not. Click **OK** to continue the deletion.

Viewing the Download Information

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

Menu Item	Description
Limit Version	Indicates the oldest version of the application that can be installed on the current unit. Older applications will not be installed.

Menu Item	Description
DL Status	Indicates the current download state. • Init - Download component is being initialized. You cannot perform a download while in this state. • Ready - Download component is ready to receive downloads. • Buffer - Download in progress. The CDTs are being received. • Program - The application is being written to flash. • Swap - The unit is swapping to a new application and it will reboot. • Shutdown - The unit is shutting down and it will reboot. • App Erase - An application is being erased from the flash.
Type	Displays the type of download being performed. • None - No download is being performed. • HTTP - An HTTP download from the web GUI is being performed. • Over Air - An over-the-air download is being performed.
Bank	Indicates the type of code being downloaded.
CDT#	Indicates the total number of expected code tables in the current download.
Recv	Displays the number of code tables received since the last completed or aborted download, or power-cycle.
Reject	Displays the number of code tables rejected. Tables are rejected whenever validation fails due to things like CRC failure or incorrect code or receiver type.

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

CHAPTER 3

Getting Started

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

- [About the Front Panel, page 17](#)
- [Logging on to the D9800 Web GUI, page 23](#)
- [Quick Setup, page 26](#)

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.

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

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.

Front Panel Key	Function
Left arrow	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.
Right arrow	When moving through menus, it highlights the menu item to the right. When entering data, it moves the cursor to the right.
Up arrow	Highlights the menu item above.
Down arrow	Highlights the menu item below.
SELECT	Runs the highlighted command or opens the highlighted menu.
INFO	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.
MENU	Starts the on-screen display, and it also functions as an Escape key, allowing you to back out of menus and data entry fields.
ADV	Toggles between program entry and channel number.
MAP	Allows you to edit, insert, and delete the Digital Program Mapping (DPM) modes on program entries or PIDs within program entries.
APPLY	Saves and applies the setting changes to the receiver.
NAV	For future use.

Numeric Keypad

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

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

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

To delete a character, press 0 twice.

Locking or Unlocking the Front Panel

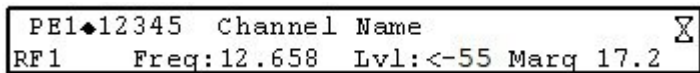
Depending on the default settings, the receiver is shipped with a locked or unlocked front panel. You can lock or unlock the front panel using the front panel keypad or the web GUI.

-
- Step 1** From the D9800 web GUI, choose **System Settings > Front Panel**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Admin > KB Lock**.
- Step 2** Check the **Enable Automatic Front Panel Keyboard Lock** check box or choose the **Enable** front panel menu to lock the front panel. To permanently unlock the front panel, change the KB Lock state to **Disabled** or uncheck the check box.
- Step 3** In the **Keyboard Lock Timeout** field, enter the keypad lock timeout period. The lock timeout period takes effect when the keypad has not been touched (for example, a key has not been pressed) when on the Main Menu for the set period. Avoid setting the period to a short duration when the keypad is used often. Enter a value in the range from 5 to 1800 seconds. The default is 60 seconds.
- Step 4** Press **MENU** until the Startup screen is displayed.
- Step 5** From the Startup screen, press **SELECT**, and then **INFO**.
- Note** If the lock level is 3 or 4, you must enter a password to unlock the front panel.
-

Startup Screen

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

Figure 5: D9800 Startup Screen



```

PE1 12345 Channel Name
RF1 Freq:12.658 Lvl:<-55 Marq 17.2
  
```

The table below describes the parameters displayed on the Startup screen.

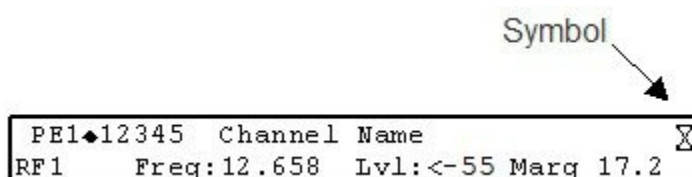
Parameter	Description
PE	Displays the program entry. The receiver supports up to 32 program entries. Single-Stream unit: Only PE1 supports PowerVu descrambling. Do not assign PowerVu channels to PE2 to PE32. If any PowerVu channels are assigned to PE2 to PE32, all Service PIDs associated with these channels will be dropped from the transport output. Multi-Stream unit: All 32 PEs support PowerVu descrambling. You may need the appropriate licenses to permit configuration of channels to the PEs. All 32 program entries can use the Conditional Access Modules (CAMs).
12345	Displays the channel number for program monitoring.
Channel Name	Indicates the name of the monitored program.
RF	Displays the active RF input port. ASI or IP is shown if the ASI or IP port is active.
Freq	Displays the downlink frequency of the tuned signal, in GHz.
Lvl	Displays the signal level, in dBm.
Marg	Indicates the carrier-to-noise (C/N) margin, in dB.
DEGD	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:



The table below describes the symbols.

LCD Symbol	Description
	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.
	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.
	The Download symbol indicates that a software download for a version of software already in memory has been detected.
	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 GUI

-
- Step 1** Open a web browser.
- Step 2** Type the IP address of the D9800 Network Transport Receiver in the address bar and press Enter. You can view and configure the IP address in the following front panel menu: **Setup > IP > IP > IP Address**.
- Step 3** By default, the remote access is set up for a secure HTTPS connection. An untrusted warning message is displayed for you to add the current address as an exception. You must add the current IP address as an exception to access the web GUI. For more information on the HTTP setting, see [Configuring the Remote Access Protocols, on page 114](#).
- Step 4** In the **Username** and **Password** fields, enter the username and password. For the default username and password, contact Cisco Services.
- Step 5** Click **Log In**.
- Note** If you check the **Remember username** check box, the user name will be remembered the next time you log into the web GUI.
-

Changing the Login Password

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

-
- Step 1** From the D9800 web GUI, 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 GUI Environment

The following is an example of the D9800 web GUI page:

Figure 6: D9800 Web GUI

SI Receive Setup

Number of alarms, warnings, and clear messages

Custom Tuning Mode
Set custom tuning parameters below.

Acquisition Mode: Basic Configure Custom SI Recv

Stream Tuning Mode affects which SI is used to tune and provide channel list.

Network ID: 1
This value is used to select the Network Information Table

CA Mode: Std

SI Receive Status		Service List From	
Frequency Tuning Mode	User Cfg	BAT	No
Service List Mode	Degraded	NIT	Yes
Source of Last Tuning	User_Change	SDT	Yes
Acquisition State:	None	PAT	Yes
TS ID			
Network ID	1		

Displays as you edit the pages. Changes are applied on the receiver only (not on the uplink).

Apply Refresh

Locally Modified Data
Click 'Apply' button below to store changes.

The following table displays the general buttons on the D9800 web GUI.

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

Alarms/Warnings

The top right corner of the D9800 web GUI displays the total number of active alarms () , active warnings () , and clear messages (). Clear messages is calculated as follows: total number of alarms + total number of warnings - total number of active alarms - total number of active warnings.

To view a detailed list of alarms and warnings, click the Alarms or Warnings link and a pop-up window is displayed with a list of all the active alarms or active warnings. Click an alarm or warning to open the Status page for more information.

Viewing the Summary Overview

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

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

The table below describes the available modules.

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

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.

Quick Setup

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

Task	Description
Setting up the Network Connection, on page 28	Set up the network connection.
Tuning to an RF Input, on page 37, Tuning to the ASI Input, on page 44, or Tuning to the MPEGoIP Input, on page 46	Acquire and configure one of the following inputs: RF, ASI, or IP.
Assigning a Channel to a Program Entry, on page 55	Assign a program channel to a program entry.
Configuring the ASI or MPEGoIP Output General Settings, on page 87 and Configuring the ASI or MPEGoIP Output Mode, on page 88	Set the following ASI output parameters: • Output Mode - We recommend to set it to MAP Service Channels Only. Select Yes if requested to Resync All. • Descramble Mode • Insert Null Packet - Set to Yes.
Configuring the SDI Outputs, on page 75	Choose the SDI1 and SDI2 outputs. The SDI outputs are only available on units with the SDI option installed (D9800-3G-SDI).
Configuring the ASI or MPEGoIP Output General Settings, on page 87 and Configuring MPEG over IP or IP Data Streams, on page 107	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.
Typical Digital Program Mapping Setup, on page 98	Set the DPM mode.



Administrative Settings

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

- [Setting up the Network Connection, page 28](#)
- [Managing the Web GUI Accounts, page 28](#)
- [Configuring Lock Level Settings, page 30](#)
- [D9800 Receiver Factory Reset, page 31](#)
- [Rebooting the D9800 Receiver, page 31](#)
- [Importing/Exporting D9800 Settings File, page 32](#)
- [Viewing the D9800 Usage Information, page 32](#)
- [Viewing Operating Board Temperatures, page 33](#)
- [Viewing the D9800 System Information, page 34](#)
- [Viewing Hardware Features and Software License Information, page 34](#)
- [Configuring the Time/Clock Settings, page 34](#)
- [Viewing the System Version Information, page 35](#)
- [Viewing the D9800 Hardware Version Information, page 35](#)
- [Viewing Diagnostic Logs, page 36](#)
- [Exporting Debug Support Data, page 36](#)
- [SSH Access for D9800 Support, page 36](#)

Setting up the Network Connection

-
- Step 1** From the Main Menu of the D9800 front panel, choose **Setup > IP > IP**.
- Step 2** Choose **IP Address**, **Mask**, and **Gateway** menus and use the number keys to enter the IP network information.
- Step 3** Press **APPLY**.
-

Managing the Web GUI Accounts

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

When a user tries to log in, the user is required to provide a username and a password. The user is granted access only if this username/password pair exists in the authentication table.

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

Changing the Password Complexity

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

Password	Description
No Checking	There are no restrictions on passwords. A minimum of one character is required.
Minimal Checking	A password must comply with the following requirements: • It cannot contain username or reversed username. • It cannot contain any of the following strings: cisco, sciatl, ocsic, Itaics, atlsci, icslta, or any string achieved by full or partial capitalization of letters. • No letter is repeated more than three times in a row. • Must contain a minimum of four characters.

Password	Description
Full Complexity Checking	A password must comply with the following requirements: • It cannot contain username or reversed username. • It cannot contain any of the following strings: cisco, sciatl, ocsic, Itaics, atlsci, icslta, or any string achieved by full or partial capitalization of letters. • No letter is repeated more than three times in a row. • Must contain a minimum of eight characters. • Must contain a minimum of three of the following types of characters: capital letters, small letters, digits, and special characters.

Note The complexity level changes will only affect the new user accounts and password changes. It will not affect existing passwords.

Adding a New User Account

-
- Step 1** Ensure that you are logged in to the D9800 web GUI with admin privileges.
- Step 2** Choose **System Settings > Account Management**, and click the **Manage User Logins** link.
- Step 3** Click **Add Account Login**.
- Step 4** In the **Username** field, enter a user ID. The new username should not match any of the usernames already defined in the **Logins Account** area.
- Step 5** In the **New Password** field, enter a password to assign the user ID. The password must follow the rules configured in the Password Complexity parameter. For more information, see [Changing the Password Complexity, on page 28](#).
- Step 6** Enter the new password again to confirm in the **Confirm New Password** field. The New Password and Confirm New Password should be identical.
- Step 7** In the **Administrator Password** field, enter your Administrator password used to log in to the web GUI.
- Step 8** From the **Account Type** drop-down list, choose a login types:
- Guest - View settings only.
 - User - View and edit settings.
 - Admin - View, edit settings, and add/delete user accounts.
- Step 9** Click **OK**.
-

Deleting a User Account

-
- Step 1** Ensure that you are logged in to the D9800 web GUI with admin privileges.
- Step 2** Choose **System Settings > Account Management**, and click the **Manage User Logins** link.
- Step 3** In the **Login Accounts** area, click the radio button of the user account you want to remove and click **Delete Account Login**.
- Step 4** In the **Administrator Password** field, enter the Administrator password and click **OK**.
-

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.

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

-
- Step 1** From the D9800 web GUI, choose **System Settings > Lock Level Settings** and click **Change Lock Level**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Admin**.
- Step 2** From the **Lock Level** drop-down list or front panel menu, choose the lock level that restricts access and prevents unauthorized changes to the receiver settings (0, 1, 2, 3, or 4). The table above describes each level. The default setting is 0.
- Step 3** In the **Enter Password to change the Lock Level** field, or use the right arrow key to select the **Password** menu, enter the password to change the lock level. For details on the default password, contact Cisco Services.
- Step 4** Click **OK** or press MENU until it prompts you to save your changes.
-

Changing the Lock Level Password

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

**Caution**

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

-
- Step 1** From the D9800 web GUI, choose **System Settings > Lock Level Settings** and click **Change Lock Level Password**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Admin**.
- Step 2** In the **Enter Current Password** field or the **Old Pwd** front panel menu, enter the current password.
- Step 3** In the **Enter New Password** field or the **New Pwd** front panel menu, enter the new password.
- Step 4** In the **Re-enter New Password** field or the **Confirm Pwd** front panel menu, enter the new password again.
- Step 5** Click **OK** or press **MENU** until it prompts you to save your changes.
-

D9800 Receiver Factory Reset

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

-
- Step 1** From the D9800 web GUI, choose **Support > Service Actions**, or, from the Main Menu of the D9800 front panel, choose **Setup > Admin**.
- Step 2** Click **Factory Reset**, or choose the **Factory Reset** front panel menu.
- Step 3** Confirm the factory reset.
-

Rebooting the D9800 Receiver

-
- Step 1** From the Main Menu of the D9800 front panel, choose **Setup > Admin**.
- Step 2** Use the down arrow key to scroll and select **Reboot**.
- Step 3** Select **Continue** to confirm the reboot.
-

Importing/Exporting D9800 Settings File

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

Exporting the D9800 Settings File

-
- Step 1** From the D9800 web GUI, choose **System Settings > Settings File**.
- Step 2** In the **Device Settings File Transfer** area, click the **Export Device Settings & Transport Network Information** radio button to download device settings and transport network information as a file to the designated file folder, or click the **Export User Device Settings Only** radio button to download user settings as a file to the designated file folder.
- Step 3** Click **Export**.
- Step 4** Save the settings file to a local folder.
The **Settings File Backup History** area displays the name, date, and time of the last file that was successfully exported.
-

Importing the D9800 Settings File

-
- Step 1** From the D9800 web GUI, choose **System Settings > Settings File**.
- Step 2** In the **Settings File** area, click **Browse** and choose the settings file you want to import.
- Step 3** Click **Open**.
- Step 4** Click **Import**. The **Settings File Restore History** area displays the name, date, and time of the last file that was successfully imported.
-

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.

Web GUI Parameter	Front Panel Menu	Description
Production Date & Time	Creation Date and Time	Displays the date and time when the receiver was manufactured.

Web GUI Parameter	Front Panel Menu	Description
Last Power On Date and Time	Power On Date and Time	Displays the date and time when the receiver was powered up.
Lifetime Hours Powered	Total Hrs	Displays the number of hours the current unit has been running since it was manufactured.
Lifetime Reset Counter	Tot Rst #	Displays the total number of times the receiver has been restarted since it was manufactured.
Clearable Reset Counter	Clrbl Rst #	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.
Hours Since Last Powered-On/Reset	Hrs Since Last Pwroff	Displays the total number of hours that the receiver has been operating since the last power-on or restart.
Last Reset Reason	Reason For Last Reset	Displays the reason for the last restart, for example, power cycle or manual reset.

Viewing Operating Board Temperatures

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

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

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

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

Viewing the D9800 System Information

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

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

Viewing Hardware Features and Software License Information

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

The **Hardware Features** area, or the **Features** front panel menu, displays the hardware options installed on the current D9800 Network Transport Receiver. For example, it indicates whether the receiver is equipped with an SDI output. The **Multi-Stream** displays whether the current unit is a multi-stream unit (Yes), or a single-stream unit (No). The **Transcoder Available** field indicates the number of transcoders installed on the current multi-stream unit. The **HEVC Processing** field indicates the number of HEVC processors installed on the current multi-stream unit.

The **Feature License Summary** area, or the **Licenses** front panel menu, displays a list of installed software licenses on the D9800 Network Transport Receiver, license count (if applicable), and/or whether each of the software licenses are enabled or disabled.

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.

Configuring the Time/Clock Settings

-
- Step 1** From the D9800 web GUI, choose **System Settings > Time/Clock**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Admin**.
 - Step 2** From the **Date Format** drop-down list or front panel menu, choose the date format of the receiver. The following formats are supported: YYYY_MM_DD, DD_MM_YYYY, MM_DD_YYYY.
 - Step 3** From the **Time Format** drop-down list or front panel menu, choose the time format of the receiver. Current time information is normally broadcast as part of the transmitted digital signal. It is broadcast as GMT (Greenwich Mean Time) with date information in Modified Julian Date format. The following formats are supported: 24Hr, 24 Hr

SuspendZero (the leading zero is dropped from the time), 12Hr, 12Hr SuspendZero (the leading zero is dropped from the time).

- Step 4** From the **GMT Offset** drop-down list or the **GMT Off** front panel menu, choose the GMT offset time. The local time is displayed using a time zone (GMT offset). If your local time is not GMT, you must set this time setting in the range from -12.0 to +12.0 hours in 0.5 hour increments.
- Step 5** The **Current TDT Time/Date** field or front panel menu (**Status > General**) displays the current Time and Date Table (TDT) date and time received from the DVB stream. This is displayed as local time.
- Step 6** Check the **Enable NTP Time Service** check box, or choose Yes in the **NTP Enable** front panel menu (**Setup > IP > IP**), to periodically request NTP (Network Time Protocol) timestamps from the NTP server (NTP server address set below) and to synchronize its system (for example, non-DVB related) time with the NTP server. This is displayed as local time.
- Step 7** In the **NTP Server Address** field, or the **NTP Server** front panel menu (**Setup > IP > IP**), enter the IP address of the NTP server. If the NTP server address is not set (0.0.0.0), the unit will not attempt to connect to the server.
- Step 8** The **Current NTP Time/Date** field, or **Current NTP Date and Time** front panel menu (**Status > General**) displays the current time of the unit when it receives a valid reply from the NTP server, adjusted for local time zone.
- Step 9** Apply the changes.
-

Viewing the System Version Information

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

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

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

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

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

The **APP/FPGA Downloads** area allows you to download and install the D9800 software. For more information, see [Downloading and Installing the D9800 Software](#), on page 14.

Viewing the D9800 Hardware Version Information

From the D9800 web GUI, choose **System Settings > Decoder or Transcoder** (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 - Current Versions** area displays the version number of the main decoder board (NDM) or the main transcoder board (NTM).

The **Decoder/Transcoder - Firmware Versions** area displays the FPGA, boot, BOLT, and Eeprom version numbers of the main decoder board, or the FPGA, and Eeprom version numbers of the transcoder board.

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

Viewing Diagnostic Logs

From the D9800 web GUI, choose **Support > Diagnostic Logs**.

The Diagnostic Logs page displays all the system log messages with their dates and times. Click the arrow next to **Set Date and Time** column to sort by date and time.

Click **Clear** to clear the log history.

Exporting Debug Support Data

**Note**

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

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

Step 2 Click **Export**.
A diagnostics file is created and saved.

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.



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, page 37](#)
- [Tuning to the ASI Input, page 44](#)
- [MPEGGoIP Input, page 45](#)
- [Tuning to the MPEGGoIP Input, page 46](#)
- [Viewing the Current Input Status, page 50](#)
- [Setting Up the Tuning Information, page 50](#)
- [Setting Up Muting Thresholds Controls, page 53](#)
- [Assigning a Channel to a Program Entry, page 55](#)
- [Viewing Incoming Stream Details, page 58](#)
- [Configuring the Common Interface \(CI\) Information, page 61](#)
- [Viewing the Conditional Access Status, page 64](#)

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

Step 1 Do one of the following:

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

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

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

Note Setting a new input to be active will deactivate the current active input. To view the current active input, click the **IP** tab and refer to the **Current Input Status** area.

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

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

For more information on configuring the tuning parameters, see [Configuring the RF Tuning Parameters, on page 38](#) and [Setting the RF LNB Configuration, on page 40](#).

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 55](#). 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

Step 1 Do one of the following:

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

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

- Step 2** In the **Downlink Frequency** field, or the **Freq** front panel menu, enter the current operating downlink frequency used by the receiver for tuning the received digital signal. You can enter a value in the range from 0.0 to 15.0 GHz.
- Step 3** In the **Symbol Rate** field, or the **SymRate** front panel menu, enter the symbol rate. The symbol rate must match that of transmitted signal. You can enter a value in the range from 1.0 to 45.0 Ms/s for DVB-S, 1.0 to 30.0 for DVB-S2 if Pilot Present is set to Yes on the front panel, or 5.0 to 30.0 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. 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.
- 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**.
- 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

-
- Step 1** Do one of the following:
- Web GUI: From the D9800 web GUI, choose **Input > Input Setup > RF** tab.
 - Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > RF1, RF2, RF3, or RF4**
 - Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > RF**, and choose the RF input you want to configure from the **RF** front panel menu.
- Step 2** In the **LO1 (Ghz)** field or the front panel menu, set the lower local oscillator frequency, in GHz, of the LNB. If it is a single band oscillator, set its frequency, in GHz. You can enter a value in a range from 0.0 to 15.0 GHz. This value must be lower than the value for LO2.
- Step 3** In the **LO2 (Ghz)** field or front panel menu, set the higher oscillator frequency, in GHz, of the LNB. If it is a single band oscillator, set this value to 0.0. You can enter a value in a range from 0.0 to 15.0 GHz. This value must be higher than the value for LO1. In single-band LNB applications, set this value to 0.0.
- Step 4** In the **Crossover** field or front panel menu, enter the crossover frequency for RF1, RF2, RF3, and/or RF4. This is an internal threshold frequency used for selecting the LO1 or LO2 frequency, depending on the current downlink frequency settings. This option is only used in dual-band LNB applications. You can enter a value in a range from 0.0 to 15.0 GHz. In a single-band LNB applications, set this value to 0.0.
- Step 5** From the **Polarisation** drop-down list, or the **Pol** front panel menu, choose the signal polarisation setting (Horizontal, Vertical, or Automatic). This setting is only applicable when the LNB Power is set to H-NIT or V-NIT. It marks the polarity of the signal connected to the current RF input.
- Step 6** In the **Orbital Posn** field, set the orbital position of the RF input, in degrees. This is the location in orbit of the satellite currently being used. The satellite position (in degrees) in combination with the direction (either E (East) or W (West)) denotes the satellite position the dish connected to the current RF Input should point. This is used when the satellite is not available in the look-up menu list.
- For the front panel, choose **Satellite** to set the satellite you want to use to receive the signal from the list of available satellites. When you choose the satellite, the orbital position is displayed. This is important for automatic switching from one RF input to another in the event of loss of the signal, allowing the receiver to acquire an alternate signal. If the satellite is not listed, enter the known orbital position (**OrbPos**) of the satellite you want to use to receive the signal. For manual configuration, enter the location of the satellite using the numerical keypad. The receiver will not recognize the satellite name and identify it as Unknown.
- Note** The Validate Orbital Position feature is not supported in the current release.
- 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.
- Step 8** Apply your changes.
-

Reacquiring the Network Information

- Step 1** From the D9800 web GUI, choose **Input > Input Setup > RF** tab and click **Reacquire**, or choose **Setup > TS Input > Re-acquire** from the Main Menu of the front panel to re-acquire the signal using the tuning parameters from user settings.
- Step 2** Check the **Reacquire Tuning & Channel List Only** check box and click **OK** for the receiver to tune back to the user configured input and frequency and re-acquire the PSI/SI information back to the selected channel. This operation can take several minutes, depending on the size of the network.
- The current **Acquisition State** is displayed for the RF and ASI inputs in the **RF** and **ASI** tabs on a single-stream unit, or the **Active Inputs** page on a multi-stream unit.
- To view the acquisition status on the front panel, choose **Status > TS Input > Input > Tune Mode** from the Main Menu. The status displays Full if the SI and PSI tables have all been found. Otherwise, it will display Degraded if there are missing tables or None if no SI or PSI tables have been found.

Viewing the RF Tuning Status

From the D9800 web GUI, choose **Input > Input Status > 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. From the Main Menu of the D9800 front panel, choose **Status > TS Input > Input > RF**.

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

Web GUI field	Front Panel menu	Description
Frequency (GHz)	Dnlnk Freq (GHz)	The current downlink frequency, in GHz.
L band Freq. (MHz)	L-Band	The current L-Band frequency, in MHz.
Symbol Rate (Msym)	SymRate	Symbol rate of the received signal, in Msymbols/second.
FEC Rate	FEC	The FEC (Forward Error Correction) rate of the received signal.
Signal Status	Status	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.

Web GUI field	Front Panel menu	Description
AFC (MHz)	AFC (MHz)	Indicates the current Automatic Frequency Control count, in MHz.
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.
Orbital Validation Status	—	This is not supported in the current release.
Orbital Validation Date	—	This is not supported in the current release.
—	Level (dBm)	Indicates the signal level of the received signal, in dBm.
Modulation Type (multi-stream units only)	Modulation	Indicates the modulation type for the received signal (N/A, QPSK, 8PSK, DVB-S, DVB-S2 or 16QAM).
—	Pol	Indicates the signal polarization setting. This setting is only applicable when LNB Power is set to H-NIT or V-NIT. The selected setting must match the polarization of the transmitted signal (Horiz (Horizontal), Vert (Vertical) or Auto).
—	IQ Tuner	Indicates the IQ (Input Signal Inversion) for the received signal (Inv or NonInv).
IQ (multi-stream units only)	IQ Status	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).
—	Rolloff	Displays the rolloff factor of the incoming signal.
Pilots (multi-stream units only)	Pilot Present	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).
—	C/N (dB)	Indicates the current Carrier-to-Noise ratio, in 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.

Web GUI field	Front Panel menu	Description
PACKET ER (multi-stream units only)	PER	Indicates the current PER (Packet Error Rate) of the received signal (DVB-S2).
PV BER (multi-stream units only)	PVBER	Indicates the PV (Post-Viterbi) BER for the received signal (DVB-S).
LDPC ER (multi-stream units only)	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.
—	Net Name	Indicates the name assigned to the network.
—	NetID	Indicates the network ID of the uplink signal the receiver is to receive when using the selected preset (1 to 65535). The receiver's Network ID 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).
—	TxID	Indicates the Transport ID (1 to 65535).
LNB Status (multi-stream units only)	LNB Stat	Indicates the current Low Noise Block (LNB) connection status (No Load, Over Loaded, Over Temperature, Short Circuit, Disabled, Normal, or N/A).
—	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

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- Step 1** From the D9800 web GUI, choose **Input > Input Setup > ASI** tab. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > ASI**.
- Step 2** If you are activating the ASI input on a single-stream unit, check the **Use ASI 1 Input** check box to tune to the ASI 1 input. Or, choose **ASI Active > Act** from the front panel.
- Note** Setting a new input to be active will deactivate the current active input.
- A multi-stream unit has two ASI input/output ports. If you are activating the ASI input(s) on a multi-stream unit, check the **Use ASI 1** and/or **Use ASI 2** check box. Or, choose the 1 or 2 from the **ASI** front panel menu, and then choose Yes from the **Active** menu.
- Step 3** The **Configured As** front panel menu indicates whether the current ASI port is configured as an input port, output port, or none.
- Step 4** Apply your changes.
-

Viewing the ASI Input Status

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

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

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

Web GUI field	Front Panel menu	Description
Active Input (single-stream units only)	—	Indicates the active input port receiving the signal (RF1, RF2, RF3, RF4, ASI, or IP).
Signal Status	Status or Lock	Indicates whether the input signal is locked. • Locked - Indicates the receiver is locked to a carrier with no valid content. • Lock+Sig - Indicates the receiver is locked to a carrier with valid content. • No Lock - Indicates the receiver is not locked to a carrier.

Web GUI field	Front Panel menu	Description
Input Rate (Mbps)	Rate (Mbps)	Indicates the bit rate of the input transport stream, in Mbps.
ASI Link	ASI Link (single-stream units only)	Indicates whether there is a transport stream link error (Error, Ok, or N/A).
ASI Transport	Transport	Indicates the current transport synchronization status (Error, Ok, or N/A).
ASI Packet Size (bytes)	Packet Size (single-stream units only)	Indicates the packet size (in bytes) for the ASI input (188, 204, or N/A).
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 (single-stream units only)	TxID	Indicates the Transport ID (1 to 65535).
Input Activation Status (multi-stream units only)	Status > TS Input > Input > ASI > Active	Indicates whether the current ASI input is activated (Yes or No).

MPEGoIP Input



Note

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

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

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



Tuning to the MPEGoIP Input

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

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- Step 1** From the D9800 web GUI, choose **Input > Input Setup > IP** tab. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > IP**.
- Step 2** In the **MOIP Input Selection** area, check the **Use MOIP Input** check box, or from the **IP1 Active** front panel menu, choose **Act** to tune to the MPEG over IP Input.
- Note** If you are activating the MOIP input on a single-stream unit, setting a new input to be active will deactivate the currently active input. A multi-stream unit allows multiple active inputs.
- Step 3** From the **Source IP 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. Choose **SW Map** to automatically detect and select which stream to tune to, or **UserCfg** to lock to the source IP input set by the user.
- Step 4** If **UserCfg** is set as the **Source IP Selection Mode**, click **User Selected Source IP**, or choose the **DATA1/DATA2** front panel menu, to select the Data 1 or Data 2 streams. When selecting Data 1 or Data 2 on the web GUI, the Source IP Address displays the host (originator) IP address of the incoming stream, and the Present columns display whether the stream is present on the Data 1 and Data 2 ports.
- Step 5** Apply your changes.
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Configuring the MPEG over IP Input

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- Step 1** From the D9800 web GUI, choose **Input > Input Setup > IP** tab, and refer to the **MOIP Flow Configuration** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > IP**.
- Step 2** 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 3** If **Multicast** is selected, enter the multicast destination IP address in the **Multicast Address** field (or choose the **IP Address** front panel menu).
- Step 4** 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. Choose **1D** if the FEC column stream is expected or **2D** if FEC column and row streams are expected. Otherwise, choose **None** to drop all the FEC streams.
- Step 5** In the **TS Destination 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 6** 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 **FEC Columns Port** 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 FEC Rows Port field (2 to 65534, even only). We recommend that you set the rows port number to TS Destination Port + 4.

Step 7 From the **Source Filter** drop-down list, or the **Src Filter** front panel menu, choose the source (host) filtering mode. This only applies to IGMP v3.

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

The incoming streams are always filtered based on user-configured destination information (destination IP address and UDP ports). In addition, they can be filtered based on selected Source Filter mode.

The list of hosts/servers is defined in the Source Filter Setup window. To define the hosts/servers:

- 1 Click **Source Filter Setup**, or choose the **Idx** front panel menu.
- 2 Click the + icon, or press the ADV key and choose **Insert** on the front panel.
- 3 If **White List** is set as the **Source Filter**, enter the IP address of a trusted server the unit is allowed to receive streams. The unit is allowed to receive streams from servers with IP addresses listed here. If **Black List** is set as the **Source Filter**, enter the IP address of a server that is not trusted. The unit is allowed to receive streams from any server, except for the servers with IP addresses listed here.
- 4 Click **Save** and then **OK**. You can add up to 8 IP addresses.

Step 8 Apply your changes.

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.

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 GUI, choose **Input > Input Setup > IP** tab, and refer to the **De-Jitter Configuration** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > IP**.
- Step 2** From the **Algorithm** drop-down list or front panel menu, choose the de-jittering algorithm (VBR or CBR).
- Step 3** 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.

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 Configuration** area allows 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.

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- Step 1** From the D9800 web GUI, choose **Input > Input Setup**, click the **IP** tab, and refer to the **Redundancy Configuration** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Input > IP**.
- Step 2** From the **Mode** drop-down list, or the **Redundancy Mode** front panel menu, choose the redundancy mode for MPEG over IP input data. If the backup port is in a failed state, a failover will not occur. Choose one of the following:
- **Manual: Data1 or Manual: Data2** - Use DATA 1 or DATA 2 port for input data. The remaining redundancy controls below are not applicable.
 - **Backup: Primary Data1 (default) or Backup: Primary Data2** - Use DATA 1 or DATA2 port as the primary data port and if one or more of the selected triggers occur, it will failover to the backup port. The backup port is the port that not used as the primary port. For example, if Data 1 is used as the primary port, Data 2 is the backup port. Configure the following redundancy controls:
 - 1 From the **Type** drop-down list or front panel menu, choose the redundancy direction. Choose **Revertive** to attempt to revert back to the primary port when using the backup port and the primary port is active again. In the **Revertive Delay** field or front panel menu, set the time to wait before reverting back to the primary port once all the triggers for the primary port are back to normal again, in a range from 0 to 30 seconds.
Choose **Non-Revertive** to use the backup port (if active) when the primary port fails, without reverting back to the primary port under any circumstances.
 - 2 In the **Direct Delay** field or front panel menu, set the time to wait before switching from the primary to backup data port after the system detects a failure on the primary port. You can enter a time in the range from 0 to 10000 milliseconds.
 - 3 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**, or **PCR Loss** check box (or choose Yes for the A/V Trigger, Prog Trigger, or PCR Trigger front panel menu) to detect the status of the audio/video, PMT, 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.

Note If **Revertive** is selected as the **Type**, and all the triggers are selected, it will failover to the backup port when any of the triggers occur and the backup port has valid content. However, it will not attempt to revert back to the primary port when the primary port is available again. It will remain on the backup port. This avoids the constant switching between the two ports since the incoming packet streams cannot be validated until the switch is made.

Step 3 Apply the changes.

Viewing the IP Input Status

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

For information on the Signal Status, Input Rate, and Acquisition State statuses, see [Viewing the RF Tuning Status, on page 41](#) and [Viewing the ASI Input Status, on page 44](#).

The following table describes the current input status information displayed:

Web GUI Field	Front Panel Menu	Description
Link Status	—	Displays the link status of the active data port (Up or Down).
Transport Stream ID	—	The Transport ID (in the range from 1 to 65535).
Locked Data1/Data2 Source IP	IP Source > Data1/Data2 Source Host and MOIP Type	When locked, this displays the source/host IP address of the originator. If the signal is not locked, it will display N/A.
Port In Use	Redundancy > Port In Use	Displays the current input port in use (Data1 or Data2).
Switchover Reason	Redundancy > Change Reason	Displays a description of the reason for the last redundancy switchover (Setup, EthLinkStatus, TS Status, ProgStatus, or None).
Switchover Date/Time	Redundancy > Change Date & Time	Displays the last date and time for the last redundancy switchover.
PCR Lock	—	Indicates whether the system is locked to the required PCR PID (Yes or No).
De-jitter Latency (msec)	—	Displays the overall transport stream buffer latency, in milliseconds.
FEC Bitrate (Mbps)	FEC > FEC Rate	Displays the input stream bit rate reported by the FEC decoder.

Web GUI Field	Front Panel Menu	Description
FEC CEC	FEC > CEC	Indicates the current Corrected Error Count for the received stream.
FEC PER	FEC > PER	Indicates the current Packet Error Rate of the received stream.
FEC Rows/Col	FEC > FEC Rows/Col	Displays the number of FEC rows and columns (0 to 20).
Present	FEC > Present	Indicates whether the FEC row or column streams are present.
FEC Overhead	FEC > FEC Overhead	Displays the FEC overhead, compared to the transport stream bit rate, in percentage.
FEC Latency	FEC > Latency (ms)	Displays the delay that is introduced by the FEC decoder, in milliseconds.

Viewing the Current Input Status

To view the current input status on a single-stream unit, do the following:

From the D9800 web GUI, choose **Input > Input Status**.

The **Input Status** area displays the same information shown in the Input Setup page. For more information, see [Viewing the RF Tuning Status, on page 41](#), [Viewing the ASI Input Status, on page 44](#), and [Viewing the IP Input Status, on page 49](#).

The **Tuner Performance** area displays the satellite dish information, such as the C/N Margin and Signal Level. For more information, see [Viewing the RF Tuning Status, on page 41](#).

To view the current input status on a multi-stream unit, do the following:

- 1 From the D9800 web GUI, choose **Input > Active Inputs**.
- 2 In the **Input** column, click the radio button of the input you want to view status.
- 3 Click the **Input Status** tab.

The columns display the input status shown on the Input Setup page. For more information, see [Viewing the RF Tuning Status, on page 41](#), [Viewing the ASI Input Status, on page 44](#), and [Viewing the IP Input Status, on page 49](#).

Setting Up the Tuning Information

Step 1 If you are configuring the tuning information on a single-stream unit, do the following:

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

If you are configuring the tuning information on a multi-stream unit, do the following:

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

Step 2 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 3 From the **CA Mode** drop-down list (or **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 4 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 51](#).

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 5 Apply your changes.

Customizing the SI Receive Settings

Step 1 If you are customizing settings on a single-stream unit, do the following:

a) From the D9800 web GUI, choose **Input > SI Receive Setup**. Or, from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Tune Mode > Custom**.

b) Ensure the **Acquisition Mode** is set to **Custom** and click **Configure Custom SI Recv**.

If you are customizing settings on a multi-stream unit, do the following:

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

b) 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.

c) Click **SI Receive Setup**.

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

Step 2 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 3 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. Degraded requires any service list table to be present to acquire the signal.

Step 4 Refer to the **Service List Contributors** area.

Step 5 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 6 Click **OK** and apply your changes.

Viewing the Tuning Status

If you are viewing the tuning status on a single-stream unit, do the following:

From the D9800 web GUI, choose **Input > SI Receive Setup**, or from the Main Menu of the D9800 front panel, choose **Setup > TS Input > Tune Mode > Status**. The **SI Receive Status** and **Service List From** areas or the **Status** front panel menu displays all the current SI Receive Settings.

If you are viewing the tuning status on a multi-stream unit, do the following:

- 1 From the D9800 web GUI, choose **Input > Active Inputs**.
- 2 From the **Input** column, click the radio button of the input you want to view the tuning status.
- 3 Click the **SI Status** tab.

Or, from the D9800 front panel, choose **Status > TS Input > Input > Tune Mode**, and choose the input you want to view the tuning status from the **Input** menu.

The table below describes the SI and service information displayed.

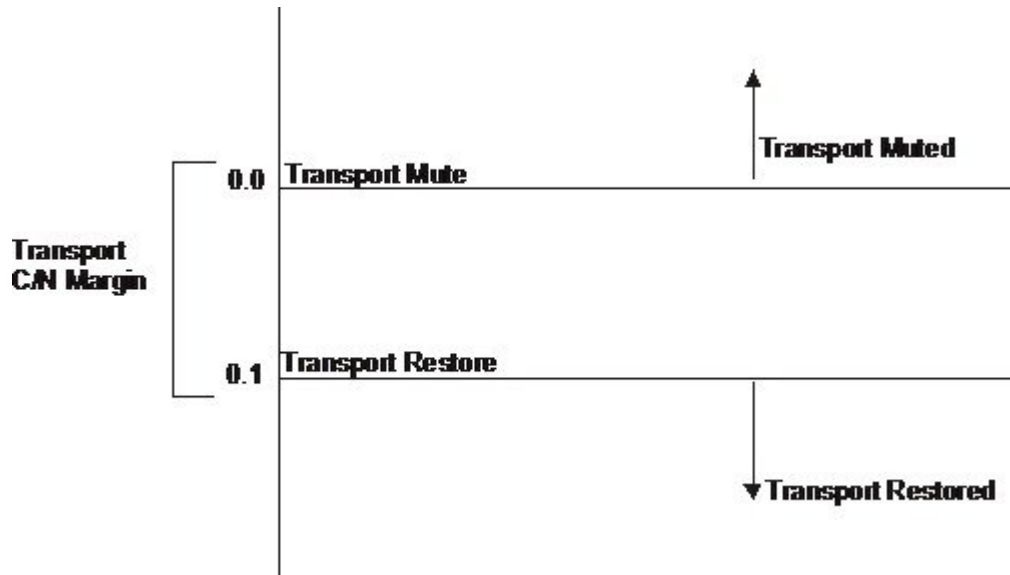
Web GUI/Front Panel Menu	Description
Service List Mode	Indicates if all the expected service list tables are present (Rigorous) or only some of the service list tables are present (Degraded).
Frequency Tuning Mode	Indicates whether tuning is using the NIT to tune to other transports, or whether tuning is forced to use the user selected parameters.
Source of Last tuning or Tune Reason	Indicates how the tuning parameters were last saved.
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 and Network ID	Displays the transport and network ID number.
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.

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.

-
- Step 1** From the D9800 web GUI, choose **Input > Muting Thresholds**, or from the Main Menu of the D9800 front panel, choose **Setup > NoiseCutoff**.
- Step 2** Check the **Enable Threshold Muting** check box (or choose the Muting Control front panel menu and choose Enable) to mute the transport stream and audio, in the event of an unstable, poor, or loss of signal condition. The default is checked or enabled.
- Step 3** The **Transport Mute** for both **DVB-S C/N Margin (dB)** and **DVB-S2 C/N Margin (dB)** (or the **Trnsprt(DVBS Marg) 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 on the web GUI or the **Muting Control** front panel menu must be checked or enabled for these settings to be active.
- Step 4** The **Transport Restore** for both **DVB-S C/N Margin (dB)** and **DVB-S2 C/N Margin (dB)** (or the **Trnsprt (DVBS Marg) Restore** and **Trnsprt(DVBS2 Marg) Restore** front panel menus) sets the DVB-S and DVB-S2 Carrier to Noise margins, in dB, above the transport outputs that will be muted. The receiver uses these thresholds to determine when to restore the transport after it has been muted. The adjustable operating range is from -30.0 to 30.0 dB. This setting must be above the respective Mute value. The default setting is 0.1.
Note The **Enable Threshold Muting** check box on the web GUI or the **Muting Control** front panel menu must be checked or enabled for these settings to be active.

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



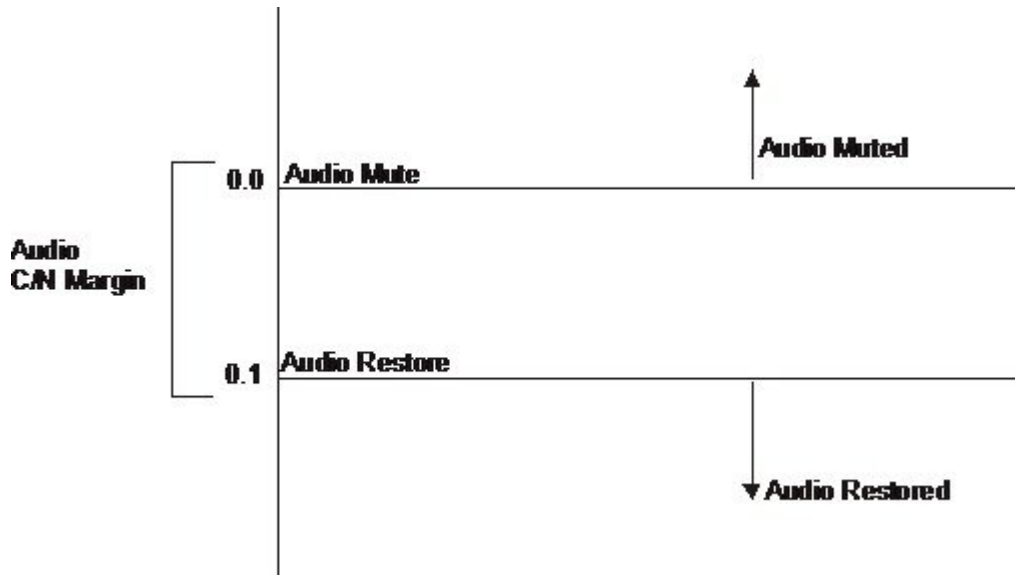
- Step 5** The **Audio Mute** for both **DVB-S C/N Margin (dB)** and **DVB-S2 C/N Margin (dB)** (or the **Audio(DVBS Marg) Cutoff** and **Audio(DVBS2 Marg) Cutoff** front panel menus) sets the DVB-S and DVB-S2 Carrier to Noise margins, in dB, below the audio outputs that will be muted. The receiver uses these thresholds to determine when to mute the audio in the event of a noisy, poor, or loss of signal condition. The adjustable operating range is -30.0 to 30.0 dB. This setting must be below the respective Restore value. The default setting is 0.0.

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

- Step 6** The **Audio Restore** for both **DVB-S C/N Margin (dB)** and **DVB-S2 C/N Margin (dB)** (or the **Audio(DVBS Marg) Restore** and **Audio(DVBS2 Marg) Restore** front panel menus) sets the DVB-S and DVB-S2 Carrier to Noise margins, in dB, above the audio outputs that will be restored. The receiver uses these thresholds to determine when to restore the audio after it has been muted. The adjustable operating range is from -30.0 to 30.0 dB. This setting must be below the respective Mute value. The default setting is 0.1.

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

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



Step 7 Apply your changes.

Restoring to Default Muting Thresholds

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

Assigning a Channel to a Program Entry

Only PE1 supports PowerVu descrambling. Do not assign PowerVu channels to PE2 to PE16 on a single-stream unit, or PE2 to PE32 on a multi-stream unit. If any PowerVu channels are assigned to PE2 to PE16 or PE32, all service PIDs associated with these channels will be dropped from the transport output.

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

- From the D9800 web GUI, choose **Input > Channel Selection**.
- On a single-stream unit, the **Input** column displays which input is used (RF, ASI, or IP). 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:

- 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.
- Press **ADV** to choose the program entry.
- 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.
- Press **ADV** again to choose the channel number.
- Directly enter the channel number using the 0 to 9 buttons and press SELECT to apply the channel number, or press the up and down arrow buttons to scroll through the available channels and press SELECT to apply the selected channel.

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

Viewing the Channel Status

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

The following table describes the channel information displayed:

Web GUI Field	Front Panel Menu	Description
PE Index	Status > Program PIDs > PE	Indicates the Program Entry number (PE1 to PE16 for single-stream units, or PE1 to PE32 for multi-stream units).
Channel	-	Displays the input channel of the current PE. The channel is displayed in a range from 1 to 65535.
Channel Name	Status > Program PIDs > Stream	Displays the channel name of the current PE.

Web GUI Field	Front Panel Menu	Description
Conditional Access System ID	Status > General > CA System	Indicates the type of Conditional Access (CA) system used by the program (SA, BISS, or FTA).
Channel Authorised	Status > General > CA Auth	Indicates whether the receiver is authorized to receive the program (Yes or No).
Channel Encrypted	Status > General > CA Enc	Indicates whether the received program is encrypted (Yes or No).
Channel Scrambled	Status > General > CA Scr	Indicates whether the received program is scrambled (Yes or No).
SR Status	Status > Program Status > SR Status	Displays the status of an alternate authorized program/service from the same transport stream when the receiver is not authorized to view the primary program. This is an uplink initiated function that maps the alternate service to the original (primary) service PIDs, replacing the original service with the alternate service at the digital transport output. No local intervention is required by the receiver operator for provision of this service replacement feature. The statuses are Not Started, Primary, or Alternate. • Not Started - Indicates that an event has not started. • Primary - Indicates that a service replacement event is active, but the primary program is being displayed. • 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.

Web GUI Field	Front Panel Menu	Description
SR Type	Status > Program Status > SR Event Type	Indicates the type of service replacement event. • None - Indicates that no service replacement event is scheduled. • Scheduled - Indicates that all receivers will tune to the alternate program at the scheduled time. This status applies to PE1 (PowerVu) only. • 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) only. • 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).
SR Start/End Time	Status > Program Status > SR Event Start/SR Event End	Displays the start/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 GUI, choose **Input > PSI Tables**. Or, from the Main Menu of the front panel, choose **Diagnostics > PSI > Tables**.

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

The table below lists the PSI tables information.

Web GUI Field	Front Panel Menu	Description
Table Type	Type	Indicates the MPEG table acronym (PAT, CAT, PMT, TSMT, 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).
Table ID Extension	Tbl-ID	Displays the MPEG/DVB Table ID.
Status	Status	Indicates the reception status of the table (None, Partial, Full, Update, Timeout, or Lost).
Version	Ver	Indicates the table version number.
PID	PID	Indicates the value of the PID on which the table is present.
Number of Sections	Sections	Indicates the number of sections in the table.

Viewing PSI Frequency Table

You cannot make any changes in the PSI frequency table, and can only view the available frequency plans stored in the receiver.

From the D9800 web GUI, choose **Input > Stream Details > PSI Frequency**. Alternatively, from the Main Menu of the D9800 front panel, choose **Diagnostics > PSI > Frequency Plan**.

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

The table below lists the available frequency plans.

Web GUI Field	Front Panel Menu	Description
Transport Stream ID	TxID	Displays the transport ID.
Frequency (GHz)	Freq(GHz)	Displays the downlink frequency, in GHz (0.0 to 15.0 GHz).
Symbol Rate (MSym)	SymRate	Displays the symbol rate, in Mbps.
Orbital Position	OrbPos	Displays the orbital position of the satellite, in degrees (East or West).
Polarization	Pol	Displays the polarity of the received signal (H, V, or Off).

Web GUI Field	Front Panel Menu	Description
Flag	-	Displays the satellite position (in degrees), in combination with the direction (East or West).
FEC	FEC	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).
RF Modulation	Modulation	Indicates the modulation of the signal (QPSK DVB-S, QPSK DVB-S2, 8PSK DVB-S2 or 16QAM DVB-S2).
Network ID	ONID	Displays the original network ID.

Viewing the PSI Channels

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

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

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

The table below lists the PSI channel information.

Web GUI Field	Front Panel Menu	Description
Service ID	VC	Displays the virtual channel number.
TS ID	TxID	Displays the identification number of the transport on which the channel is available. For more information on the transport streams, see Viewing PSI Frequency Table , on page 59.
Program Name	Program Name	Indicates the name of the channel.
PMT PID	PMT	Indicates the PID of the channel's Program Map Table. If unavailable, it is displayed as ----.
EMC PID	EMC	Indicates the PID of the channel's Entitlement Control Message stream. If unavailable, it is displayed as ----.

Viewing the PID Input Status

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

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

Web GUI Field	Front Panel Menu	Description
PE Index	PE	Indicates the Program Entry number (PE1 or PE16).
Input Name	—	The name of the active input assigned to the program entry.
Type	Stream	Name assigned to the Program Entry, up to 4 alphanumeric characters.
Detail	Detail	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 UTLD, SCTE DPL, SA HSD, SA CDDL, SA WBD, SA SUBT, ECM, EMM, PCR, or UNKNOWN.
Language	-	Displays the language code carried in the PMT for the current PID, if applicable.
PID	PID	Displays the program PID number, in the range from 1 to 8192.
Present	Present	Indicates whether the PID is present in the incoming stream (Yes or No).

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. CAMs must be purchased from Cisco. For more information, contact Cisco Services.

-
- Step 1** From the D9800 web GUI, choose **Input > CI Setup**. Or, from the Main Menu of the D9800 front panel, choose **Setup > CI**.
- Step 2** From the **CI CAM QUERY Support** drop-down list, or the **Query** front panel menu, choose Enable to query the CAM prior to decryption to ensure that the card can be decrypted. The default is Disable.
- Step 3** From the **CI CAM Auto Reset** drop-down list, or the **AutoReset** front panel menu, choose Enable to automatically reset the card. The default is Disable.
- Step 4** From the **CA List Management Type** drop-down list, or the **ListMgmt** front panel menu, choose whether the Common Interface List Management should add and delete (AddDel) individual programs or update all (UpdateAll) the programs when the list changes.
- Note** Updating all the programs will cause temporary loss of service for all the programs when another is being modified.
- Step 5** From the **TS/ONID Check** drop-down list, or the **TS_ON_ID** front panel menu, choose Enable if you want to restrict the incoming transport stream to the transport ID and transport original network ID listed below. If the incoming stream does not match the specified transport stream, the CAM will not decrypt. The default is Disable.
- If you set the **TS/ONID Check** to Enable, you must define the **Transport ID** and **Original Network ID** (**TS_ID** and **ON_ID** front panel menus). If the incoming stream does not match the specified IDs here, the CAM will not decrypt. You can enter a value in a range from 0 to 65535.
- Step 6** From the **CAM TS Handling** drop-down list, or the **TS Routing** front panel menu, choose EntireTS to use the CAM to decrypt the entire transport stream, or choose ServicesOnly to use the CAM to decrypt only the PIDs being used by the active services.
- Step 7** Apply the changes.
-

Setting up the Common Interface Program Description

-
- Step 1** From the D9800 web GUI, choose **Input > CI Setup** and refer to the **Common Interface Program Description** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > CI**.
- Step 2** From the **CI Slot** drop-down list or front panel menu, choose the CAM slot to use for decryption. If you choose AUTO for PE 1, the software automatically assigns the slot capable of decrypting the stream. Choose TOP to use the top CAM slot for decryption or choose BOTTOM to use the bottom CAM slot for decryption.
- Note:** If CI Slot is set to AUTO, the Decryption Mode must be set to ON.
- Step 3** The Decryption Mode drop-down list, or the Decrypt front panel menu, determines 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.
- 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:

If you set by	Parameter Settings
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 4

Apply the changes.

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

Viewing the Common Interface (CI) Status

From the D9800 web GUI, choose **Input > CI Status**, or from the Main Menu of the D9800 front panel, choose **Setup > CI > Top/Bottom Slot**.

The table below describes the CI status information displayed.

Web GUI Column	Front Panel Menu	Description
CI Slot	—	Indicates whether it is the top slot (TOP) or the bottom slot (BOTTOM).
CAM Status	Status	Status of the CAM (Ready or Not Ready).
Sys Name	System Name	System name of the CAM.
Comp Name	Company Name	Displays the company name of the CAM.

Web GUI Column	Front Panel Menu	Description
Manufacturer Code	Manufacture Code	Displays the internal code from the manufacturer.
Manufacturer ID	Application Manufacture ID	The factory loaded application number of the CAM.
Serial Number	Serial Number	The unique serial number of the CAM.
Hardware Version	Hardware Version	The hardware version number of the CAM.
Application Version	Application Version	The software version number of the CAM.
—	Product Name	Displays the product name of the CAM.
—	Supported CA System IDs	Displays the CA system identification name of the CAM. Some CAMs may support multiple CA system IDs.

Setting up the BISS Mode

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

-
- Step 1** From the D9800 web GUI, choose **Input > BISS**. Or, from the Main Menu of the D9800 front panel, choose **Setup > CA**.
- Step 2** From the **BISS Mode** drop-down list or front panel menu, choose the Basic Interoperable Scrambling System mode for the receiver (Mode 1 or Mode E). All channels assigned to the PE identified as BISS CA-controlled in the PMT will be decrypted.
- Step 3** If you selected BISS Mode 1, enter a fixed 12-character BISS Mode-1 session word in the **BISS Mode-1 Session Word** field, or the **BISS-1 SW** front panel menu. Once entered it cannot be viewed and it is only displayed as asterisks (*). Contact your program provider for the session word.
- Step 4** If you selected BISS Mode E, enter the 16-character BISS Mode-E session word in the **BISS Mode-E Encrypted Session Word** field, or the **BISS-E ESW** front panel menu, and the 14-character BISS Mode-E injected ID in the **BISS Mode-E Injected ID** field, or the **BISS-E IID** front panel menu. Once entered, neither of these values can be viewed and it is only displayed as asterisks. Contact your program provider for the respective session word and/or injected ID.
- Step 5** Apply the changes.
-

Viewing the Conditional Access Status

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

The table below describes the CA status displayed.

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

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, page 67](#)
- [Configuring the SDI Outputs, page 75](#)
- [Setting up Audio Information, page 77](#)

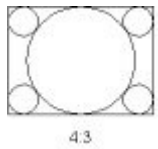
Setting up the Video Information

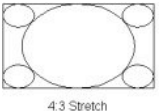
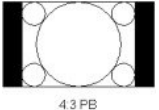
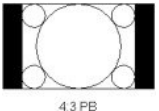
- Step 1** From the D9800 web GUI, choose **Audio & Video > Video Decoding**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > Video**.
- Step 2** From the **Primary Video Output** drop-down list, or the **PV Format** front panel menu, choose the primary video output format for local decoding (HDMI output).
- If you choose Auto, HD720p, HD1080i, or HD1080p, set the **SDI 1** and/or **SDI 2** drop-down lists to SD or HD.
Note If the incoming stream is UHD (with a valid UHD license) or SD, and the **SDI 1** and/or **SDI 2** fields are set to HD, then the SDI ports are muted.
 - If you choose UHD2160p, UHD2160pHDR, or SD, the **SDI 1** and **SDI 2** drop-down lists are automatically set to SD.
- Step 3** 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). For more information on setting the SDI output format, see Step 2.
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**).

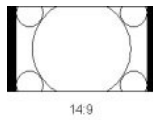
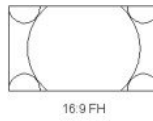
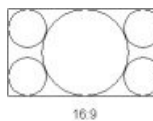
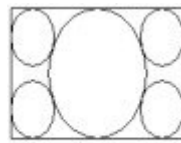
- Step 4** From the **Standard Definition Output** drop-down list, or the **SD Format** front panel menu, choose the actual standard definition output format of the primary video if the PV Output is set to SD. The options are: Auto, NTSC, PAL-N (AR), PAL-M, or PAL-B/G/I/D. You must use NTSC for 525-line systems and PAL-B/G/I/D for 625-line systems.
- Step 5** 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 6** 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 7** 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.
- | Option | Description |
|-------------|---|
| Passthrough | Passes WSS unmodified as received by the receiver. |
| Auto:Create | Creates WSS to output the correct aspect ratio when performing aspect ratio conversion. |
| Auto:Modify | 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. |
| Suppress | Removes WSS output. |
- Step 8** 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 9** Apply the changes.

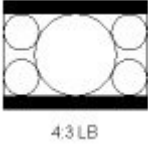
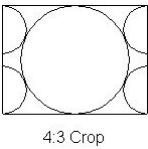
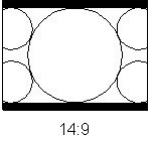
Aspect Ratio Conversion

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 Aspect Ratio field of the web GUI and the Act Conv menu of the front panel.

Stream	Standard Definition Aspect Ratio or TV A/R	Standard Ratio Conversion or Convert	Aspect Ratio or Act Conv	Description	Image
4:3	4:3	None	None	Normal Picture	

Stream	Standard Definition Aspect Ratio or TV A/R	Standard Ratio Conversion or Convert	Aspect Ratio or Act Conv	Description	Image
4:3	4:3	Auto	None	No conversion	-
4:3	4:3	16:9 L/B	None	Conversion is not possible. Normal picture.	-
4:3	4:3	4:3 CCO	None	Conversion is not possible. Normal picture.	-
4:3	4:3	4:3 P/B	None	Conversion is not possible. Normal picture.	-
4:3	4:3	14:9	None	Conversion is not possible. Normal picture.	-
4:3	4:3	16:9 SCALE	None	Conversion is not possible. Normal picture.	-
4:3	16:9	None	None	Picture is short and wide.	
4:3	16:9	Auto	4:3 P/B	Uses 4:3 P/B.	
4:3	16:9	16:9 L/B	None	Conversion is not possible. Picture appears short and wide.	-
4:3	16:9	4:3 CCO	None	Conversion is not possible. Picture appears short and wide.	-
4:3	16:9	4:3 P/B	4:3 P/B	4:3 picture is centered in a pillar-style box.	

Stream	Standard Definition Aspect Ratio or TV A/R	Standard Ratio Conversion or Convert	Aspect Ratio or Act Conv	Description	Image
4:3	16:9	14:9	14:9	Compromises some up-sampling. Some black bars and cropping are visible.	 14:9
4:3	16:9	16:9 SCALE	16:9 SCALE	Vertically up-samples the center of the 4:3 picture and crops the top and bottom of the screen.	 16:9 FH
16:9	16:9	None	None	Normal	 16:9
16:9	16:9	Auto	None	No conversion. Normal picture.	-
16:9	16:9	16:9 L/B	None	Conversion is not possible. Normal picture.	-
16:9	16:9	4:3 CCO	None	Conversion is not possible. Normal picture.	-
16:9	16:9	4:3 P/B	None	Conversion is not possible. Normal picture.	-
16:9	16:9	14:9	None	Conversion is not possible. Normal picture.	-
16:9	16:9	16:9 SCALE	None	Conversion is not possible. Normal picture.	-
16:9	4:3	None	None	Picture appears tall and thin.	 16:9 Compressed

Stream	Standard Definition Aspect Ratio or TV A/R	Standard Ratio Conversion or Convert	Aspect Ratio or Act Conv	Description	Image
16:9	4:3	16:9 L/B	16:9 L/B	Vertically down-samples the picture and applies black bars at the top and bottom of the screen.	 4:3 L/B
16:9	4:3	4:3 CCO	4:3 CCO	Horizontally up-samples the center portion of the picture to fill the screen.	 4:3 Crop
16:9	16:9	4:3 P/B	None	Conversion is not possible. Picture appears tall and thin.	-
16:9	4:3	14:9	14:9	Compromises some up-sampling. Some black bars and some cropping are visible.	 14:9
16:9	4:3	16:9 SCALE	None	Conversion is not possible. Picture appears tall and thin.	-

**Note**

Active Format Descriptor (AFD) - normally it is necessary to set both the TV Aspect Ratio and Conversion to correctly display the video program on the TV system. The Auto AFD option enables the receiver output to automatically match the display format of the video program to the TV system based on specific (uplink) program information carried in the transport stream. In this case, the receiver performs the conversion based on the TV Aspect Ratio setting combined with the program-specific uplink information to provide the “best fit” for display of the program material on the TV. This feature is primarily used in 16:9 and 14:9 (wide screen) applications.

Viewing the Video Status

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

The fields/menus are *read-only*. The following table describes the video status information displayed.

Web GUI Field	Front Panel Menu	Description
Primary Video Output	—	Indicates the actual output video format.
Standard Definition Output	—	Displays the actual standard definition format of the primary video output if the PV Output is set to SD.
Aspect Ratio	Stream AR and Act Conv	Indicates the aspect ratio of the incoming video stream (4:3 or 16:9), including the actual aspect ratio conversion will perform.
Wide Screen Signalling	—	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.
Video Input Format	Video	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, Unknown or Unsupported).
Encoding Format	—	The input stream type of the received signal/program.
Bit Rate (Mbps)	Rate (Mbps)	Indicates the bit rate of the received video stream, in Mbps.
Frame Rate (fps)	FPS	Indicates the frame rate of the input video stream (25.0, 29.97, 30.0, 50.0, 59.94, 60.0, unknown, or unsupported).
3:2 Pulldown	3:2 Pulldown	Indicates whether 3:2 pulldown is detected, was recently detected, or not detected in the input video stream (Yes, Recent, or No).

Setting up the Video VBI and Closed Caption Information

-
- Step 1** From the D9800 web GUI, choose **Audio & Video > Video Metadata**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > Captions or VBI**.
- 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 or DVS 157). The default is Auto.
- Note** SA Custom is not supported when telecine video encoding is enabled.
- Step 3** 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, 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 4** Apply your changes. The **Status** area of the web GUI and the **Actual Output** front panel menu displays the actual closed caption mode in the output.
-

Setting up the Video Subtitles

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

-
- Step 1** From the D9800 web GUI, choose **Audio & Video > Subtitles**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > Subtitles**.
- Step 2** From the **Subtitle Control** drop-down list (or the **Op Mode** front panel menu), choose the subtitle control to use to display the program subtitles. The following table describes each of the available options:

Option	Description
Off	No subtitles are displayed.
On	Displays DVB or Imtext subtitles, if available.
DVB	Displays only DVB titles, if available. Otherwise, no subtitles are displayed.

Option	Description
Imitext	Displays only Imitext subtitles, if available. Otherwise, no subtitles are displayed.

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.

Option	Description
Auto	Uses the uplink subtitling equipment setting.
Shadow	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.
Opaque	Applies a black box to each text character.
Semi	Applies a semi-transparent box to subtitle text.
None	No shadow or outline is applied to subtitle text.

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.

Option	Description
Language List	Choose the MPEG language to display from the available list.
Language Entry	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.
PMT Order	Choose the subtitle PID entry to display (First to Eighth). This information is available from your uplink provider.

Step 7 Apply the changes.

Configuring the SDI Outputs

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

- Step 1** From the D9800 web GUI, choose **Audio & Video > SDI**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > SDI**.
- Step 2** From the **SDI 1** and **SDI 2** drop-down lists, choose the type of output for the SDI ports. You can also set these settings on the Video Setup page. For more information, see [Setting up the Video Information, on page 67](#).
- Step 3** In the **SDI VANC Service Setup & Status** area, check the **Enable** check box next to the listed services or outputs to enable the selected outputs in SDI. Or, choose the **SDI** front panel menu and scroll through the services. The services or outputs are listed in the **Service ID** menu, and you can enable the outputs from the **Enable** menu.

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

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

- Step 4** In the **SDI Audio Group Setup** area or the **Audio Slot** front panel menu, choose the audio source (1 to 4) and audio source channel (Left or Right) for each of the available audio group and HANC position. The **SDI** front panel menu displays the current SDI port number. It is *read-only*.

- Step 5** Apply the changes.

Setting the SDI Digital Out Preference

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

- Step 1** From the D9800 web GUI, choose **Audio & Video > Audio Decoding**, and refer to the **Audio Setup** area. Or, from the Main Menu of the front panel, choose **Setup > Services > SDI > Audio**.
- Step 2** The **Audio Decode** column displays the to balanced audio output you can configure, or the **Aud#** front panel menu, choose the balanced audio output on the rear panel to configure. The **SDI** front panel menu displays the current SDI port number. It is read-only.
- Step 3** From the **Digital Out Preference** drop-down list, or the **Digital 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 be routed to the AES-3id output, compressed.

When Digital 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 be output PCM, even though Dolby Digital (AC-3) and AAC is compressed (and transcoded).

	Digital Out Preference		
Output Input	PCM Samples	Compressed	
		DDP Mode	
		Transcode (Converter)	Passthrough
MPEG LA (MPEG-1 and MPEG-2)	PCM	PCM	PCM
Dolby Digital (AC-3)	PCM	Dolby Digital (AC-3)	Dolby Digital (AC-3)
Dolby Digital Plus (E-AC-3) (Bit rate < 1.5 Mbps)	PCM	Dolby Digital (AC-3)	Dolby Digital Plus (E-AC-3) (no over-clocking, x1)
Dolby Digital Plus (E-AC-3) (Bit rate > 1.5 Mps)	PCM	Dolby Digital (AC-3)	Dolby Digital (AC-3)
MPEG-2 AAC, MPEG-4 (AAC and HE-AAC)	PCM		MPEG-2, MPEG-4 (AAC and HE-AAC)

- Step 4** From the **DD+ Output** drop-down list, or from the **Setup > Services > Audio > DDP** front panel menu, choose the Dolby Digital Plus output mode. 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.

Viewing the SDI Status

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

The table below describes the parameters.

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

Setting up Audio Information

- Step 1** From the D9800 web GUI, choose **Audio & Video > Audio Decoding**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Services > Audio**.
- Step 2** The **Audio Selection** area allows you to select the audio PID for audio decoding. The D9800 supports four local audio devices.
- The **Audio Decode** column displays the to balanced audio output you can configure, or 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).
 - From the **Select By** drop-down list, or the **Select Language By** front panel menu, choose the input source for Audio 1, 2, 3, or 4 (PMT Order, Language List, or Language Entry). This is required if the monitored program contains more than two audio PIDs.
Note The input source for Audio 1 must match the input source for Audio 2, 3, and 4. For example, you cannot choose PMT Order for Audio 1, and then Language List for Audio 2.

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

If **PMT Order** is selected, choose the PMT source for the audio channel from the **PMT Source** column, or the **PMT Scr** front panel menu (None, AUD1 to AUD64). You cannot select the same PID for both audio devices. If you select 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.

Step 3

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

Note Audio 3&4, Digital Out Preference, and DD+ Output options are only available if the unit has the SDI option installed (D9800-3G-SDI). For more information on the Digital Out Preference and DD+, see [Setting the SDI Digital Out Preference, on page 76](#).

- a) From the **Audio Mode** drop-down list, or the **Stereo/Mono** front panel menu, choose the audio mode, which sets the output mixing. Choose Stereo (Left and Right are passed directly through to Left and Right), R-Mono (Right is passed to both the Left and Right), L-MONO (Left is passed to both the Left and Right), or Mixed (Left is passed to both the Left and Right, and Right is passed to both the Left and Right).
- b) From the **AC3 Compression** drop-down list or front panel menu, choose the mode to use if the output is compressed Dolby Digital audio. The selections are Line Mode, Custom 1, Custom 0 or RF Mode. RF Mode is recommended for analog cable modulators.
- 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.

Step 4

Apply the changes.

Viewing the Audio Status

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

The table below describes the audio status information.

Web GUI Field	Front Panel Menu	Description
Audio	AUD	Displays the current audio decoder status. • AUD1 for audio channel Aud1. • AUD2 for audio channel Aud2. • AUD1 to AUD4 for two stereo audio channels.
PID	-	Indicates the program PID number (1 to 8191).
Language	-	Indicates the language code.
Format	Format	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, or DDP).
Bit Rate (kbps)	BR (kbps)	Displays the bit rate of the audio input stream, in kbps.
SFR	SFR	Displays the sample rate of the input audio stream, in kHz (32, 44.1, or 48 KHz).
Buffer	Buffer	Indicates the buffer level of the input audio stream, in bytes.
DDP Mode	DDP IND	Displays the presence of Dolby Digital Plus frames within a Dolby Digital audio stream (ON or OFF).
Dualmono Mode	DUAL-MONO IND	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 Audio PIDs

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

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

Audio PIDs	Description
Type	Displays the input audio source (AUD1 or AUD2).

Audio PIDs	Description
Detail	Indicates any detail associated with the audio PID.
Language	Displays the language code of the audio PID, if applicable.
PID	Indicates the audio PID number, in the range from 1 to 8192.
Present	Indicates whether the audio PID is present in the incoming stream (Yes or No).



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, page 81](#)
- [Testing Cue Tones, page 82](#)
- [Setting up the Cue Tone Sequences, page 83](#)
- [Setting up Services to be Decoded by the Receiver, page 83](#)

Setting up Cueing Parameters

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

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

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

- a) In the **Cueing Tone Repeat Count** field, or the **Repeat** front panel menu, set the number of consecutive tone sequences to be generated. Values greater than 1 are provided when a scenario demands repetition to ensure that the ad insertion equipment receives the signal. You can enter 1, 2, or 3. The default is 3.
- b) In the **Tone Duration** field, or the **Tone (ms)** front panel menu, choose the duration of each tone, in milliseconds, in the range from 0 to 80. The default is 40.
- c) In the **Silence Duration** field, or the **Silence (ms)** front panel menu, enter the duration of each silence between tones, in milliseconds. The duration is in the range from 0 to 80. The default is 40.

Trigger refers to open-collector pins which can be generated at the Cue Tone/Relay output on the rear panel of the receiver. If the Cueing Mode is set to Trigger, configure the following:

- a) From the **Trigger Polarity** drop-down list or front panel menu, choose the pin polarity. Choose High for the pins to act as open or floating collectors on an active cueing signal and as ground on an inactive signal. Choose Low for the pins to act as ground on an active cueing signal and as open or floating collectors on an inactive signal.
- b) From the **Relay Trigger Bit** drop-down list, or the **Cue Trigger Bit** front panel menu, choose the cue trigger bit/pin that will activate the relay.

Step 3

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

Relay Mode	Condition	Relay Contact	
		NC-C	C-NO
Alarm	Unit Power Off	Open	Close
	Alarm State	Open	Close
	No Alarm	Close	Open
Trigger	Active (selected in PNC)	Close	Open
	Inactive	Open	Close

Step 4

Apply the changes.

Testing Cue Tones

Step 1

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

Step 2

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

Step 3

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

Option	Description
*	Start tone only.
#	End tone only.

Option	Description
*/#	Start and end tones. The end tone is signaled after waiting the time specified in Delay(sec).

Step 4 Apply the changes or choose **Run Test** from the front panel menu.

Setting up the Cue Tone Sequences

- Step 1** From the D9800 web GUI, 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 GUI lists the tone sequences you can configure, or choose the **Seq#** front panel menu and then choose the tone sequence to configure (1 to 16).
- 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 82.
- 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

- Step 1** From the D9800 web GUI, 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.



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, page 85](#)
- [Configuring the ASI or MPEGoIP Output General Settings, page 87](#)
- [Configuring the ASI or MPEGoIP Output Mode, page 88](#)
- [Setting Up Redundancy Controls for MPEG over IP Output, page 91](#)
- [Synchronizing the Output Services, page 91](#)
- [Resolving Conflicts, page 95](#)
- [Setting up the DPM Program Entries, page 95](#)
- [Copying between ASI and MPEGoIP DPM Settings, page 99](#)
- [Configuring the Program Entries, page 100](#)
- [Setting the SAP IP Address, page 103](#)
- [Setting the Transport Packet Limits, page 103](#)
- [Configuring the Forward Error Correction Settings, page 104](#)
- [Configuring MPEG over IP or IP Data Streams, page 107](#)
- [Configuring the Transcoder Settings, page 108](#)

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.

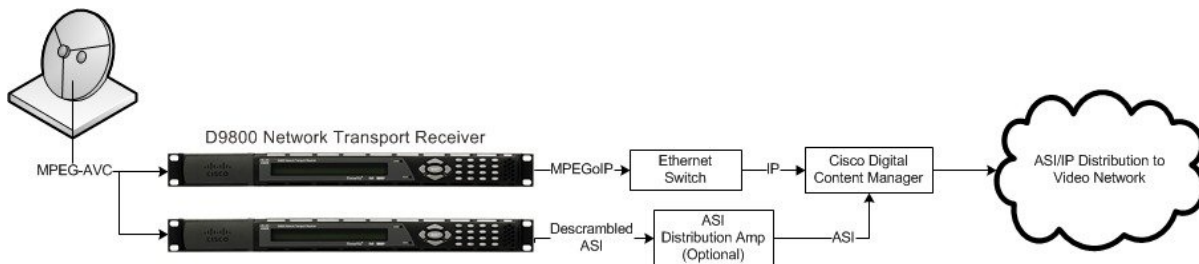
DVB-ASI Output

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.



SDI Outputs

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

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



Configuring the ASI or MPEGoIP Output General Settings

Step 1

Do one of the following:

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

Step 2

From the **Rate Control** drop-down list or front panel menu, choose the method used to calculate the output rate. The table below describes the effect each of the settings has on the output bit rate.

Option	Description
Auto	The output rate follows that set by the uplink. If the Null Packet Insertion, or the Insert Null Packet front panel menu, is set to Yes, the output rate is the same as the input rate (including all null packets). If the Null Packet Insertion, or the Insert Null Packet front panel menu, is set to No, the output rate is equal to the payload rate of the transport stream to be encapsulated, and in most cases, it will be lower than the overall input rate.
User	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. 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 3

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 4

From the **Null Packet Insertion** drop-down list, or the **Insert Null Packet** front panel menu, choose Yes (recommended) to insert null packets into the output to maintain output at a constant bit rate. Null packets are always inserted if the Rate Control is set to User and the configured output bit rate is higher than the payload rate of the transport stream to be encapsulated.

Step 5

Apply your changes.

Configuring the ASI or MPEGoIP Output Mode

Step 1

Do one of the following:

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

Option	Description
No Output	No ASI, MPEGoIP, or IP output will be generated and the ASI or DATA ports will be disabled.
Passthrough	All PEs will be set to Pass and other DPM settings will also be set.
Service Channels Only	This is similar to Passthrough, except that only channels applied to program entries are available on the output.
MAP Passthrough	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.

Option	Description
MAP Service Channels Only	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. Note 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.
Transcoding (multi-stream units only)	The output will be generated using the DPM MAP settings, except that the DPM Action will be set to XCode and the Descrambled mode will be set to Descrambled. If the input is tuned to a valid channel, the PEs are automatically set to XCode. Otherwise, the PEs are automatically set to Drop. Note If the PE is transcoded, it uses the last valid input. The output map (for example, output channel PMT) does not change automatically if the input or channel number is changed.
SPTS Service Channels Only (MPEG over IP only)	The service channel is passed with the same channel number, PMT PIDs, and ES PIDs.
SPTS MAP Service Channels Only (MPEG over IP only)	The service channel is mapped to the preconfigured channel number, PMT PIDs, and ES PIDs.
SPTS Transcoding (multi-stream units only)	The service channel is mapped to the preconfigured channel number, PMT PIDs, and ES PIDs. The PEs are automatically set to XCode.

You are prompted to Resync All for the selected output. This resynchronizes the inputs to outputs for the current PMT according to the service assignments and the PIDs for the PE.

The **Mode Status** field, or the **Config Type** front panel menu, indicates the current DPM configuration change by a user after changing the Output Mode. The following table lists the statuses:

Mode Status or Config Type	Description
Unmodified	No changes were made after setting a new output mode. In a multi-stream unit, this applies to single input mode only. For more information on single input mode, see Assigning a Channel to a Program Entry, on page 55. In a multi input mode, Unmodified (MS Mode) status is displayed.

Mode Status or Config Type	Description
Edited by User	DPM changes were made by the user after setting the Output Mode. In a multi-stream unit, this applies to a single input mode only. For more information on the single input mode, see Assigning a Channel to a Program Entry, on page 55. In a multi input mode, Edited by User (MS Mode) status is displayed.
Auto Re-Mapped	The output map changed automatically to fix the output channel or PID conflicts at the time of setup. In a multi-stream unit, this applies to a single input mode only. For more information on the single input mode, see Assigning a Channel to a Program Entry, on page 55. In a multi input mode, Auto re-mapped (MS Mode) status is displayed.
Chg by Uplink	DPM output changes were made, based on the uplink request after setting the Output Mode. In a multi-stream unit, this applies to a single input mode only. For more information on the single input mode, see Assigning a Channel to a Program Entry, on page 55. In a multi input mode, Chg by Unplink (MS Mode) status is displayed.
Auto-Adjusted	This is for multi-stream units only. It indicates that the Auto-Adjusted (MS Mode) status has not changed, but input mode has changed from a multi input mode to a single input mode. For more information on single input and multi input modes, see Assigning a Channel to a Program Entry, on page 55.
Auto-Adjusted (MS Mode)	This is for multi-stream units only. DPM changes were made automatically when switching from single input mode to multi input mode. For more information on the DPM changes, see Assigning a Channel to a Program Entry, on page 55.

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.

Setting Up Redundancy Controls for MPEG over IP Output

The **Redundancy Control** area allows you to configure redundancy for MPEG over IP or IP Data output 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** From the D9800 web GUI, choose **Transport Stream > MPEG over IP Output** or **IP** and refer to the **Redundancy Control** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > IP > Redundancy**.
- Step 2** From the **Mode** drop-down list or front panel menu, choose one of the following:
- **Manual: Data1** or **Manual: Data2** - Only use DATA 1 or DATA 2 port for output data. The remaining redundancy controls below are not applicable. If you are configuring redundancy for IP Data 3/Data 4 Output on a multi-stream unit, DATA 1 is the DATA 3 port, and DATA 2 is the DATA 4 port.
 - **Backup: Primary Data1** or **Backup: Primary Data2** - Use DATA 1 or DATA 2 port as the primary data port and if a physical connectivity loss occurs, it will failover to the backup port. The backup port is the port that is not used as a primary port in a port pair. For example, if Data 1 is the primary port, the backup port is Data 2. If you are configuring redundancy for IP Data 3/Data 4 Output on a multi-stream unit, DATA 1 is the DATA 3 port, and DATA 2 is the DATA 4 port.
- In the **Direction** drop-down list or front panel menu, choose the redundancy direction:
- **Revertive** - Attempt to revert back to the primary port when using the backup port and the primary port is active again
 - **Non-Revertive** - Always use the backup port, regardless of the condition of the primary port.
 - **Mirroring** - Send the same data to both DATA 1 and DATA 2 ports, or DATA 3 and DATA 4 ports. The remaining redundancy controls below are not applicable.
- Step 3** In the **Delay Forward** field, set the time to switch the data port after the system detects a failure, in a range from 0 to 10000 milliseconds.
- Step 4** In the **Delay Back** field, set the time to wait when reverting back to the primary port once the primary link is active again, in a range from 1 to 120 seconds.
- Note** If Non-Revertive is selected as the **Direction**, this field does not apply.
- Step 5** Apply the changes.
- You can view the latest redundancy status changes in the **Redundancy Status** area. The **Ports In Use** column displays the current output port in use, the **Change Reason** column displays a description of the reason for the last redundancy status change (Link or Setup+Link), and the **Change Date & Time** column displays the last date and time the redundancy status changed.
-

Synchronizing the Output Services

There are two methods for resynchronizing the program entry output with its input: resynchronize or resynchronize all. The resynchronize option allows you to customize the synchronization. The resynchronize

all option synchronizes all the DPM output with the PMT data for all the program entries on the selected output.

Step 1

Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI or MPEG over IP.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 output.
- Front Panel: From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > DPM**.

Step 2

In the DPM Program Entry Setup table, 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.

Web GUI option	Front Panel option	Descriptikon
Resynchronize Program, PMT PID, ES List & ES PIDs	All	The receiver synchronizes the PE output according to the services and then the PIDs assigned to each service.
Resynchronize ES List	Svcs	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.
Resynchronize ES PIDs	PIDs	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.
Resynchronize Template ES List & PIDs	Template	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.

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 95](#).

Setting up the Auto Synchronization Options

The **ASI**, **MoIP**, **IP Data 1/Data 2 Auto Sync** area or the **Auto Map** front panel menu allows you to configure the DPM without editing each output channel and PID separately.

Step 1

Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > ASI Output** or **MPEG over IP Output** and refer to the **Auto Sync** area.
- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > ASI** or **MOIP**.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > ASI 1 Output**, **ASI 2 Output**, **IP Data 1/Data 2 Output**, or **IP Data 3/Data 4 Output** and refer to the **Auto Sync** area.
- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > ASI1**, **ASI2**, **IP1/2**, or **IP 3/4**.

Step 2

From the **Enable Auto Fix for Collision** drop-down list, or the **Auto Map** front panel menu, choose Yes for the DPM to resolve channel and PID collisions automatically on the transport outputs. New values are assigned to the parameters that caused the conflict. The new assigned values are not used by any incoming transport or other PE outputs. If a collision is detected, you can review the new changes and click **Apply** to accept the new changes.

Choose **No** and a detailed list of all the conflicts is displayed in the Output Channel and PID Conflicts table (click View Conflicts) when a conflict occurs. You can then resolve the conflicts manually. For information on resolving conflicts, see [Resolving Conflicts, on page 95](#).

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. If the **Enable Fixed Table Output** is set to Yes, the output configuration for the auxiliary PEs is determined by the fixed output table options when you resynchronize the output channels and PIDs to match the input programs. The DPM resolves any output conflicts automatically, even if the **Enable Auto Fix for Collision** is set to No.

This setting is for multi-stream units only.

Step 4

Apply your changes.

Setting up the Resynchronize All Option

Step 1

Do one of the following:

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

Step 2

From the **Enable Fixed Output** drop-down list, or the **Fixed Output** front panel menu, choose Yes for the DPM to assign new values for all the output channels and PIDs according to the fixed output options defined, when you synchronize the inputs to the outputs according to the service assignments only (Resynchronize All).

Step 3

Click **Fixed Output Option**, or scroll the front panel menus to configure the fixed output options and click **OK**.

- 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.
- 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.
- 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 98.

Configuring DPM General Settings

- Step 1** Do one of the following:
- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI or MPEG over IP output, and refer to the **DPM General Settings** area.
 - Front Panel (single-stream unit): From the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI** or **MOIP**.
 - Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output, and refer to the **DPM General Settings** area.
 - Front Panel (multi-stream unit): from the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI1**, **ASI2**, **IP1/2**, or **IP3/4**.
- Step 2** From the **Remapping Mode** drop-down list, or the **Map Mode** front panel menu, choose the DPM mapping mode for this output.
- Svc ID - The elementary PIDs are not changed. Channels are remapped by changing their PSI references. When this mode is selected, PE detailed PID mapping in the PD menu are ignored.
 - Svc ID & PID - Channels and the elementary service PIDs can be mapped in the DPM PE PID MAP window. If you use this mode, you must choose how to handle duplicate programs from the **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.
- Step 4** From the **Service ID Output** drop-down list, or the **Service ID** front panel menu, choose whether the transcoder should always generate PSI tables for the Mapped PE even if the selected input channel is not available, or for only valid service channels/IDs. The following describes each service ID:
- Valid Ch - Only transmits the PSI tables for the mapped program if the program exists on the input stream.

- All Ch - Transmits the PSI tables for the mapped program even if the program does not exist in the input stream. All Ch is only valid if the PAT, NIT, SDT and PMT are set to Regenerate.

Step 5 Apply the changes.

Setting the PSI Table Options

Step 1 Do one of the following:

- Web GUI (single-stream only): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI, MPEG over IP output, and refer to the **DPM General Settings** area.
- Front Panel (single-stream only): From the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI** or **MOIP**.
- Web GUI (multi-stream only): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output, and refer to the **DPM General Settings** area.
- Front Panel (multi-stream only): From the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > 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 87.

Step 3 From the ASI, MPEG over IP, or IP Digital Program Mapping page:

- Click **Resynchronize All** or choose the **Resync All** from the Global front panel menu.
- Edit a program entry in the **DPM Program Entry Setup** area and add a new record.

For more information, see [Synchronizing the Output Services](#), on page 91 and [Mapping the Program PIDs](#), on page 101.

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 96.

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 97.

Step 6 Apply the changes.

Copying between ASI and MPEGoIP DPM Settings

Step 1 Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI or MPEG over IP output.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output.
- Front Panel: 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:

- Click **Copy to MOIP** on ASI 1 Digital Program Mapping page, or choose the **Copy: > ASI->MOIP** front panel menu, to copy all the DPM data from the ASI 1 output to the IP Data 1/Data 2 output.
 - Click **Copy to MOIP** on ASI 2 Digital Program Mapping page, or choose the **Copy: > ASI->MOIP** front panel menu, to copy all the DPM data from the ASI 2 output to the IP Data 3/Data 4 output.
 - Click **Copy to ASI** on IP Data 1/Data 2 Digital Mapping page, or choose the **MOIP->ASI** front panel menu, to copy all the DPM data from the IP Data 1/Data 2 output to the ASI 1 output.
 - Click **Copy to ASI** on IP Data 3/Data 4 Digital Mapping page, or choose the **MOIP->ASI** front panel menu, to copy all the DPM data from the IP Data 3/Data 4 output to the ASI 2 output.
-

Configuring the Program Entries

Step 1 Do one of the following:

- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI or MPEGoIP.
- Front Panel (single-stream unit): From the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI** or **MOIP**.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output.
- Front Panel (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 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 101](#). 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 4 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 93](#).
- Step 2** From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1, ASI 2, IP Data 1/Data 2, or IP Data 3/Data 4. Or, from the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI1, ASI2, IP1/2, or IP3/4**.
- Step 3** Click a PxA to edit or choose a PxA from the PE front panel menu.
- Step 4** Choose Map from the **Action** drop-down list, or the **Act** front panel menu. For more information on the Action parameter, see [Configuring the Program Entries, on page 100](#).
- Step 5** Save your changes.
- Step 6** Click **Resynchronize All** or choose **Resync: All** front panel menu to ensure that the inputs and outputs are the same.
-

Mapping the Program PIDs

The PID mapping feature allows you to map input services to output PIDs. If the PE Action is Pass, or the PE Action is Map and the Remapping Mode is set to Svc ID, only entries which drop a service are applied and all other services are passed through. If the PE action is Map and Map Mode is Svc ID & PID, all entries are applied. Any services not mapped by an entry will be dropped.

For the front panel, press up and down to scroll through the PID map entries. Press ADV to insert or delete entries from the PID map. After inserting an entry, specify the service using OutType and In, and set the desired Action. If the action is Map, select the output PID value as well. Then press APPLY and save the settings to see the selected input service that will follow that mapping.

-
- Step 1** Do one of the following:
- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI or MPEG over IP output.
 - Front Panel (single-stream unit): From the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI or MOIP**.

- Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > Digital Program Mapping** for ASI 1 Output, ASI 2 Output, IP Data 1/Data 2 Output, or IP Data 3/Data 4 Output.
- Front Panel (single-stream unit): from the D9800 front panel, choose **Setup > Outputs > TS Out > DPM > ASI1, ASI2, IP1/2, or IP3/4**.

- Step 2** Click the program entry radio button you want to map the PIDs and click **Edit** or choose the program entry from the **PE** front panel menu.
- Step 3** In the **Output Channel #** field, or the **OutCh** front panel menu, enter the output channel number you want to map to the input channel (displayed in the **Input Channel #** field or the **InCh** front panel menu). This value is only used if the PE Action is set to Map. You can enter a range from 1 to 65535.
- Step 4** In the **Output PMT PID** field, or the second **PMT** front panel menu, enter the output PMT PID number you want to map to the input PMT PID (displayed in the **Input PMT PID** field or the first **PMT** front panel menu). This value is only used if the PE Action is set to Map. You can enter a range from 2 to 8190.
- Step 5** For front panel only, choose the **PID** menu to map the program PIDs.
- Step 6** You can click on the radio button of an existing PID mapping entry you want to modify or click the + button to insert a new PID mapping. If there is no record available on the front panel, choose Yes to insert a new record. The **Input Stream**, or the **ITyp** front panel menu, indicates the input service that will be mapped by the current entry. The **Input PID**, or the **PID** front panel menu, displays the input PID (1 to 8190) that will be mapped by the current entry. This is only used if **Action** is set to **Map**.
- Step 7** From the **Action** drop-down list, or the **Act** front panel menu, choose the action to perform on the current PID. The Drop action is always performed, but the Map option is only applied if the PE Action is Map and the Remapping Mode is Svc ID & PID in the **DPM General Settings** section.

Option	Description
Drop	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 & PID.
Map	The service selected by the Category and Instance will be removed from the PMT and the output stream.

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

Step 2

In the **SAP Multicast IP Address** field, or the **SAP Address** front panel menu, set the Session Announcement Protocol (SAP) destination IP address. This is the IP address where the SAP announcements are sent, if required.

Note We recommend that you do not change the default IP address (224.2.127.254).

Step 3

In the **SAP Destination UDP Port** field or **SAP Port** front panel menu, set the SAP destination port number (1 to 65534). This is the UDP port where the SAP announcements are sent, if required.

Note We recommend that you do not change the default SAP port of 9875.

Step 4

Apply the changes.

The front panel has the following additional settings:

- Send SAP - Select whether to send Session Announcement Protocol messages (None or RFC2327).
- SAP ID - Choose the SAP output stream name source (User String or SDT Channel).
- SAP User Str - Enter the SAP user string, up to 31 characters.

Setting the Transport Packet Limits

Step 1

Do one of the following:

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

- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > IP > Streams Configuration**.

Step 2 In the **Maximum Transport Packets/Ethernet Frame** field, or the **TS/IP** front panel menu, enter or choose the maximum number of transport packets per IP packet (1 to 7).

Step 3 In the **Minimum number Packets/Second** field, or the **Min IP/s** front panel menu, enter or choose the minimum number of transport packets per IP packet (0 or 2 to 1000).

Configuring the Forward Error Correction Settings

Due to the nature of an IP network (occasionally packet loss, packet reordering, and/or stream jitter) it is not the perfect channel for transmitting broadcast-quality compressed video content. Forward Error Correction (FEC) developed by the Pro-MPEG forum is a unique technology to enhance the robustness of video traffic over IP networks. The D9800 receiver supports Pro-MPEG FEC Code of Practice (COP) #3 release2 and SMPTE-2022, which is based on the exclusive or (XOR) boolean operator applied to a number of data packets. When a FEC packet is created by performing the XOR boolean operation on a number of RTP packets, a missing RTP packet can always be reconstructed by performing the XOR operation on the FEC packet and the remaining RTP packets.

- $FEC = RTP1 \text{ XOR } RTP2$
- $RTP1 = FEC \text{ XOR } RTP2$
- $RTP2 = FEC \text{ XOR } RTP1$

Step 1 Do one of the following:

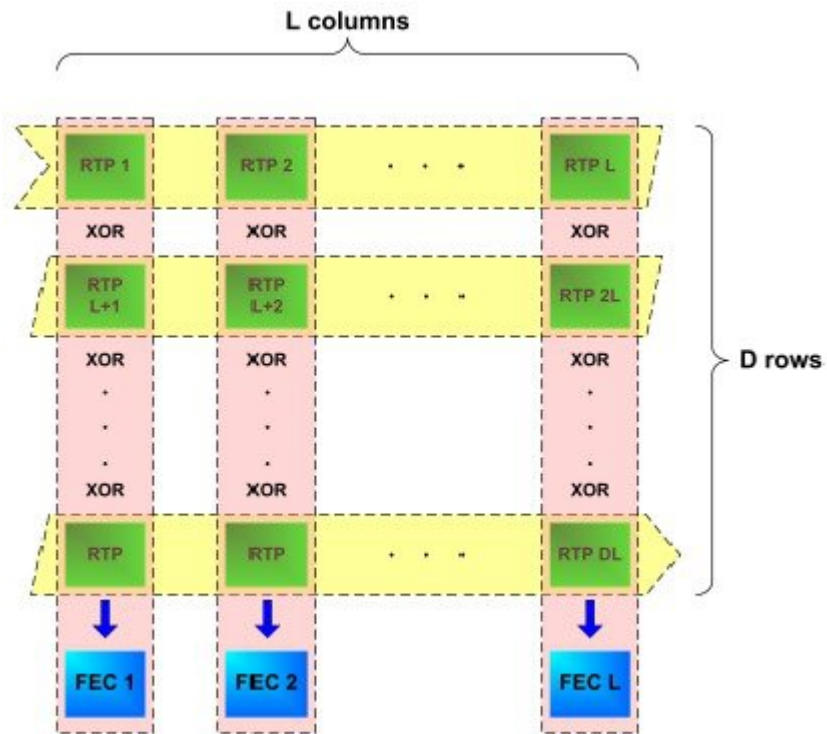
- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > MPEG over IP Output > Stream** tab.
- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > MOIP > MOIP Streams**.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > IP Data 1/Data 2 or IP Data 3/Data 4 Output > Stream** tab.
- Front Panel (multi-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > IP > Streams Configuration**.

Step 2 Click the radio button of the stream you want to configure FEC settings, or choose the **ID** front panel menu and choose the stream.

Step 3 Click **FEC**.

Step 4 From the **FEC Mode** drop-down list, or the **FEC** front panel menu, choose an error protection profile.

- Choose **1D** to use the 1D FEC profile. The 1D FEC profile maps the RTP packet stream across columns (matrix of data packets). The following is an example:



- Choose **2D** to use the 2D FEC profile. The 2D FEC profile maps the RTP packet stream across both the column packets and row packets. In the following example, a FEC packet is created for each row and each column:



- Choose **None** to disable the error protection for the MPEGoIP stream.

Step 5

The generation of the FEC packets is based on the use of a matrix. The matrix size is defined by the Length (L) and Depth (D) parameters. In the **FEC Columns (L)** field or front panel menu, set the spacing between non-consecutive packets used to calculate the FEC packet (1 to 20).

If the FEC Mode or the FEC front panel menu is set to 2D, set the depth of the matrix in the FEC Rows (D) field or front panel menu (4 to 20).

If the **FEC Mode** or the **FEC** front panel menu is set to 2D, set the depth of the matrix in the **FEC Rows (D)** field or front panel menu (4 to 20).

For additional restrictions on L and D values (depending on the FEC Scheme and FEC Mode), refer to Pro-MPEG FEC COP#3 and SMPTE-2022.

Step 6

In the **FEC Columns UDP Port** field, or the **FEC1 UDP** front panel menu, enter the UDP port number for the FEC Columns stream (2 to 65534, even number only). We recommend that you set the port number to TS UDP port + 2.

If the FEC Mode or the FEC front panel menu is set to 2D, enter the destination UDP port number for the FEC Rows stream in the FEC Rows UDP Port field (or the FEC2 UDP front panel menu). The range is from 2 to 65534, even number only. We recommend that you set the port number to TS UDP port + 4.

Step 7

Click **OK** and apply the changes.

Configuring MPEG over IP or IP Data Streams

-
- Step 1** Do one of the following:
- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > MPEG over IP Output > Stream** tab.
 - Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > MOIP > MOIP Streams**.
 - Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > IP Data 1/Data 2 or IP Data 3/Data 4 Output > Stream** tab.
 - 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 (1 to 65534).
Note If Encapsulation is set to RTP, you must choose an even destination port number.
- Step 7** Apply the changes.
-

Configuring Advanced MPEG over IP or IP Data Stream Settings

-
- Step 1** Do one of the following:
- Web GUI (single-stream unit): From the D9800 web GUI, choose **Transport Stream > MPEG over IP Output > Stream** tab.

- Front Panel (single-stream unit): From the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > MOIP > MOIP Streams**.
- Web GUI (multi-stream unit): From the D9800 web GUI, choose **Transport Stream > IP Data 1/Data 2 Output** or **IP Data 3/Data 4 Output > Stream** tab.
- 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.

- Step 1** From the D9800 web GUI, choose **Transport Stream > Transcoder Setup**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > Transcode > Transcode**.
- Step 2** From the **Action on Loss of Input** drop-down list, or the **LO1 Action** front panel menu, choose the action the transcoder takes when there is a loss of input signal (No Output or Black Output).
- Step 3** From **Transcoder 1 Output** to **Transcoder 16 Output** drop-down lists, choose the video format of the transcoded output. The number of transcoder outputs depends on the transcoding licenses available. Or, from the **PE** front panel menu, choose the transcoder index, as referenced by the DPM, and then choose the video format of the transcoded output from the **Video Mode** front panel menu. The table below describes the options.

Option	Description
Auto	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.
SD Output	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 110 .
HD Output	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 110 .

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 88](#).

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 55](#).

Configuring the HD and SD Transcode Settings

- Step 1** From the D9800 web GUI, choose **Transport Stream > Transcoder Setup**. Or, from the Main Menu of the D9800 front panel, choose **Setup > Outputs > TS Out > Transcode**.
- Step 2** Click the **Transcoder 1, 2, 3, 4, 5, 6, 7, or 8 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.
- Step 3** On the web GUI, if the selected channel is set to HD Output, set the following in the **HD Settings** column. If the selected channel is set to SD Output, set the following in the **SD Settings** column.

- a) From the **HRes** drop-down list, or the **HD HRes** or **SD HRes** front panel menu, choose the transcode channel HD or SD horizontal output video resolution. The table below displays the HD settings and resolutions.

HD HRes Setting	Input Resolution	Output Resolution
Full	1080i	1920
	720p	1280
3/4	1080i	1440
	720p	960

- 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 or AVC 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 transcode output channel. The options are 4:3 and 16:9 (wide aspect ratio).
- b) From the **Aspect Ratio Conversion** drop-down list, or the **SD AR Conv** front panel menu, choose the SD transcode channel aspect ratio conversion. This is the conversion that the transcoder will perform on the output signal for the

picture to be displayed correctly (for example, to correspond to the aspect ratio of your TV) on your TV, based on your selection.

- c) From the **Closed Caption Packet 1** and **Closed Caption Packet 2** drop-down lists, or the **CC Pkt 1** and **CC Pkt 2** front panel menus, choose the order to output the closed caption packets on the transcoded SD output.

Step 5 Click **OK**.

Inserting Subtitles to Transcoded Video

Step 1 From the D9800 web GUI, choose **Transport Stream > Transcoder Setup**.

Step 2 Click the radio button of the channel you want to insert subtitles to transcoded video (Transcoder 1, 2, 3, 4, 5, 6, 7, or 8 Output), and click **Subtitle Burn-In**.

Step 3 From the **Subtitle Control** drop-down list, choose the control to use to display the program subtitles. The table below describes the available options.

Option	Description
Off	No subtitles are displayed.
On	Displays DVB or Imtext subtitles, if available.
DVB	Displays only DVB subtitles, if available. Otherwise, no subtitles are displayed.
Imtext	Displays only Imtext subtitles, if available. Otherwise, no subtitles are displayed.

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 **Imtext 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 Imtext.

Step 6 From the **Imtext Foreground Color** drop-down list, choose the color for Imtext 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 Imtext.

Step 7 From the **Imtext Background Color** drop-down list, choose one of the following text background for Imtext subtitles:

Option	Description
Auto	Uses the uplink subtitling equipment setting.
Shadow	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.
Opaque	Applies a black box to each text character.
Semi	Applies a semi-transparent box to subtitle text.
None	No shadow or outline is applied to subtitle text.

This setting is only applicable if the **Subtitle Control** is set to On or Imitext.

Step 8 Click **OK**.

Applying Inband Settings

You can apply uplink parameters for transcoding (such as, bit rate, GOP, and resolution) to the local transcoder settings for the selected program entry. This is only supported with an uplink that uses uplink transcoding controls for the user address of the selected program entry.

- Step 1** From the D9800 web GUI, choose **Transport Stream > Transcoder Setup**, and click **Apply Inband Settings**. Or, from the main menu of the D9800 front panel, choose **Setup > Outputs > TS Out > Transcode > Inband**.
- Step 2** Check the transcoder/program entry check box that you want to apply uplink parameters, or choose the program entry from the **PE** front panel menu and then choose Yes or No from the **Apply Inband** front panel menu. The disabled check box on the web GUI indicates that you do not have sufficient transcoder licenses.
- Step 3** Click **OK**.



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, page 113](#)
- [Setting up the Unicast Routing Information, page 115](#)
- [Setting up SNMP Information, page 116](#)

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 GUI, 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.

Mask	Subnet Mask
8	255.0.0.0
16	255.255.0.0

Mask	Subnet Mask
24	255.255.255.0

- 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

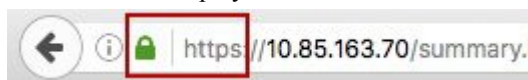
The Link Status table on the IP Settings page (**System Settings > IP Settings**), and the Link Status menu on the front panel (**Status > IP > Link**) display the port information, such as the status, speed, duplex, and crossover. The **Port ID** column displays the name of the ports on the rear panel. The Data3 and Data4 ports are only applicable on multi-stream units.

Configuring the Remote Access Protocols

The **Protocol Control** area, or **Protocols** front panel menu, allows you to control remote access protocols to the D9800 unit (HTTP, HTTPS via HTTP secure setting, IGMP, and SNMP).

- Step 1** From the D9800 web GUI, choose **System Settings > IP Settings** and refer to the **Protocol Control** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > IP > Protocols**.
- Step 2** From the **HTTP** drop-down list or front panel menu, choose **HTTP** to allow HTTP connection. The associated TCP port number is 80.
Choose **HTTPS** (default) to enable an encrypted access to the webserver. The associated TCP port number is 443. When you click **Apply**, a confirmation message is displayed that you will be logged out automatically. It will reconfigure the device and the next time a user logs in, the user will access the encrypted version (HTTPS). An untrusted connection warning message is displayed (first time only). Add the current address as an exception and the user can access the D9800 web GUI.

Note The HTTPS is displayed in the IP address to denote that it is a secure access.



Choose Disable to disable HTTP connections. If HTTP and SNMP options are disabled, you can only access the D9800 via the front panel.

- Step 3** From the **SNMP** drop-down list or front panel menu, choose **Enable** to allow SNMP connections. The associated UDP port number is 161. Choose **Disable** to disable SNMP connections. If HTTP and SNMP options are disabled, you can only access the D9800 via the front panel.
- Step 4** From the **IGMP** drop-down list or front panel menu, choose the Internet Group Management Protocol (IGMP) standard. This is used by the host, for multicast input, to send join or leave requests to the IGMP server, and to establish multicast group memberships.
- Note** If configured, the source filtering in MPEGoIP Flow Configuration applies to IGMPv3. For more information, see [Configuring the MPEG over IP Input](#), on page 46.
- Step 5** In the **Idle Timeout (seconds)** field, enter the number of seconds before the session for all the enabled protocols will timeout due to inactivity, in a range from 30 to 1209600 seconds. Enter zero to never timeout.
- Step 6** Apply the changes.
-

Configuring the System Logs

- Step 1** From the D9800 web GUI, choose **System Settings > IP Settings** and refer to the **Protocol Control** area. Or, from the Main Menu of the D9800 front panel, choose **Setup > IP > Protocols**.
- Step 2** From the **Syslog** drop-down list or front panel menu, choose the logging protocol to use (Syslog TCP or Syslog UDP), or choose **Disable** to disable the system logging. The default port number is 514 for TCP and UDP.
- Step 3** In the **Syslog Server IP Address** field or the **Syslog Server** front panel menu, enter the IP address of the server, and the UDP or TCP port number of the server in the **Syslog Server Port** field or the **Port** front panel menu. We highly recommend that you use the following syslog servers:
- Syslog-ng - Balabit for Linux (<http://www.balabit.com/networksecurity/syslog-ng/opensource-logging-system>)
 - Syslog Watcher - SnmpSoft for Windows (<http://www.snmpsoft.com/downloads.html>)
- Step 4** Apply the changes.
-

Setting up the Unicast Routing Information

- Step 1** From the D9800 web GUI, choose **System Settings > IP Unicast Routing**.
- Step 2** In the **Static Unicast Routing** table, do the following to set the static unicast routing information used by the MPEGoIP. It can also be used to find hosts behind a router (for example, a syslog server or an NTP server).
- a) Click the + sign to add a row.
 - b) In the **Destination IP Address** field, enter the destination IP address for the unicast route.
 - c) In the **Mask** field, enter the number of Classless Inter-Domain Routing (CIDR) bits (8 to 30).

- d) In the **Gateway Address** field, enter the gateway address on the network used to expose the receiver to a WAN. The table below shows the most commonly used subnet mask values to enter for a chosen IP address mask, depending on the size of your network.

Mask	Subnet Mask
8	255.0.0.0
16	255.255.0.0
24	255.255.255.0

- e) To specify the port to use for the unicast route, check the **Port 1** and/or **Port 2** check box. Port 1 is the DATA1 port, and port 2 is the DATA2 port.

Step 3 Click **Save**.

The routing information is displayed in the Installed Unicast Routes table. If the configured routing information has an inactive port, then the routing information is not displayed in the Installed Unicast Routes table.

Setting up SNMP Information

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

Step 2 In the **Read Only Community String** and the **Read Write Community String** fields or front panel menus, enter public (default) or a custom string. Set the password to read or write data from a device and to display diagnostic traps or alarms. This is used when communicating with a device within an SNMP environment. To set a custom community string, enter an alphanumeric character string up to 31 alphanumeric characters in length identifying the password for the device.

Note The community string is case-sensitive.

Step 3 In the **System Name**, **System Location**, and **System Contact** fields, enter the system name, location, and contact information of the D9800 receiver. The system information is sent to the MIB browser, if applicable. The MIB Browser is a third party software used to manage SNMP requests. For more information, contact Cisco Services.

Step 4 Apply the changes.

Adding Trap Destinations

-
- Step 1** From the D9800 web GUI, choose **System Settings > SNMP**. Or, from the Main Menu of the D9800 front panel, choose **Setup > IP > Traps**.
- Step 2** In the **Trap Destination Configuration** area, click the + icon to add an IP address, or choose the **Ins** front panel menu.
- Step 3** In the **Trap Destination IP Address** field or front panel menu, enter the IP address that sets the destination for SNMP trap messages for system events (for example, alarms).
- Step 4** In the **Community String** field or use the right arrow key to choose the **Trap Community String** front panel menu, enter the community string for the trap destination (public or custom string). You can enter up to 35 characters. The default is public.
- Step 5** Click **Save** or apply the changes on the front panel.
-

What to Do Next

To edit or delete an existing trap destination, select the trap destination entry by clicking on the radio button. Make the necessary changes, or click **Delete** to remove the address from the Trap Destination Configuration list.

To edit an existing entry on the front panel, scroll to the IP address and press SELECT to edit the address. To delete an existing entry on the front panel, scroll to the IP address you want to delete and choose **Del**.



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, page 119](#)
- [Alarms, page 120](#)
- [Warnings, page 135](#)
- [Setting up Alarms, page 145](#)
- [Setting up Warnings, page 145](#)
- [Viewing Alarm/Warning History, page 146](#)
- [Viewing the Alarm/Warning Status, page 146](#)

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 145](#) and [Setting up Warnings, on page 145](#).



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 36](#).

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.

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
PE n: ISE Not Auth	Set	Channel is not authorized	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.	Major
PE n: ISE Not Auth	Set	Channel requires an authorization key	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.	Minor
PE n: ISE Not Auth	Set	Channel is blacked out	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.	Minor
PE n: ISE Not Auth	Set	Channel uses an unknown CA system	The conditional access used is not supported. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.	Minor

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
PE n: ISE Not Auth	Set	Channel authorization refused	There is a mismatch in the conditional access. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.	Minor
PE n: ISE Not Auth	Set	Channel requires an IRD with CA support	The conditional access is not supported. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.	Minor
PE n: ISE Not Auth	Set	Channel requires the PE to have an ISE	There is a hardware issue. Clear alarm, reset unit, and notify Cisco Services if problem persists.	Minor
PE n: ISE Not Auth	Set	Security Request Not Applicable	The channel is unauthorized for the current program. Contact your (uplink) service provider to determine whether you are authorized to receive the current program.	Minor
PE n: ISE Not Auth	Clear	Fault Reset or Channel is authorized	Message displayed when alarm is cleared.	Minor
CI Top/Bottom Slot Status	Set	Initialization Fail	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.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
CI Top/Bottom Slot Status	Set	No Descrambling	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.	Major
CI Top/Bottom Slot Status	Clear	CAM Operation OK	Message displayed when alarm is cleared.	Major
IP Redn ProgLoss	Set	Lost PCR	The Program Clock Reference (PCR) program is lost, causing a switch to the backup port if redundancy is configured. Check the tuning parameters and ASI or RF cables.	Major
IP Redn ProgLoss	Clear	Fault Cleared	Message displayed when alarm is cleared.	Major
MPoIPI: DJ HW fail	Set	De-jittering Engine Error, HW Restarted	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.	Major
MPoIPI: DJ HW fail	Clear	Fault Cleared: No errors Fault Cleared: Input disabled	Message displayed when alarm is cleared.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
Decode Overflow	Set	Decode Overflow	The transport rate to the main decoder board exceeds internal bandwidth limits. Reduce the video data rate at the uplink.	Major
Decode Overflow	Clear	Clear	Alarm automatically clears after five seconds.	Major
TS Internal Buffer Over	Set			
TS Input Overflow	Set	TS Input Overflow	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.	Major
TS Input Overflow	Clear	Clear	Alarm automatically clears after five seconds.	Major
PE n CI Status	Set	Program Not Descrambled	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.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
PE n CI Status	Set	1 or more ES Not Descrambled	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.	Major
PE n CI Status	Clear	Descrambling OK	Message displayed when alarm is cleared.	Major
System/Tuner/CI Option/Decoder FPGA Mismatch	Set	System/Turner/CI Option/Decoder Version not in Synch	The unit is not running the selected System/Turner/CI Option/Decoder FPGA version. Reboot the unit with the correct FPGA version.	Major
System/Tuner/CI Option/Decoder FPGA Mismatch	Clear	—	The alarm is cleared when the unit is rebooted with the correct FPGA version.	Major
Download Fault	Set	DL App Delete, DL Finalize App, DL Finalize FPGA, DL Load FPGA, DL Set Next APP, DL Store, or DL Validate	Each download messages have detailed descriptions. Alarm automatically clears before the next download is triggered.	Major
Download Fault	Clear	Clear DL Alarm	Message displayed when alarm is cleared.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
DVB-S2/H264/H265/HD Output/Full HD/UHD Output/Audio 3&4 Not Licensed	Set	DVB S2/H.264/H.265/HD Output/Full HD/UHD Output/Audio 3,4 Not Licensed	An attempt was made to use DVB S2, H.264, H.265, HD Output, Full HD, UHD Output, and/or Audio 3,4 without a valid license. Contact Cisco Services for more information on obtaining the correct license.	Major
DVB-S2/H264/H265/HD Output/Full HD/UHD Output/Audio 3,4 Not Licensed	Clear	DVB S2/H.264/H.265/HD Output/Full HD/UHD Output/Audio 3,4 license fault cleared	The DVB S2, H.264, H.265, HD Output, Full HD, UHD Output, and/or Audio 3,4 is no longer being used or the feature is now licensed.	Major
PE n: Loss of Input	Set	Loss of input detected	There is a loss of input. Ensure that the input has a valid stream.	Minor
PE n: Loss of Input	Clear	Fault reset	Message displayed when alarm is cleared.	Minor
Database Corruption	Set	DB Name: Settings, History, SIRX, or Access	The SQL DB validation utility reports that database SQL file in flash (eMMC) is corrupted. Remove corrupted database file.	Major
Unsupported Vid Format	Set	Unsupported Vid Format	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.	Minor

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
Unsupported AR	Set	Unsupported AR	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.	Minor
Digital Program Mapping	Set	PID Collision	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.	Minor
Digital Program Mapping	Set	Program Collision	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.	Minor
Digital Program Mapping	Set	Mode-i PMT out of range	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.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
Digital Program Mapping	Clear	Digital Program Mapping - OK	Message displayed when alarm is cleared.	Major
Unsupported Vid Prof	Set	Unsupported Vid Prof	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.	Minor
Unsupported Vid Prof	Clear	Problems cleared	Message displayed when alarm is cleared.	Minor
Input Underflow, Input Overflow, Output Underflow, or Output Overflow	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.	Minor
Input Underflow, Input Overflow, Output Underflow, or Output Overflow	Clear	Problems cleared	Message displayed when alarm is cleared.	Minor
Low Intra-Inter scores	Set	Low Intra-Inter scores	Transcoded video quality is degraded and artifacts may be seen in the transcoded video. Possible transcoder firmware error. If problem persists, contact Cisco Services.	Minor
Low Intra-Inter scores	Clear	Quality restored	Message displayed when alarm is cleared.	Minor

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
Throttling fault	Set	Throttling fault	Transcoded video quality is degraded and artifacts may be seen in the transcoded video. Possible transcoder firmware error. If problem persists, contact Cisco Services.	Minor
Throttling fault	Clear	Quality Restored	Message displayed when alarm is cleared.	Minor
Config Mismatch Fault	Set	Config Mismatch Fault	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.	Minor
Config Mismatch Fault	Clear	Mismatch Resolved	Message displayed when alarm is cleared.	Minor
Transcoder load or Init	Set	Transcoder load or Init	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.	Major
Transcoder load or Init	Clear	Load and Init Completed	Message displayed when alarm is cleared.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
System Startup	Set	System Startup	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.	Major
LNB PS	Set	LNBPS: No Load, LNBPS: Over Temperature, or LNBPS: Short Circuit	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.	Minor
LNB PS	Set	LNBPS: Normal/Disabled/Off	Message displayed when alarm is cleared. The LNB power is operating normally.	Minor
Signal Quality	Set	Audio Muted due to RF noise or Poor Quality RF Signal	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.	Minor
Signal Quality	Set	Unstable RF Signal	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.	Minor
Signal Quality	Set	Signal Quality Fault Cleared or Audio Unmuted	Message displayed when alarm is cleared.	Minor

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
Version Mismatch	Set	Version Mismatch	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.	Major
Temperature Alarm	Set	Temperature over Alarm threshold	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.	Major
Temperature Alarm	Clear	Temperature normal	Message displayed when alarm is cleared, indicating that the temperature is within the safe operating range.	Major
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.	Major
Fan	Clear	ecc_reset_fan_alarms	Message displayed when alarm is cleared.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
FPGA Temperature Alarm	Set	ecc_set_fpga_temp_alarm: Alarm: [FPGA name] [value]	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.	Major
FPGA Temperature Alarm	Clear	ecc_reset_fpga_temp_alarm	Message displayed when alarm is cleared, indicating that the FPGA temperature is within the safe operating range.	Major
LEC Timeout	Set	LEC Table Missing/timeout: channels currently unavailable	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.	Major
LEC Timeout	Clear	LEC received	Message displayed when alarm is cleared.	Major
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.	Minor

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
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.	Minor
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.	Minor
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.	Minor
MPoIP Engine Failure	Set	MPEGoIP Overflow. Output Muted. Reduce Content.	The uplink settings my have changed since setting up the unit. The variable bit rate or stamuxed 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.	Minor

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
MPoIP Engine Failure	Set	Critical MPoIP Engine Failure, all active streams must be restarted	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.	Major
MPoIP Engine Failure	Clear	MPEGoIP Output Restored	Message displayed when alarm is cleared.	Minor
MPoIP Engine Failure	Clear	Error Cleared	Message displayed when alarm is cleared.	Major
PE n: CA System Error	Set	No PowerVu support or No Matching CAM	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.	Minor
PE n: CA System Error	Clear	Fault Cleared	Message displayed when alarm is cleared.	Minor
Xcode License fault	Set	Working transcoders are fewer than the licenses	The number of working transcoders are fewer than the number of licenses provisioned. This is a possible hardware failure. Contact Cisco Services.	Major
Xcode License fault	Clear	Transcoder working.	Message displayed when alarm is cleared.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
App Startup Fault	Set	<Version> Failed to start	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.	Major
Transcoder Reset	Set	Firmware Reset On Going	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.	Major
Transcoder Reset	Clear	Firmware Reset Completed	Message displayed when alarm is cleared.	Major
TS Internal Buffer Over	Set	TS Output Overflow	Internal transport processing overflow, due to too much content routed to the transport output path. Reduce output transport content to clear the alarm.	Major
ASI 1 or 2 Input Mute	Set	ASI 1 or 2 Input Muted, Please Check Noise.	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.	Major
ASI 1 or 2 Input Mute	Clear	ASI 1 or 2 Input Noise Cleared & Unmuted.	Message displayed when alarm is cleared.	Major

Alarm	Message Type	Message	Description, with Cause and Remedy	Severity
ASI 1 or 2 Output Status	Set	ASI 1 or 2 Output Overflow & Muted. Please Reduce Content.	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.	Major
ASI 1 or 2 Output Status	Clear	ASI 1 or 2 Output Overflow Cleared & Unmuted.	Message displayed when alarm is cleared.	Major
MOIP 1 or 2 Output Status	Set	MOIP 1 or 2 Output Overflow & Muted. Please Reduce Content.	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.	Major
MOIP 1 or 2 Output Status	Clear	MOIP 1 or 2 Output Overflow Cleared & Unmuted.	Message displayed when alarm is cleared.	Major

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.

Warning	Message Type	Message	Description, with Causes and Remedies
Transcoder Alarm	Set	Failed on PE(s): x,y,z	Software is unable to initialize the transcoder chip. This is a possible hardware issue. Reboot the unit. If the issue is intermittent, the condition may clear after a reboot.
Transcoder Alarm	Clear	Fault Cleared	Message displayed when warning is cleared.
PSI/SI Stream Error TSn	Set	Cannot associate Transport Stream ID between SDT and NIT for channel N Cannot associate Transport Stream ID between PAT and NIT for channel N Cannot associate Transport Stream ID between PAT and SDT for channel N	There is an error in the transport stream ID for the displayed channel. Contact your uplink administrator.
PSI/SI Stream Error TSn	Clear	No PSI/SI Stream Error detected	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.
MOIPI Port n: FECn	Set	FEC COL: configured stream not present FEC ROW: configured stream not present	The FEC input configuration does not match the source. Check the FEC configuration and the incoming stream.
MOIPI Port n: FECn	Clear	FEC COL: configured stream present FEC ROW: configured stream present Fault Cleared: Input disabled	Message displayed when the warning is cleared.

Warning	Message Type	Message	Description, with Causes and Remedies
ASI 1 or ASI 2 Output Overflow	Set	ASI Output N Overflow Fault	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.
ASI 1 or ASI 2 Output Overflow	Clear	ASI Output Overflow Fault Cleared	Message displayed when the warning is cleared.
MOIP1 or MOIP 2 Overflow	Set	MOIP Output N Overflow Fault	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.
MOIP1 or MOIP 2 Overflow	Clear	MOIP Output overflow Fault Cleared	Message displayed when the warning is cleared.
Transport Error	Set	Continuity Count Error	Transport packet continuity count jumped, due to a possible uplink or signal issue. Clear warnings, reset the unit, and notify Cisco Services if the problem persists.
Transport Error	Set	Transport Error Indicator	Transport packets are marked as "errored" upstream of the decoder, due to a possible uplink or signal issue. Clear warnings, reset the unit, and notify Cisco Services if the problem persists.

Warning	Message Type	Message	Description, with Causes and Remedies
Transport Error	Clear	Continuity Count Error Cleared or Transport Error Indicator Cleared	Message displayed when no transport input errors are detected.
Flash Sector Error	Set	Check setting. Counted %d events on %s. See User Manual	A sector on <device> (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 <number> of times on this FLASH during a lifetime. Check if the desired application is running and if the settings are valid.
Video Format Mismatch	Set	Video format mismatch	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 67.
Video Format Mismatch	Clear	Video format match	Message displayed when warning is cleared.
Temperature Warning	Set	Temperature over Warning threshold	The temperature is above normal operating range, due to room temperature too high or blocked air flow. Check openings on front and rear panels for blockage. Lower the room temperature or improve air flow to the device.
Temperature Warning	Clear	Temperature normal	Message displayed when warning is cleared, indicating that the temperature is within the normal operating range.

Warning	Message Type	Message	Description, with Causes and Remedies
FPGA Temperature Warning	Set	ecc_set_fpga_temp_warn: Warning: [FPGA name]	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.
FPGA Temperature Warning	Clear	ecc_reset_fpga_temp_warn	Message displayed when warning is cleared, indicating that the FPGA temperature is within the normal operating range.
Power Warning	Set	ecc_set_power_good_warn: warning slot #1 [#2..]	The voltage for one or more cards is out of range. Contact Cisco Services.
Power Warning	Clear	ecc_reset_power_good_warn	Message displayed when the warning is cleared.
Backup Operation State	Set	Backup Active	The backup state is displayed, for information purposes only. No action required.
Backup Operation State	Clear	Backup Complete	Message displayed when backup is completed.
Restore Operation State	Set	Restore Active	The restore state is displayed, for information purposes only. No action required.
Restore Operation State	Clear	Restore Complete	Message displayed when restore is completed.
Backup Failure Reason	Set	Internal Error	Backup ran out of memory or other internal error. Clear warnings and reset the unit. If the problem persists, contact Cisco Services.
Backup Failure Reason	Clear	Clear	Message displayed when restore is completed.

Warning	Message Type	Message	Description, with Causes and Remedies
Restore Failure Reason	Set	Not Accepted	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.
Restore Failure Reason	Set	Bad Content	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.
MPoIP Bitrate Port #1 or 2	Set	Total configured output is marginal or too high	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.

Warning	Message Type	Message	Description, with Causes and Remedies
MPoIP Bitrate Port #1 or 2	Clear	Total configured output is normal Inactive port, monitoring stopped No active stream(s), monitoring stopped Link is down, monitoring stopped	Message displayed when the warning is cleared.
TDT, SDT, PMT, PAT, NIT, CAT, DRT, MCT, or ECT Timeout n	Set	TDT, SDT, PMT, PAT, NIT, CAT, DRT, MCT n timed out	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.
TDT, SDT, PMT, PAT, NIT, CAT, DRT, MCT, or ECT Timeout n	Set	TDT, SDT, PMT, PAT, NIT, CAT, DRT, MCT, or ECT n is lost	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.
TDT, SDT, PMT, PAT, NIT, CAT, DRT, MCT, or ECT Timeout n	Clear	TDT, SDT, PMT, PAT, NIT, CAT, DRT, MCT, or ECT fault cleared	Message displayed when the warning is cleared.

Warning	Message Type	Message	Description, with Causes and Remedies
ETH REDN: Link Speed	Set	Link speed mismatch detected	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.
ETH REDN: Link Speed	Clear	Link speeds are identical (or not resolved), Link speed is not resolved, or Link speed is not monitored in manual modes	Message displayed when the warning is cleared.
CI Status	Set	Different CA Systems in Top/Bottom slots.	Different CA systems are used in the slots. Replace the CA cards to use the same CA system.
CI Status	Clear	OK	Message displayed when the warning is cleared.
PE License Fault	Set	Uplink Xcodeconfig dropped for PE %u as PE has no HD license	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.

Warning	Message Type	Message	Description, with Causes and Remedies
Xcode Video Buf Offw	Set	PE(s): x;y;z	Transcoder board FPGA reports buffer overflow on video PID path. This is reported when the transcoding chip outputs more data than the path is capable of handling. The limitation is a combined bit rate of all transcoding paths and all delayed paths, and it is when this combined bit rate is above 203.04 Mbps. Verify that the configured overall bit rate for 8 transcoders does not exceed the FPGA path limitation.
Xcode Video Buf Offw	Clear	Fault cleared	Message displayed when the warning is cleared.
Xcode Delay Buf Oflw	Set	PE(s): x;y;z	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.
Xcode Delay Buf Oflw	Clear	Fault cleared	Message displayed when the warning is cleared.
Xcode Delay Pkt Drop	Set	PE(s): x;y;z	Transcoder board FPGA reports packet dropped on delayed PID path. There may be a possible misconfiguration of delay value. The packet delay is caused by arriving too early and it cannot be held in the buffer, or it arrived too late on the delay path. This is a software issue.
Xcode Delay Pkt Drop	Clear	Fault cleared	Message displayed when the warning is cleared.

Warning	Message Type	Message	Description, with Causes and Remedies
ASI 1 or 2 Output Overflow	Set	ASI 1 or 2 Output Overflow Warning	The output rate is higher than level set by the user. Uplink settings may have changed since setting up the unit. Variable bit rate or statmuxed streams may be in use. 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.
ASI 1 or 2 Output Overflow	Clear	ASI 1 or 2 Output Overflow Warning Cleared	Message displayed when the warning is cleared.
MOIP 1 or 2 Output Overflow	Set	MOIP 1 or 2 Output Overflow Warning	The output rate is higher than level set by the user. Uplink settings may have changed since setup of the unit. Variable Bit Rate/Statmuxed streams may be in use. Increase 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.
MOIP 1 or 2 Output Overflow	Clear	MOIP 1 or 2 Output Overflow Warning Cleared	Message displayed when the warning is cleared.

Setting up Alarms

-
- Step 1** From the D9800 web GUI, choose **System Settings > Setup** (under Alarms). Or, from the Main Menu of the D9800 front panel, choose **Setup > Alarm/Warn**.
- 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** Check the **Enable Video Cutoff on Alarm Condition** check box, or choose Enable from the **Alarm Vid Cutoff** front panel menu, to cut off the video output 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. 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).
- Step 5** Apply the changes.
-

Setting up Warnings

-
- Step 1** From the D9800 web GUI, choose **System Settings > Setup** (under Alarms). Or, from the Main Menu of the D9800 front panel, choose **Setup > Alarm/Warn**.
- Step 2** Click the **Warning Setup** link at the bottom of the page.
- Step 3** The **Warning Setup** area displays all the warning messages, or select the **System Warning Name** front panel menu to scroll through the warnings. You can enable or disable each of the warnings, and configure the trap and relay settings. For more information, see [Setting up Alarms, on page 145](#).
Note For more information on the front panel reminder setting, see [Setting up Alarms, on page 145](#).
- Step 4** Apply the changes.
-

Viewing Alarm/Warning History

From the D9800 web GUI, choose **Support > Alarm History**, or from the Main Menu of the D9800 front panel, choose **Diagnostics > Alarms/Warnings > View History**.

The Alarm History page or the View History menu displays all the past system event messages and their set and cleared dates and times. For more information on alarm and warning messages, see [Alarms, on page 120](#) and [Warnings, on page 135](#).

Click **Clear Alarm/Warning History** to clear all the messages in the Alarm History table, or from Main Menu of the D9800 front panel, choose **Diagnostics > Alarms/Warnings > Clear History**.

Viewing the Alarm/Warning Status

From the D9800 web GUI, choose **System Settings > Status**.

The Status page displays all the active event messages for the D9800 system. The Fault Summary section displays the Type of message (alarm or warning) and the number of alarms and warnings that have an active status (Number Active).

The following table shows the Alarm/Warning Status table information:

Status	Description
Type	Shows whether it is an alarm or a warning message.
Name	Name of the alarm or warning.
Text	Content of the message.
Set Since	Date and time of the alarm or warning.

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, page 147](#)

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.

Output Mode	No Output	Passthrough	Service Chans Only	MAP Passthrough	MAP Svc Chans Only	Transcoding (multi-stream unit only, with a transcoder card)
Rate Control	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)
User Rate	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)
Descramble Mode	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Descrambled
Regenerate	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)
Insert Null Packet	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)	Any (unchanged)

Output Mode	No Output	Passthrough	Service Chans Only	MAP Passthrough	MAP Svc Chans Only	Transcoding (multi-stream unit only, with a transcoder card)
Map Mode	Any (not used)	Svc ID	Svc ID	Svc ID & PID	Svc ID & PID	SVC ID & PID
Duplic Mode	Any (not used)	PSI Remap	PSI Remap	Pkt Copy	Pkt Copy	Pkt Copy
Unref	Drop	Pass	Drop	Pass	Drop	Drop
PSI Options	Drop	Ctl By Table	Ctl By Table	Ctl By Table	Ctl By Table	Ctrl By Table
PSI Rate	Any (not used)	SA Std	SA Std	SA Std	SA Std	SA Std
Svc ID	Any (not used)	Valid Ch	Valid Ch	Valid Ch	Valid Ch	Valid Ch
PAT	Not Displayed	Pass	Regen	Regen	Regen	Regen
CAT	Not Displayed	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	Regen
PMT	Not Displayed	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	Regen	Regen	Regen
TSDT	Not Displayed	Pass	Pass	Pass	Pass	Pass
NIT	Not Displayed	Pass	Regen	Regen	Regen	Regen
NITO	Not Displayed	Pass	PwRc	PwRc	PwRc	Drop

Output Mode	No Output	Passthrough	Service Chans Only	MAP Passthrough	MAP Svc Chans Only	Transcoding (multi-stream unit only, with a transcoder card)
SDT	Not Displayed	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	Regen	Regen	Regen	Regen
SDTO	Not Displayed	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	PwRc	PwRc	PwRc	Drop
BAT	Not Displayed	If Descramble Mode is set to Descrambled, it is set to Regen; otherwise, it is set to Pass	PwRc	PwRc	PwRc	Drop
EIT, ECM, EMM, DRT, CDT	Not Displayed	Pass	Pass	Pass	Pass	Drop
TDT, RST, TOT, DIT, SIT	Not Displayed	Pass	Pass	Pass	Pass	Pass
PE Action (all PEs)	Drop	Pass	Pass	Map	Map	XCode

The following table contains values passed to the DPM:

Output Mode	SPTS Service Chans Only	SPTS MAP Svc Chans Only	SPTS Transcoding (multi-stream unit only, with a transcoder card)
Map Mode	Svc ID & PID	Svc ID & PID	Svc ID & PID

Output Mode	SPTS Service Chans Only	SPTS MAP Svc Chans Only	SPTS Transcoding (multi-stream unit only, with a transcoder card)
Duplic Mode	Pkt Copy	Pkt Copy	Pkt Copy
Unref	Drop	Drop	Drop
PSI Options	Ctl By Table	Ctl By Table	Ctl By Table
PSI Rate	SA Std	SA Std	SA Std
Svc ID	Valid Ch	Valid Ch	Valid Ch
PAT, CAT, PMT, SDT	Regen	Regen	Regen
TSDT, NIT, NITO, SDTO, BAT, RST, DIT, SIT, EMM, DRT, CDT	Drop	Drop	Drop
EIT, TOT	Pass	Pass	Pass
TDT	Pass	Drop	Pass
ECM	If Descramble Mode is set to Descrambled, it is set to Drop; otherwise, it is set to Pass	If Descramble Mode is set to Descrambled, it is set to Drop; otherwise, it is set to Pass	If Descramble Mode is set to Descrambled, it is set to Drop; otherwise, it is set to Pass
PE Action (all PEs)	Pass	Map	XCode



Compliance

This section contains the compliance information for the D9800 Network Transport Receiver.

- [Applicable Standards and Notices, page 151](#)
- [Declaration of Conformity, page 154](#)

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 C22.2 No. 60065-03 Incl. AM1 and AM2 - Audio, Video and Similar Electronic Apparatus - Safety Requirements

UL Std. No. 60065-03 (2012) - Audio, Video and Similar Electronic Apparatus - Safety Requirements

Also, this product has been evaluated under the IECCEB scheme to the following international standard:

IEC 60065:2001 (Seventh Edition) + A1:2005 + A2:2010

For the CB report and Certificate, the product is evaluated for the country differences outlined in current CB Bulletin:

National requirements of AR, AT, AU, BE, CA, CH, CN, CZ, DE, DK, ES, FI, FR, GB, HU, IE, IL, IT, JP, KR, MY, NL, NO, PL, SE, SG, SK, SI, UA, US including Group Differences for Am.1 + Am.2 as given in the CB Bulletin.

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 numérique n'émet pas de bruits radioélectriques qui dépassent les limites applicables aux appareils numériques de Class B prescrites dans le règlement sur le brouillage radioélectrique édicté par Industrie Canada.

Unauthorized Modifications

The manufacturer is not responsible for any radio or TV interference resulting from unauthorized modifications made to this equipment. It is the responsibility of the user to correct such interference at his own expense.

Declaration of Conformity



DECLARATION OF CONFORMITY

Cisco Systems Inc. & all its affiliates
 Headquarter at:
 170 West Tasman Drive
 San Jose, CA 95134
 USA

Declare under sole responsibility that the product,

Brand : Cisco

Description : Chassis and cards

Model :

D9800-3G-SDI, D9800-ANALOG, D9800-DVB-CI, D9800-SAT-GEN1, D9800-SS-BASIC, D9800-SS-MPEG-IP

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:

EMC	EN55022:2010 Class B EN55024:2010 EN61000-3-2:2006+A1+A2	EN61000-3-3:2013 CISPR22:2008 CISPR24:2010
Safety	EN60065:2002+A1+A2+A12	
Environmental	EN50581:2012	

EN are relevant harmonized standards.

The product carries the CE Mark, which was first affixed in 2016

Date & Place of issue: 13/MAY/16, San Jose

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DofC# EU64535, Rev# 1