Installing the D9800 Network Transport Receiver

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

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

- Safety Guidelines, on page 1
- Mounting a D9800 Receiver to a Rack, on page 2
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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 ((choice), 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-MPEG0IP), 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.

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

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

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

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

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

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

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

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

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

Maintenance of EMC Compliance

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

Connecting to the Satellite Input

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

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

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

Connecting the RF Inputs

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

Connecting the ASI Input

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

Connecting the Video Outputs

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

Connecting the Composite Video Output

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

Connecting the SDI Outputs

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

Connecting the HDMI Output

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

Connecting the Audio Outputs

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

Connecting the Digital Audio Outputs

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

Note

The digital audio output is always 75-ohm single-ended.
Connect digital audio output broadcast equipment to the AES-3id connectors. The two stereo channels are useful for Dolby Digital 5.1 pass-through applications. Use a high-quality, double-shielded RG6 coaxial cable.

**Connecting the Balanced Audio Output**

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

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

*Figure 3: Balanced Audio Output Terminal Block Connector*

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

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

**Connecting the IP TS Input/Output**

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

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

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

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

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

External Alarm System Connector

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

Changing the Relay Mode for Alarm Monitoring

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

Note

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

Step 1
From the Main Menu of the D9800 front panel, choose Setup > Outputs > Cueing > Relay Mode.

Step 2
Choose Alarm.

Step 3
Save your changes. The rear panel connector pin states will change to that shown in the table below for Alarm mode.

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

Note

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

Cue Tone/Cue Trigger Interface

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

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

**Connecting the Cue Tone Interface**

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

**Connecting the Cue Trigger Interface**

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

**Configuring Open-collector Outputs**

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

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

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

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

Viewing the Hardware Information

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

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

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

The following icons are displayed in the User Address field:

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