



Dolby Cinema Processor CP950 Manual

Issue 4

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PRODUCT MODEL:

THIS DOCUMENTATION APPLIES TO MODEL CID1019

THIRD-PARTY SOFTWARE ATTRIBUTION

A LIST OF THE THIRD-PARTY SOFTWARE USED IN THIS PRODUCT IS AVAILABLE AT: www.dolbycustomer.com

Regulatory Notices

United States (FCC)

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

European Union

The Dolby Cinema Processor CP950 complies with the EMC requirement of EN55024 and EN55032 when operated in accordance with this manual.

WARNING: This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Canada

This Class A digital apparatus complies with Canada CAN ICES-3 (A)/NMB-3 (A). Cet appareil de la classe A est conforme à la norme CAN ICES-3 (A)/NMB-3 (A) de Canada.

China

警告

此为 A 级产品。在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对干扰采取切实可行的措施。



仅适用于海拔 2000 m 以下地区安全使用

Korea

(A)

,가
















Important Safety Instructions









This symbol is intended to alert the user to the presence of important safety, operating, or maintenance instructions.



This symbol is intended to alert the user to the presence of uninsulated “dangerous” voltage within the product enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

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.  **WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
7.  Clean only with dry cloth.
8.  Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9.  No naked flame sources, such as lighted candles, should be placed on the apparatus.
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.  Unplug this apparatus when unused for long periods of time.
13.  Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the 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.
14.  Do not expose the apparatus to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
15.  **CAUTION:** Troubleshooting must be performed by a trained technician. To reduce the risk of electric shock, do not attempt to service this equipment unless you are qualified to do so.
16.  Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
17.  This apparatus must be earthed (grounded) by connecting to a correctly wired and earthed power outlet.
18.  Ensure that your mains supply is in the correct range for the input power requirement of the unit.
19.  In order to reduce the risk of electrical shock, the power cord must be disconnected when the power supply assembly is removed.
20.  This equipment is designed to mount in a suitably ventilated 19” rack; ensure that any ventilation slots in the unit are not blocked or covered.

-  21. The mains power disconnect device for this unit is the plug-in mains cord rather than a power switch. The mains cord must remain readily accessible for disconnecting mains power.
-  22. To avoid exposure to dangerous voltages and to avoid damage to the unit, do not connect the rear-panel RJ45 ports to telephone circuits.
-  23. As the colors of the cores in the mains lead may not correspond with the colored markings identifying the terminals in your plug, proceed as follows:
- The green and yellow core must be connected to the terminal in the plug identified by the letter E, or by the earth symbol \perp , or colored green, or green and yellow.
 - The blue core must be connected to the terminal marked with the letter N or colored black.
 - The brown core must be connected to the terminal marked with the letter L or colored red.
 - The plug must always be installed onto stripped end cords by qualified service personnel.
 - The international power cord is not intended for use in North America.
-  24. CAUTION: The battery inside the unit is not replaceable, and it must be disposed with the unit according to local laws. For additional information, see Product End-Of-Life Information at the bottom of this page.
- ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebus les batteries usagées selon les instructions.
-  25.  CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.
ATTENTION: Double pôle/fusible sur le neutre. Débrancher l'alimentation avant l'entretien.

Product End-Of-Life Information

This product is electronic equipment and should be disposed of in accordance with all applicable laws. Do not dispose as household waste. Do not dispose of the product in a fire. Please dispose of this product by taking it to your local electronic waste collection point or recycling center. For information regarding where to recycle electronic equipment, contact your local dealer. For additional information regarding Waste Electrical and Electronic Equipment (WEEE) and product disposal go to <http://www.dolby.com/us/en/about/environmental-commitment.html>

IMPORTANT SAFETY NOTICE

These units comply with safety standard EN60950-1. These units shall not be exposed to dripping or splashing and no objects filled with liquids, such as coffee cups, shall be placed on the equipment. To ensure safe operation and to guard against potential shock hazard or risk of fire, the following **must** be observed:

- o Ensure that your mains supply is in the correct range for the input power requirement of the unit.
- o Ensure **fuses** fitted are the **correct rating and type** as marked on the unit.
- o The unit **must be earthed** by connecting to a correctly wired and **earthed** power outlet.
- o The **power cord** supplied with this unit must be wired as follows:

(GB)

Live—Brown Neutral—Blue Earth—Green/Yellow

IMPORTANT – NOTE DE SECURITE

Ces unités se conformer à la norme de sécurité EN60950-1. Ne pas exposer ces appareils aux éclaboussures ou aux gouttes de liquide. Ne pas poser d'objets remplis de liquide, tels que des tasses de café, sur l'appareil. Pour vous assurer d'un fonctionnement sans danger et de prévenir tout choc électrique ou tout risque d'incendie, veuillez à ob les recommandations suivantes.

- o Le selecteur de tension doit être placé sur la valeur correspondante à votre alimentation réseau.
- o Les fusibles doivent correspondre à la valeur indiquée sur le matériel.
- o Le matériel doit être correctement relié à la terre.
- o Le cordon secteur livré avec le matériel doit être câblé de la manière suivante:

(F)

Phase—Brun Neutre—Bleu Terre—Vert/Jaune

WICHTIGER SICHERHEITSHINWEIS

Diese Geräte erfüllen die Sicherheitsnorm EN60950-1. Die Geräte darf nicht mit Flüssigkeiten (Spritzwasser usw.) in Berührung kommen; stellen Sie keine Gefäße, z.B. Kaffeetassen, auf die Geräte. Für das sichere Funktionieren der Geräte und zur Unfallverhütung (elektrischer Schlag, Feuer) sind die folgenden Regeln unbedingt einzuhalten:

- o Der Spannungswähler muß auf Ihre Netzspannung eingestellt sein.
- o Die Sicherungen müssen in Typ und Stromwert mit den Angaben auf dem Gerät übereinstimmen.
- o Die Erdung des Gerätes muß über eine geerdete Steckdose gewährleistet sein.
- o Das mitgelieferte Netzkabel muß wie folgt verdrahtet werden:

(D)

Phase—braun Nulleiter—blau Erde—grün/gelb

NORME DI SICUREZZA – IMPORTANTE

Queste unità sono costruiti a norma di sicurezza EN60950-1. I prodotti non deve essere sottoposto a schizzi, spruzzi e gocciolamenti, e nessun tipo di oggetto riempito con liquidi, come ad esempio tazze di caffè, deve essere appoggiato sul dispositivo. Per una perfetta sicurezza ed al fine di evitare eventuali rischi di scossa elettrica o d'incendio vanno osservate le seguenti misure di sicurezza:

- o Assicurarsi che il selettore di cambio tensione sia posizionato sul valore corretto.
- o Assicurarsi che la portata ed il tipo di fusibili siano quelli prescritti dalla casa costruttrice.
- o L'apparecchiatura deve avere un collegamento di messa a terra ben eseguito; anche la connessione rete deve avere un collegamento a terra.
- o Il cavo di alimentazione a corredo dell'apparecchiatura deve essere collegato come segue:

(I)

Filo tensione—Marrone Neutro—Blu Massa—Verde/Giallo

AVISO IMPORTANTE DE SEGURIDAD

Estas unidades cumplen con la norma de seguridad EN60950-1. Estas unidades no debe ser expuesta a goteos o salpicaduras y no deben colocarse sobre el equipo recipientes con líquidos, como tazas de café. Para asegurarse un funcionamiento seguro y prevenir cualquier posible peligro de descarga o riesgo de incendio, se han de observar las siguientes precauciones:

- o Asegúrese que el selector de tensión esté ajustado a la tensión correcta para su alimentación.
- o Asegúrese que los fusibles colocados son del tipo y valor correctos, tal como se marca en la unidad.
- o La unidad debe ser puesta a tierra, conectándola a un conector de red correctamente cableado y puesto a tierra.
- o El cable de red suministrado con esta unidad, debe ser cableado como sigue:

(E)

Vivo—Marrón Neutro—Azul Tierra—Verde/Amarillo

VIKTIGA SÄKERHETSÅTGÄRDER!

Dessa enheter uppfyller säkerhetsstandarden EN60950-1. Dessa enheter får inte utsättas för yttre åverkan samt föremål innehållande vätska, såsom kaffemuggar, får ej placeras på utrustningen. För att garantera säkerheten och gardera mot eventuell elchock eller brandrisk, måste följande obas:

- o Kontrollera att spänningsväljaren är inställd på korrekt nätspänning.
- o Kontrollera att säkringarna är av rätt typ och för rätt strömstyrka så som anvisningarna på enheten föreskriver.
- o Enheten måste vara jordad genom anslutning till ett korrekt kopplat och jordat el-uttag.
- o El-sladden som medföljer denna enhet måste kopplas enligt följande:

(S)

Fas—Brun Neutral—Blå Jord—Grön/Gul

BELANGRIJK VEILIGHEIDS-VOORSCHRIFT:

Deze eenheden voldoen aan de EN60950-1. Deze apparaten mag niet worden blootgesteld aan vocht. Vanwege het risico dat er druppels in het apparaat vallen, dient u er geen vloeistoffen in bekertjes op te plaatsen. Voor een veilig gebruik en om het gevaar van elektrische schokken en het risico van brand te vermijden, dienen de volgende regels in acht te worden genomen:

- o Controleer of de spanningscarroussel op het juiste Voltage staat.
- o Gebruik alleen zekeringen van de aangegeven typen en waarden.
- o Aansluiting van de unit alleen aan een geaarde wandcontactdoos.
- o De netkabel die met de unit wordt geleverd, moet als volgt worden aangesloten:

(NL)

Fase—Bruin Nul—Blauw Aarde—Groen/Geel

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Introduction

The Dolby® Cinema Processor CP950 is the next-generation cinema processor from Dolby Laboratories, which continues its leadership in the development of innovative cinema technologies. The CP950 architecture is a modular design that enables ease of maintenance and future upgrades. The CP950 supports multichannel PCM, Dolby Digital, Dolby Digital Plus™, Dolby E, and Dolby TrueHD.

With the CP950, you can present high-quality audio from the following audio sources:

- Dolby Digital Cinema playback systems
- Onscreen advertising servers
- Digital video tape recorders (VTRs)
- Digital satellite or cable TV receivers
- Blu-ray Disc™
- DVDs

The CP950 provides the following audio input connectors:

- 8 × AES (16 channels) digital audio input
- HDMI input and repeater output
- Stereo nonsync inputs (RCA)
- Microphone input (XLR)
- Two 1 × AES In BNC Connectors

The CP950 provides the following audio output connectors:

- Dolby Atmos Connect (16-channel digital) using AES67 or BLU Link
- 16-channel analog audio outputs for legacy amplifiers
 - The analog audio outputs are balanced TASCAM® female DB25 connectors.
- Hearing impaired and visually impaired analog output channels (RCA)

The CP950 has an Ethernet port to accommodate control and setup through a web browser interface. To control automation from a Dolby Digital Cinema server or third-party device, you can use the Ethernet or serial interface.

You can configure the CP950 with macros that accept audio using the system inputs. An independently adjustable global audio delay is assigned to each macro to ensure that sound and picture are perfectly synchronized. You can assign unique delays to different macros using the same input. This provides flexibility for alternative content sources, which often require different delays.

The CP950 utilizes high-resolution multiple-rate equalization for all channels. You can perform the setup manually using the CP950 web client user interface through the standard one-third octave equalization. Advanced users can run the automatic equalization process in Dolby Atmos Designer (DAD) v3.2 or later software. You can download the current version of DAD software by clicking **downloads** in the CP950 web client. You can also download the current version of DAD software, release notes, and manual at www.dolbycustomer.com. In addition, you can access the DAD manual and release notes from the DAD software **Help** menu.

You can back up CP950 settings to a PC and restore the backup to another CP950 if you experience a hardware or software failure. This minimizes the need for additional calibration after repairs or unit replacement.

If you replace another cinema processor with a CP950 (for example, a Dolby CP850-Base, CP750, CP650, or third-party cinema processor), re-equalizing the room for the CP950 is required.

1.1 About This Manual

This manual shows you how to install and operate a Dolby Cinema Processor CP950 using the front-panel touch screen and web client user interface.

This chapter covers:

- [CP950 Front Panel](#)
- [CP950 Rear Panel](#)

1.2 CP950 Front Panel

Figure 1-1 shows the CP950 front-panel components.

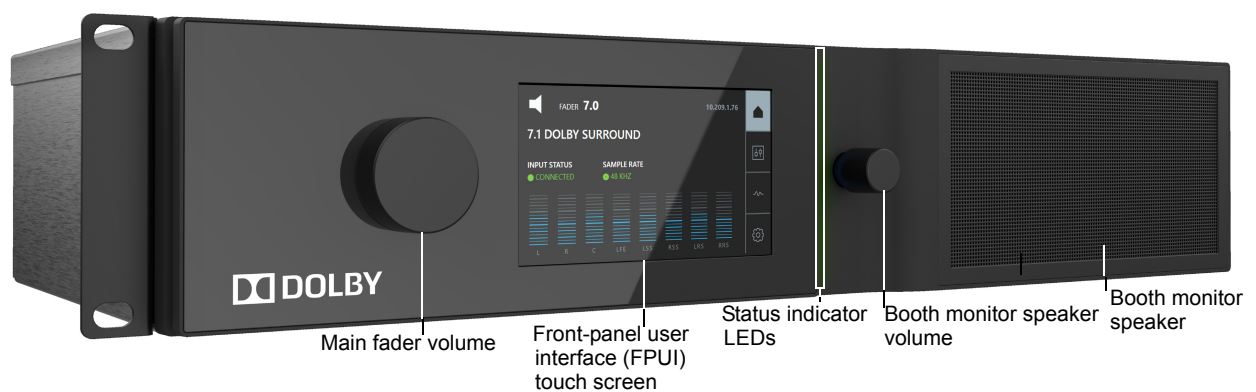


Figure 1-1 CP950 Front Panel

Following is a description of the CP950 front-panel components.

1.2.1 Front-Panel User Interface Touch Screen

Pressing soft buttons on this front-panel user interface (FPUI) touch screen enables you to set up the network, mute/unmute the fader (by clicking the speaker icon), activate macros, configure and view system settings, and view the technical-support contacts and other information. The following figure shows the FPUI home screen, which displays the mute/unmute control, fader level, current IP address, active macro, input status, sample rate, audio meter, and menu buttons.

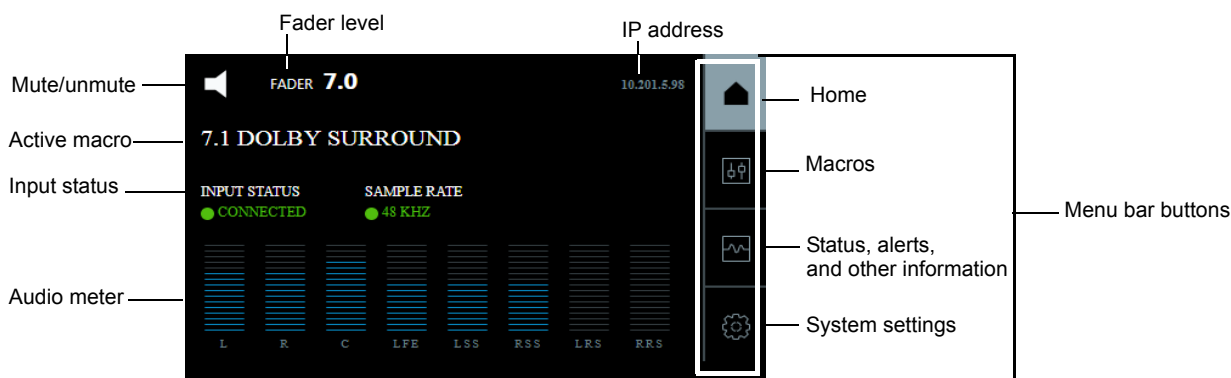


Figure 1-2 Front-Panel User Interface Touch Screen

Input Status Display

If the currently active macro specifies AES inputs, the input status displays as follows:

- **Connected** indicates that all expected digital input signals are locked (illuminated in green).
- **Disconnected** indicates that one or more expected digital inputs are not locked (illuminated in red).
- **Check Cables** indicates that one or more expected digital inputs are dropping out intermittently (illuminated in yellow).

If the currently active macro specifies HDMI inputs, the input status displays as follows:

- **Connected** indicates that the system detects an HDMI connection (illuminated in green).
- **Disconnected** indicates that the system does not detect an HDMI connection (illuminated in red).

If the currently active macro does not specify AES or HDMI (as applicable for non-sync and microphone), the input status displays **N/A**.

Macro Display and Activation

To display and activate a macro:

1. Press the macro button in the menu bar to display a scrollable list of available macros, as shown in [Figure 1-3](#), then locate and press the macro you want to activate. The current macro is highlighted in green.

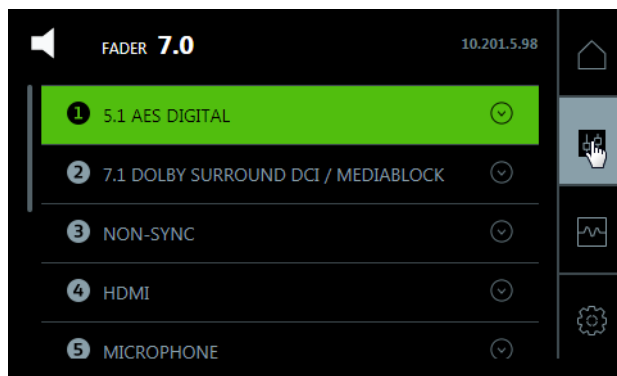


Figure 1-3 Press Macro Button

A dialog box appears with two options, **ACTIVATE** and **DETAILS**.

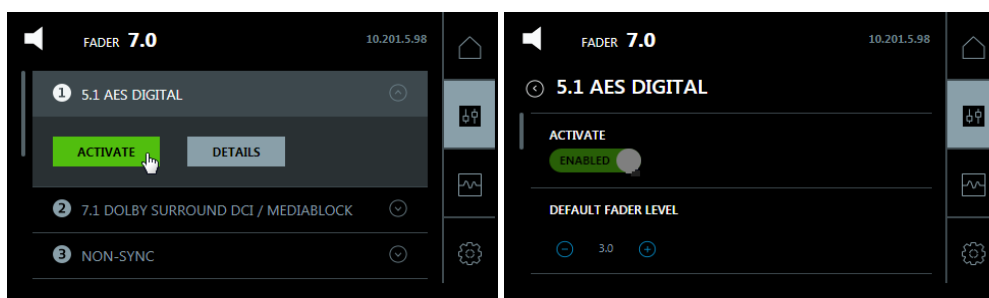


Figure 1-4 Activate Macro and Set Default Fader Level

2. Press **ACTIVATE** to enable the selected macro. Press **DETAILS** to view the parameters for the selected macro. You can set the default fader level when the **macro** is **ENABLED**.

Information Display

To display alerts, input status, bitstream information, and support contacts, press the information button, and then press the desired item.

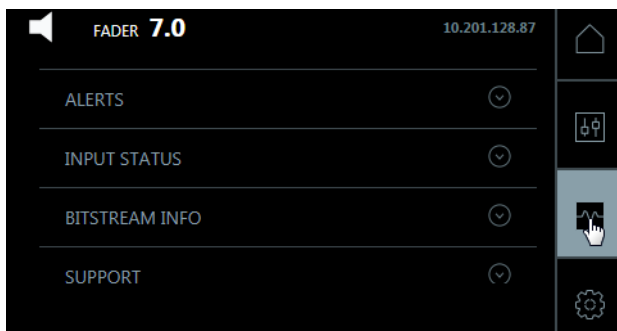


Figure 1-5 System Information

Following is a description of the information display items.

Alerts

Displays any active system alerts. In some cases, you can suppress these alerts; However, higher priority alerts cannot be suppressed.

Input Status for HDMI and 8 x AES

Displays current connected input status.

Bitstream Info

If the selected macro uses a digital input, the system displays the relevant bitstream information.

Support

Displays contact information for Dolby Cinema Solutions and Support.

System Settings Display and Configuration

To configure and display the device tools, command network settings, or other device information, press the system settings button, and then press the desired item.

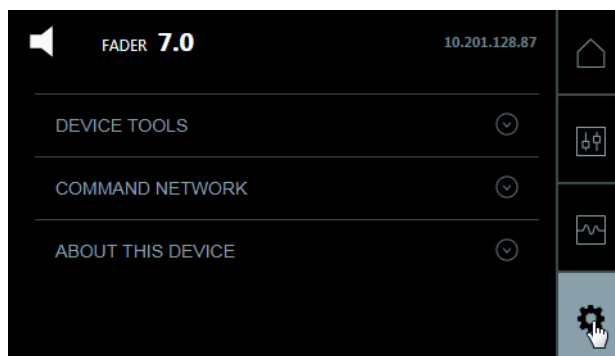


Figure 1-6 System Settings

Following is a description of the system settings display and configuration items.

Device Tools

Allows you to change the output of the booth monitor. The default is L, C, R.

Center channel bypass routes all of the center channel audio to left and right speakers. This is helpful if there is a bad speaker component in the center channel.

In addition, you can activate phantom power for the XLR microphone input, and reboot the CP950.

Command Network

Allows you to change the **COMMAND** Ethernet port configuration. The **COMMAND** port default IP address is 192.168.1.151.

About this Device

This screen displays information regarding the CP950, including software version, and serial numbers.

1.2.2 Main Volume (Fader) Knob

This large knob on the left side of the front panel allows you to control the auditorium sound level. A fader setting of 7.0 is the nominal correct operating level. The main fader knob rotates continuously with no end stops.

When you adjust the volume between 0 and 4.0, the output level changes in 20 dB steps between -90 and -10 dB. When you adjust the volume between 4.0 and 10, the output level changes in 3.33 dB steps between -10 and $+10$ dB. The following figure shows the characteristic graph.

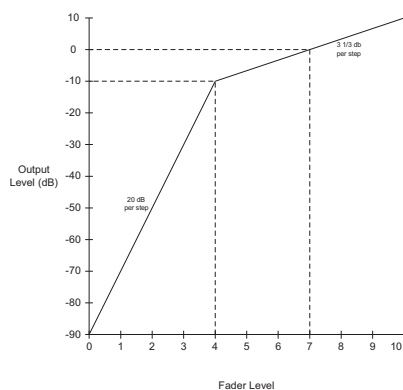


Figure 1-7 Fader Characteristic

1.2.3 Booth Monitor Speaker

With this front-panel speaker, you can monitor any PCM input on the $8 \times$ AES input, $1 \times$ AES B/AES C inputs, and any speaker channel prior to speaker crossovers (with the limiter and -10 dB pad applied, or the LCR downmix). The LCR downmix is the default, which is set each time you reboot the system.

1.2.4 Booth Monitor Speaker Volume

With this smaller right-side volume knob, you can adjust the booth monitor speaker volume.

1.2.5 Status Indicator LEDs

There are four LEDs on the right side of the FPUI. All of these LEDs illuminate at the same time in a specific color, depending upon the status state.

LED Color	State
Yellow	Unit is powering up but not operating (booting)
Red	Unit is powered but not operating (fatal error)
Green	Unit is powered and operational
Yellow	Unit is powered and there is an error or alert

1.3 CP950 Rear Panel

The following figure shows the CP950 rear-panel components.

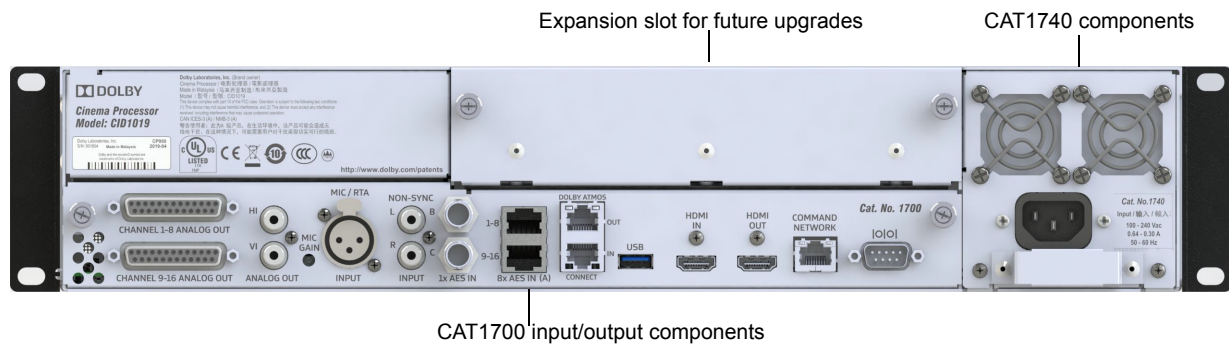


Figure 1-8 CP950 Rear Panel

1.3.1 CAT1700 Input/Output Components

The CP950 receives analog and digital audio through its input connectors. The system processes audio and applies equalization.

Audio output is available using the analog or digital connections or a combination of analog and digital. The CP950 supports a maximum of 16 channels.

- Analog audio output is transmitted via two DB25 connectors: channels 1–8 on one connector and channels 9–16 on the other connector. Both connectors are female and follow the TASCAM pinout. See [Appendix A](#) for the pinout details.
- Digital audio output is transmitted via the Dolby Atmos Connect ports. These RJ45 Ethernet connectors support audio using AES67 or BLU Link protocols. For more information on configuring these protocols, see [Section 3.5](#).



Warning: To avoid exposure to dangerous voltages and to avoid damage to the unit, do not connect the rear-panel RJ45 ports to telephone circuits.

Installing a CP950 is similar to a CP750 installation. You choose between a 5.1 or 7.1 room configuration, and analog or digital outputs. The system uses full-range audio to feed external amplifiers or crossovers.

You can apply internal crossover filters using Dolby Atmos Designer software, version 3.2 or later. In addition, you can change the routing parameters to use both analog and digital outputs (cannot exceed 16 channels).

Following is a description of the CP950 CAT1700 input/output components (from left to right).

Channels 1–8 Analog Out/Channels 9–16 Analog Out

These 25-pin female output D-connectors can provide up to 16 channels of balanced analog audio output to legacy amplifiers.



Caution: You can use all digital channels, or all analog channels, or a mix of analog and digital channels, but cannot exceed 16 channels of output. Additionally, if you use CP950 crossovers, you cannot split the output of a speaker between analog and digital.

Hearing Impaired (HI) Connector

You can use this RCA analog audio output for hearing impaired output. By default, the system routes AES channel 7 to this output. Audio is heard only when activity is present on AES channel 7. You can configure hearing-impaired routing using the web client **macro editor**. Changing the AES assignment for channel 7 to **not used** changes the system so that it generates a mix of Left, Center, and Right channels and outputs audio from the **HI** connector. This is useful if you play content that does not have a hearing impaired track. You can also enable timing changes for the 8 × AES input macro using the **macro editor**. This can help you to accurately synchronize the hearing impaired audio with the auditorium sound.

Visually Impaired (VI) Connector

You can use this RCA analog audio output for visually impaired narration that is typically transmitted from AES channel 8. You can configure the visually impaired routing using the web client **macro editor**. You can also enable timing changes for the 8 × AES input macro on this input using the **macro editor**. This can help you to accurately synchronize the visually impaired narration audio with the auditorium sound.

Microphone Gain

This multiple-turn trimpot adjusts the gain of the mic preamp. If you use the microphone input for public address purposes, adjust this control for the desired volume in the auditorium.

Microphone or RTA Input

This XLR connector allows you to connect and use a microphone with the CP950. You can also use this connector for a Real-Time Analyzer (RTA) input.

Note that some microphones require phantom power (+48 V), which you can enable or disable in the CP950 web client or FPUI.

Nonsync Input Connectors

The nonsync input allows you to connect a two-channel line-level source on two RCA jacks labeled **L** and **R** that accept $3 V_{\text{RMS}}$ maximum input.

1x AES In Connectors

Two BNC connectors accommodate PCM audio at 96, 48, 44.1, and 32 kHz (at 16, 20, and 24 bits), and Dolby Digital and Dolby Digital Plus at all data rates and sample rates. You can use BNC B for BLU Link word clock.

8x AES In Ports

These RJ45 ports can receive eight AES/EBU streams (two channels per stream, providing 16 input channels). The eight AES input signals must be time aligned with each other. Typically, this input connects to the main audio output on a digital playback system.

The web client **macro editor 16ch, DCI Projector/MediaBlock** input source setting, (see [Figure 3-15](#)) accepts PCM audio at 48 kHz and 96 kHz.

The web client **macro editor 16ch, AES Digital** input source setting (see [Figure 3-16](#)) accepts Dolby Digital, Dolby Digital Plus, Dolby E, or PCM audio at 32, 48, 96, 192, or 44.1 kHz sample rates. The decoding of coded audio (Dolby Digital or Dolby E) is restricted to the first AES3 channel pair. This connector has a floating ground. Channels 1–8 connect through the top port, while channels 9–16 connect through the bottom port.

Dolby Atmos Connect In and Out Ports

These two RJ45 ports can transmit up to 16 channels of AES67 audio to a Dolby Multichannel Amplifier, DAC3202, or another compatible device. BLU Link is also supported.



Caution: When you are using these digital audio outputs along with the analog audio outputs, you cannot exceed 16 total channels and cannot split up crossover outputs for a single speaker location.

HDMI In and Out Connectors

These HDMI 2.0 and HDCP 2.2 compliant connectors allow you to use any HDMI device as an audio source. The CP950 passes the selected HDMI input video data to the HDMI output connector. See the pinouts in [Section A.1](#).

Command Network Port

This Gigabit Ethernet port connects the CP950 to a Dolby Digital Cinema auditorium network. You use this port to access the web client and for automation commands from digital cinema playback systems or other automation devices. The default port for automation commands via Ethernet is 61408.

RS-232 Serial Port

You can use this 9-pin port for serial control using ASCII string commands. It uses a D-subminiature DB9 data terminal equipment (DTE) male connector. Use a crossover cable to communicate with another DTE device, such as a PC. See [Appendix E](#) for details on the command strings.

The equipment connected to this port should have its serial port set to 9,600 baud, no parity, one stop bit.

The same control functions are available through the Ethernet port.

1.3.2 CAT1740 AC Input

This is a simple, unswitched IEC power inlet module (100–240 VAC, 0.64–0.30 amps, 50–60 Hz).

Installing the CP950 in a Dolby Digital Cinema Network

This chapter provides authorized technicians with instructions for installing the CP950 in a Dolby® Digital Cinema network. It covers:

- [CP950 Packing Kit](#)
- [Mounting the CP950](#)
- [Connecting the CP950 to a Dolby Digital Cinema Playback System](#)
- [Connecting the CP950 to the Auditorium \(Command\) Network](#)
- [Connecting Amplifiers](#)
- [Updating and Configuring the Playback System](#)
- [Wiring the CP950](#)
- [Connecting Cables](#)
- [Starting up the CP950](#)
- [Configuring the Network Settings](#)

2.1 CP950 Packing Kit

In addition to the CP950, your unit ships with these components:

- North America power cable
- International power cable (nonterminated)
- China (CCC) power cable
- Unpinned RJ45/DB25 adapter
- Potentiometer trimmer tool for microphone gain
- CP950 Quick Start Guide

2.2 Mounting the CP950

To avoid heat and hum pickup problems, do not mount the CP950 immediately above or below power amplifiers. Always leave a 1U space (43 mm, or 1.75 inch) above and below the CP950 to provide adequate ventilation. Install an air guide or baffle to deflect any hot air coming from equipment below the CP950.

To ensure good ground contact, install a star washer on at least one (and preferably all) rack-mounting screws, as shown in [Figure 2-1](#). This will also aid in the prevention of electrical noise problems. Proper shielding and termination of cables and cable assemblies are also very important. Follow the methods shown in the wiring diagrams.

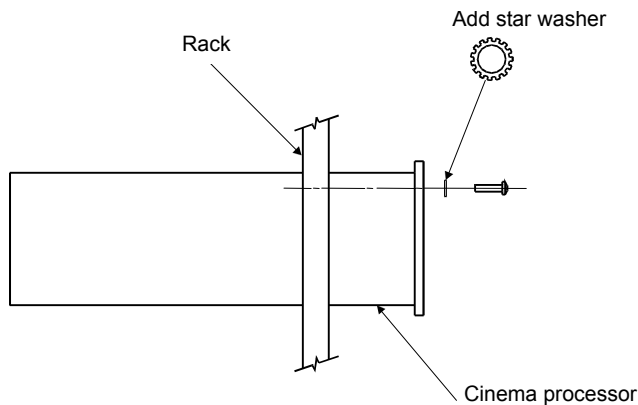


Figure 2-1 Star Washers and Rack-Mounting Screws



Caution: The mains power disconnect device for this unit is the plug-in mains cord rather than a power switch. The mains cord must remain readily accessible for disconnecting mains power.



Caution: This apparatus must be earthed (grounded) by connecting to a correctly wired and earthed power outlet.



Caution: To ensure proper ventilation, do not block the CP950 ventilation cutouts (on the right side of the unit). See [Figure 2-2](#).



Figure 2-2 Ventilation Cutout Locations

2.3 Mains Power Wiring

As the colors of the cores in the mains lead may not correspond with the colored markings identifying the terminals in your plug, proceed as follows:

- Brown wire: Live or hot
- Blue wire: Neutral
- Green wire: Mains ground

In some countries, the primary mains cable may not have a connector fitted. Nonterminated leads must be properly wired to an approved mains connector in accordance with the following international code:

- The green and yellow core must be connected to the terminal in the plug identified by the letter E, or by the earth symbol \perp , or colored green, or green and yellow.
- The blue core must be connected to the terminal marked with the letter N or colored black.
- The brown core must be connected to the terminal marked with the letter L or colored red.
- The plug must always be installed onto stripped end cords by qualified service personnel.
- The international power cord is not intended for use in North America.



Caution: This apparatus must be earthed (grounded) by connecting to a correctly wired and earthed power outlet.



Caution: Ensure that your mains supply is in the correct range for the input power requirement of the unit.



Caution: If you are uncertain about the wiring of your AC mains outlet, do not use it. Consult a qualified electrician.

2.4 Connecting the CP950 to a Dolby Digital Cinema Playback System

This section provides instructions for connecting the CP950 to a Dolby Digital Cinema playback system. Other compatible playback systems require similar connections.

Newer systems (IMS1000, IMS2000, IMB with ShowVault, CAT745 IMB with DSS220) output audio to the CP950 using RJ45 connectors and Ethernet cables.



Warning: To avoid exposure to dangerous voltages and to avoid damage to the unit, do not connect the rear-panel RJ45 ports to telephone circuits.

Other systems (DSS200, DCP-2000, DCP-2K4) output audio using a DB25 connector. For these systems, you need to use the provided DB25-to-RJ45 adapter, which ships unpinned so you can pin the adapter for your requirements. See the different pinout wiring requirements for each of these systems in [Appendix A](#). Note that for the DSS200, you need to use a female-to-female gender changer.

The following sections show you how to connect the ports between a CP950 and each Dolby Digital Cinema playback system.

2.4.1 Connecting an Integrated Media Server or Integrated Media Block to the CP950

To connect an integrated media server (IMS) or integrated media block (IMB) to a CP950, connect the IMS or IMB AES out ports to the CP950 **8x AES INPUT** ports using CAT5e (or greater) Ethernet cables. The example in the following figure shows an IMS2000 connection to a CP950. The IMS1000, IMB with ShowVault, and CAT745 IMB with DSS220 use similar connections. For cases where the cable distance is more than 50 feet (15 meters), we recommend shielded cables.



Figure 2-3 Connecting an IMS2000 to a CP950

2.4.2 Connecting a DSS200 to the CP950

To connect a DSS200 to the CP950:

Connect the DSS200 **8x AES OUTPUT** port to the CP950 **8x AES INPUT** ports with shielded CAT5e (or greater) Ethernet cables using the provided DB25-to-RJ45 adapter. In addition, you need to use a female-to-female gender changer between the DB25-to-RJ45 adapter and the DSS200 AES output port. For adapter wiring instructions and other related information, see [Appendix C](#).

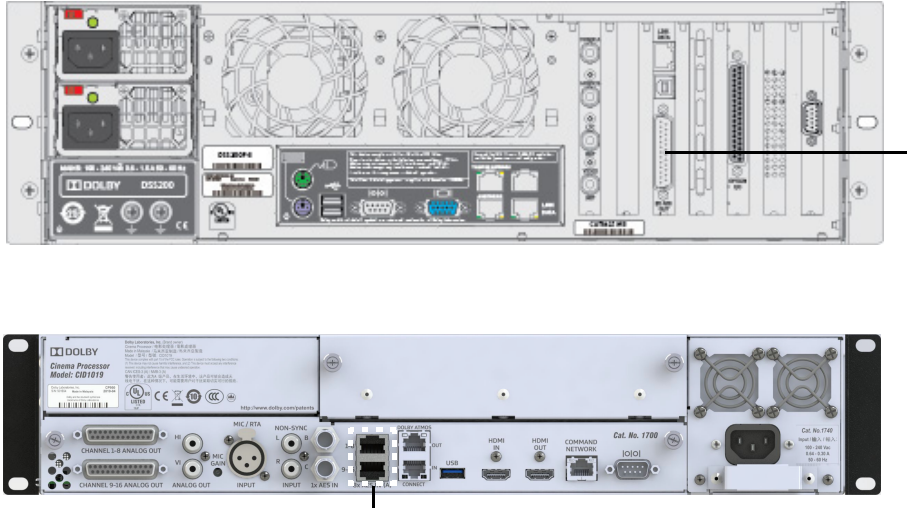


Figure 2-4 Connecting a DSS200 to the CP950 (Requires DB25-to-RJ45 Adapter and Gender Changer)

2.4.3 Connecting a DCP-2000 to the CP950

To connect the DCP-2000 to the CP950, connect the DCP-2000 **AES** output port to the CP950 **8x AES INPUT** ports with shielded CAT5e (or greater) Ethernet cables using the provided DB25-to-RJ45 adapter. For adapter wiring instructions and other related information, see [Appendix C](#).

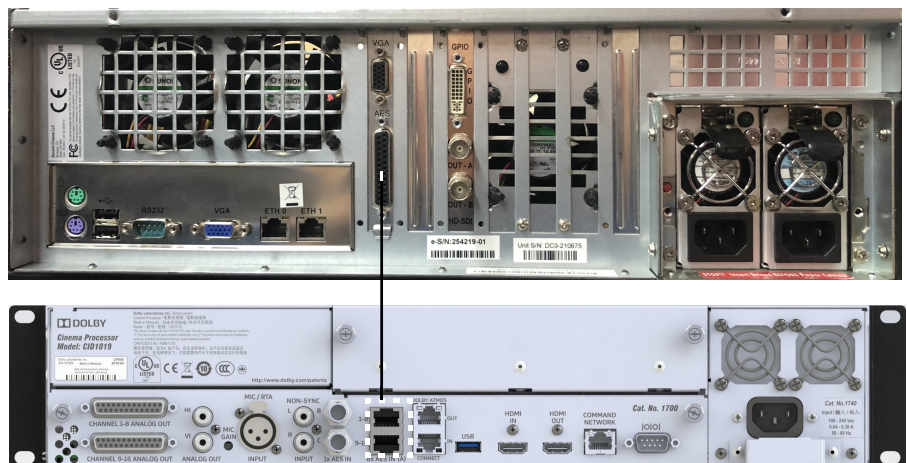


Figure 2-5 Connecting a DCP-2000 to the CP950 (Requires DB25-to-RJ45 Adapter)

2.4.4 Connecting a DCP-2K4 to the CP950

To connect the DCP-2K4 to the CP950, connect the DCP-2K4 **AES** port to the CP950 **8x AES INPUT** ports with shielded CAT5e (or greater) Ethernet cables using the provided DB25-to-RJ45 adapter. For adapter wiring instructions and other related information, see [Appendix C](#).

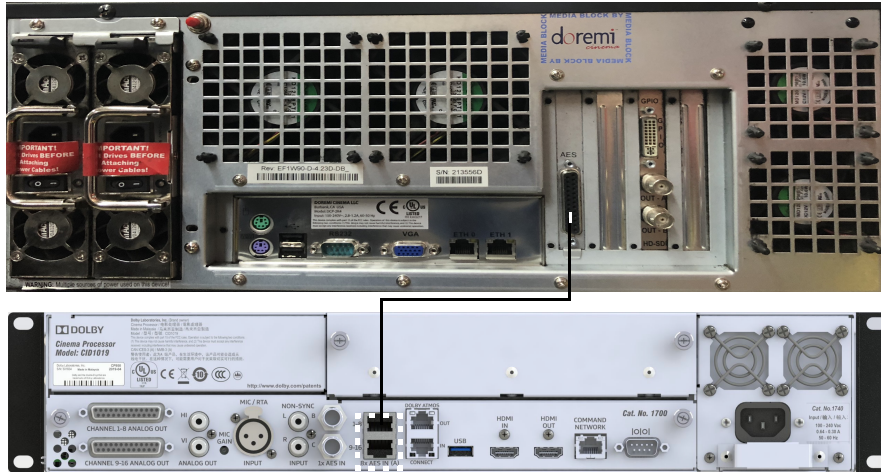


Figure 2-6 Connecting a DCP-2K4 to the CP950 (Requires DB25-to-RJ45 Adapter)

2.5 Connecting the CP950 to the Auditorium (Command) Network

Use a shielded CAT5e (or greater) Ethernet cable to connect the CP950 rear-panel **COMMAND NETWORK** port to the auditorium network switch.

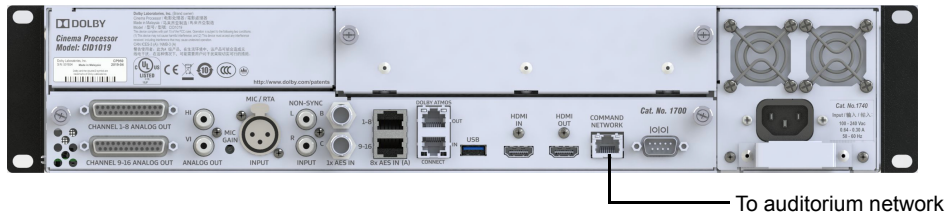


Figure 2-7 Connecting the CP950 to the Auditorium Network

2.6 Connecting Amplifiers

To connect to the auditorium amplifiers:

1. For analog amplifier installs, connect the CP950 **Channel 1–8 Out** (and **Channel 9–16 Out** for 16-channel installs) to the legacy amplifiers.
2. For a Dolby Multichannel Amplifier (or another Dolby Atmos Connect qualified device) installation, use a shielded CAT5e (or greater) Ethernet cable to connect the CP950 **Dolby Atmos Connect Out** port to the **Dolby Atmos Connect In** port on the downstream device.

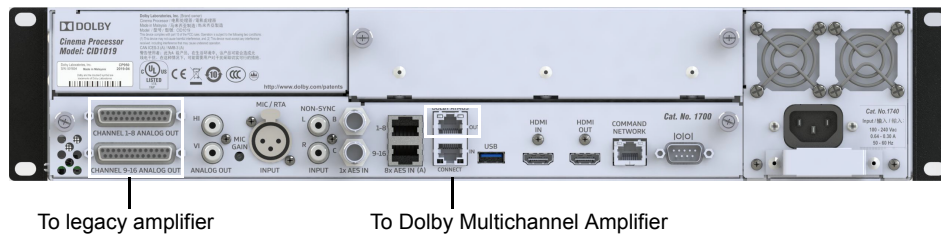


Figure 2-8 Connecting Amplifiers

2.7 Updating and Configuring the Playback System

To update and configure your playback system:

- Update the DSS220 or DSS200:
 - Use software version 4.9.4 or later, which adds the CP950 automation commands.
 - Run the DSS Config script to select the CP950 as your cinema processor.
 - If needed, use the Media Block setup software to set the media block delays.
- Update the DCP-2000, DCP-2K4, IMB ShowVault, IMS1000, or IMS2000 with the CP950 cue bundle package.

You can download all the updated software and cue bundle package at <https://www.dolbycustomer.com>.

Refer to your respective Dolby Digital Cinema playback system documentation for instructions on how to perform these tasks.

2.9 Connecting Cables

For proper operation in locations where there is considerable interference, strictly adhere to the recommended cable types, lengths, and pin assignments. Shields must connect only to the chassis and should not be paralleled with the negative side of inputs or outputs.

Connector pinouts are listed in [Appendix A](#).

2.10 Starting up the CP950

The CP950 automatically powers up when you connect the power cable. While the unit is booting, the front-panel status LEDs flash in yellow. After approximately one minute, the unit completes the startup process. When the boot process is complete, the LEDs illuminate in solid green, and the front-panel touch-screen user interface (FPUI) displays the home screen with the current fader setting, IP address, input status, sample rate, and audio meter.

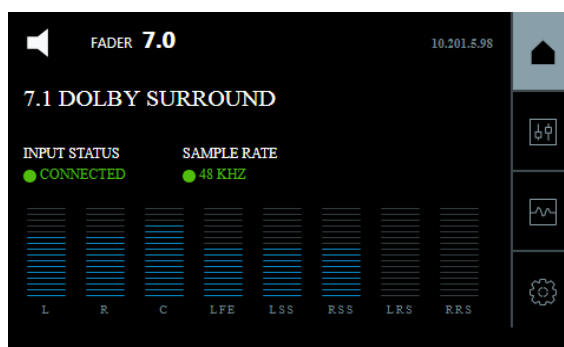


Figure 2-10 Front-Panel User Interface Touch Screen

2.11 Configuring the Network Settings

To configure the network settings:

1. Press the system settings button, and then press **COMMAND NETWORK**.

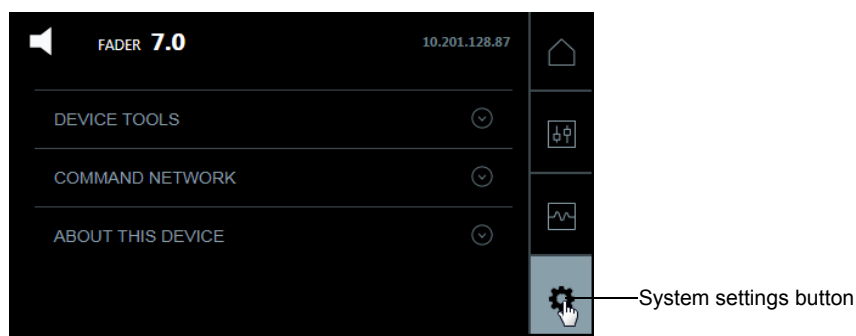


Figure 2-11 Front-Panel User Interface Touch Screen

The **COMMAND** port default IP address is 192.168.1.151. You will need to change the third octet to match your auditorium number, or change the entire IP address (if required).

2. To configure the **COMMAND NETWORK** port, press the small pencil icon next to the IP address.

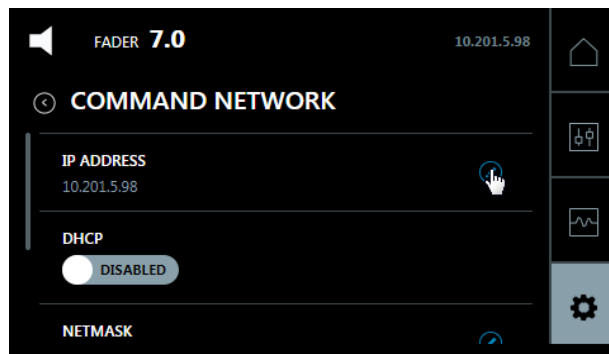


Figure 2-12 Press IP Address Icon

A soft keyboard appears where you can change the IP address.

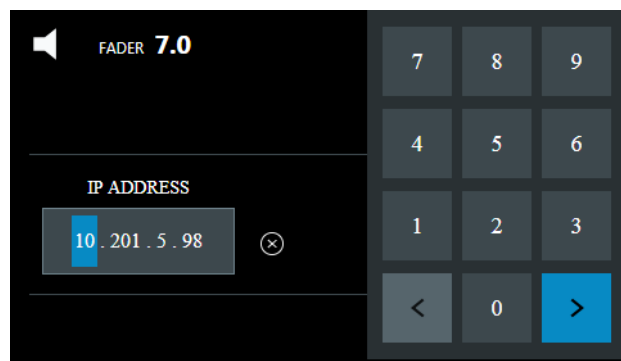


Figure 2-13 Configure IP Address

3. Use the soft keyboard to change the third octet to your auditorium number. The right arrow changes from blue to green. Press it to confirm.
4. Repeat steps 3 and 4 for the **Netmask**.
5. Repeat steps 3 and 4 for the **Gateway**.



Note: After starting up the system and configuring the network settings, you can use your web browser to connect to the CP950, as described in [Section 3.1](#).

2.12 Performing USB Functions

You can use the CP950 USB port to perform specific functions by inserting a USB storage device (flash drive) and adding a file with one of the following file names (with no file extension) to the root of the USB device. Supported file systems are FAT and FAT32.

- `extract-logs` generates a report named `cp950_logs.tgz` on the USB device.
- `backup` generates a report named `cp950_logs.tgz` and a backup file named `dolbyAtmosConfiguration.dac` on the USB device.
- `factory-reset` generates a report named `cp950_logs.tgz` and a backup file named `dolbyAtmosConfiguration.dac` on the USB device, and performs a factory reset of the CP950 (deleting all configurations and restoring the unit to a factory-fresh state).

Using the Web Client User Interface

This chapter shows you how to operate the CP950 using the web client user interface. It covers:

- [Connecting to the CP950](#)
- [Configuring Macros](#)
- [Displaying the Equalization Screen](#)
- [Displaying the Auditorium Parameters](#)
- [Configuring Preferences](#)
- [Viewing and Downloading the System Logs](#)
- [Setting up User Access](#)
- [Modifying the Network Settings](#)
- [Performing Maintenance Tasks](#)
- [Rebooting the System](#)
- [Downloading CP950 Essentials](#)
- [Contacting Dolby Support](#)



Note: Before you begin, follow the instructions in [Chapter 2](#) to install your CP950 in a Dolby® Digital Cinema network.

3.1 Connecting to the CP950

After you install the CP950 (as described in [Chapter 2](#)), connect your computer to the CP950:

1. Connect your computer to the auditorium network switch.
2. Open the web browser on your computer. Currently, the CP950 is compatible with Google™ Chrome™ v71.x or later. You can use other browsers, but you may experience user-interface issues in the CP950 the web client.
3. Connect to the CP950 by typing its IP address in your web browser.

An **authenticate** log-in screen appears, requesting a user name and password, as shown in [Figure 3-1](#). The default administrator user name and password are both `admin`. If you are a system administrator, you should change the administrator password, and then set up user access levels and passwords for all other users, as described in [Section 3.7](#).

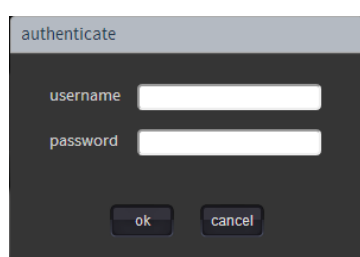


Figure 3-1 Authenticate Login Screen

After you log in, the CP950 web client **status** screen appears.

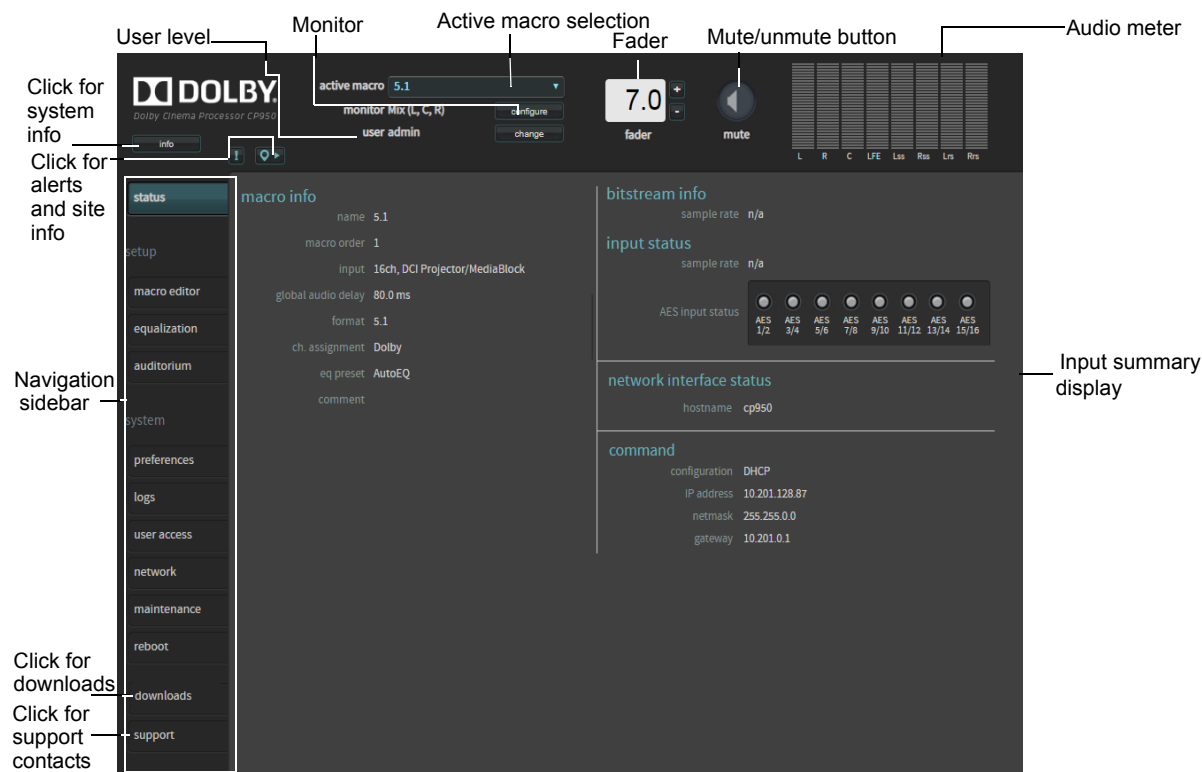


Figure 3-2 CP950 Web Client Status Screen

Following is a description of the recurring objects that appear in all of the web client user-interface screens.

3.1.1 Navigation Sidebar

The CP950 navigation bar provides access to the CP950 **status**, **setup**, and **system** screens. In addition, you can access **downloads** and **support** information. Click the desired menu option to display the corresponding screen.

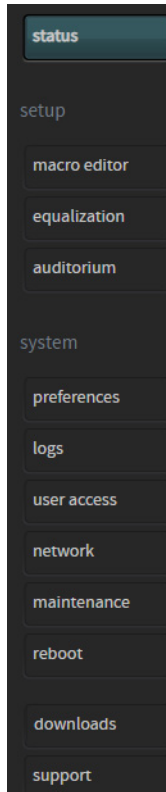


Figure 3-3 Navigation Bar

3.1.2 Active Macro Field

In this field, you can select the desired macro to use for your input source. The CP950 requires macros to process audio. You can use the default macros that are provided with the system, or you can create your own macros. For more information, see [Section 3.2](#).

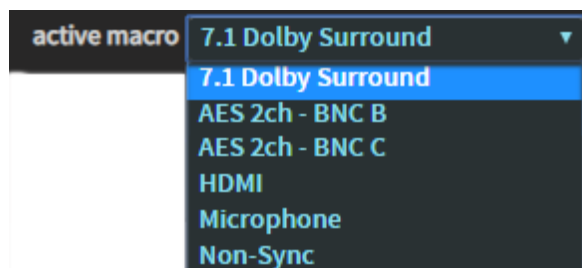


Figure 3-4 Active Macro Menu

3.1.3 Monitor Field

Click the **configure** button next to this field to select and monitor a mix of the Left, Center, and Right speaker feeds, any individual speaker feed, or an AES input when the 16-channel input is active.

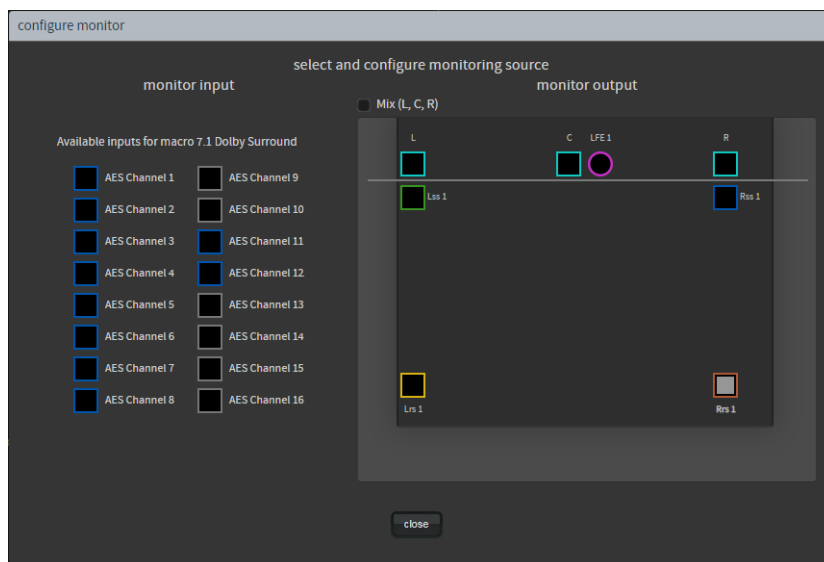


Figure 3-5 Configure Monitor Menu

If you change to a macro that does not use an AES 16-channel input, the system defaults to Left, Center, and Right, and you can select a speaker to monitor. If you select the Center speaker and you change the current macro with the Center speaker selected, the system defaults to the Center speaker.

3.1.4 Fader Field

Increase or decrease the volume by clicking the + or – buttons or by entering the desired value in this field.

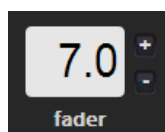


Figure 3-6 Fader Field

3.1.5 Mute Button

Click this button to mute and unmute the system.

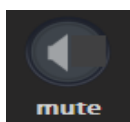


Figure 3-7 Mute Button

3.1.6 Audio Meter

This meter shows the signal intensity of the CP950 outputs.

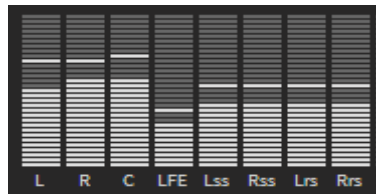


Figure 3-8 Audio Output Meter

3.1.7 Alerts

When the system sends an alert, the alert icon changes to a blinking yellow icon, as shown in the following figure.

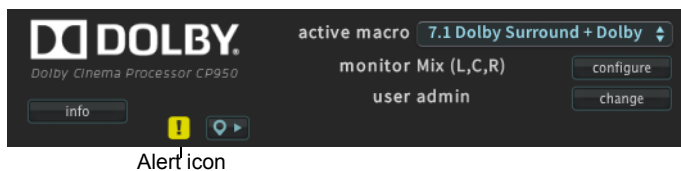


Figure 3-9 Alert Icon Indicating an Alert

To view an alert, click the alert icon. The alert message appears in the **messages and alerts** screen, as shown in this example.

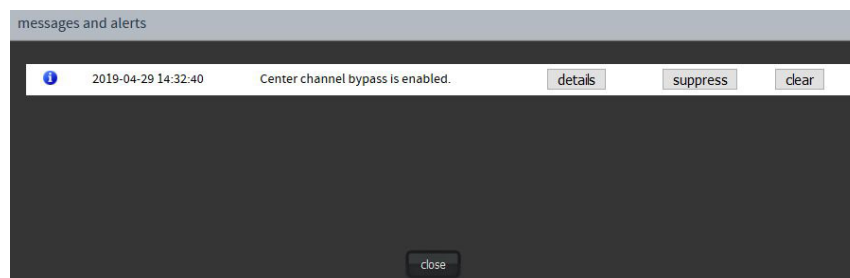


Figure 3-10 Alert Message (Center Channel Bypass Enabled)

You can stop this type of alert from blinking by selecting it and then clicking the **suppress** button. You can still view the alert in the messages and alerts pop-up window.

You can remove the displayed alert by selecting it and then clicking the **clear** button. The alert disappears from the **messages and alerts** screen and cannot be recalled until the system is rebooted (if the alert condition continues).

You cannot remove or suppress a temperature alert. A temperature alert disappears when the temperature returns to normal.

The CP950 now supports detailed alerts, which provide additional information and troubleshooting steps to help you resolve problems faster. Clicking on **details** opens a new screen in your web browser and displays the alert information. If replacement parts are needed, the **details** screen provides part numbers and Dolby ordering information. For power supply fuse-related alerts, the **details** screen shows you what to source locally.

3.1.8 Site Information and Location

To display the CP950 chassis serial number, IP address, and other information for your unit, click the site information button, which is located next to the alert icon at the upper-left side of the screen. This pop-up information enables a remote user to quickly view information regarding the unit and screen.

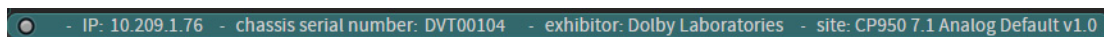


Figure 3-11 Site Information Pop-up

3.1.9 User

This field displays the current user level. If you have the necessary credentials, you can click the **change** button, enter your user name and password, and change the current user level. For more information on user levels, see [Section 3.7](#).

3.1.10 Info

To view system information, click the **info** button at the upper-left corner of the screen to display the **CP950 information** pop-up list.

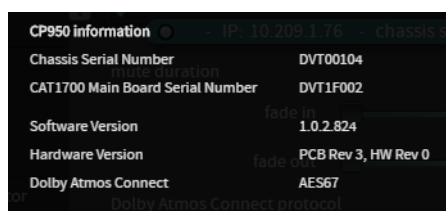


Figure 3-12 CP950 Information

3.2 Configuring Macros

The CP950 requires macros to process audio. The system provides you with these default macros that you can use, edit, or discard.

- **5.1:** Processes a 5.1 signal from a digital cinema playback system through the 8 × AES input.
- **7.1 Dolby Surround:** Processes a 7.1 signal from a digital cinema playback system through the 8 × AES input.
- **AES 2ch – BNC B:** Processes a coded input signal through the 1 × AES IN B connector. Supports Dolby Digital, Dolby Digital Plus, Dolby E, and PCM.
- **AES 2ch – BNC C:** Processes a coded input signal through the 1 × AES IN C connector. Supports Dolby Digital, Dolby Digital Plus, Dolby E, and PCM.
- **HDMI:** Accepts audio from an HDMI source. Supports PCM, Dolby Digital, Dolby Digital Plus, or True HD. If the system detects a video signal on the **HDMI IN** connector, it can repeat it on the **HDMI OUT** connector.
- **Microphone:** For public address/announcements. The system can process the microphone output from the center or surround speakers. For best results, reduce latency as much as possible.
- **Non-Sync:** Accepts left and right analog signals. You can add surround processing (upmixing) for analog signals to 5.0 or 7.0, and turn on **derive LFE**, to change these signals to 5.1 or 7.1.

In addition, you can create macros from scratch by selecting **macro editor** in the **setup** menu. You can configure macros and assign the order in which they are displayed in the front-panel user interface (FPUI).

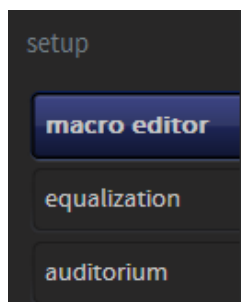


Figure 3-13 Select Macro Editor in Setup Menu

The **macro editor** screen appears, as shown in the following figure. In this screen, you can create or edit a macro by clicking **+** or **edit**, respectively, and entering the desired parameters.

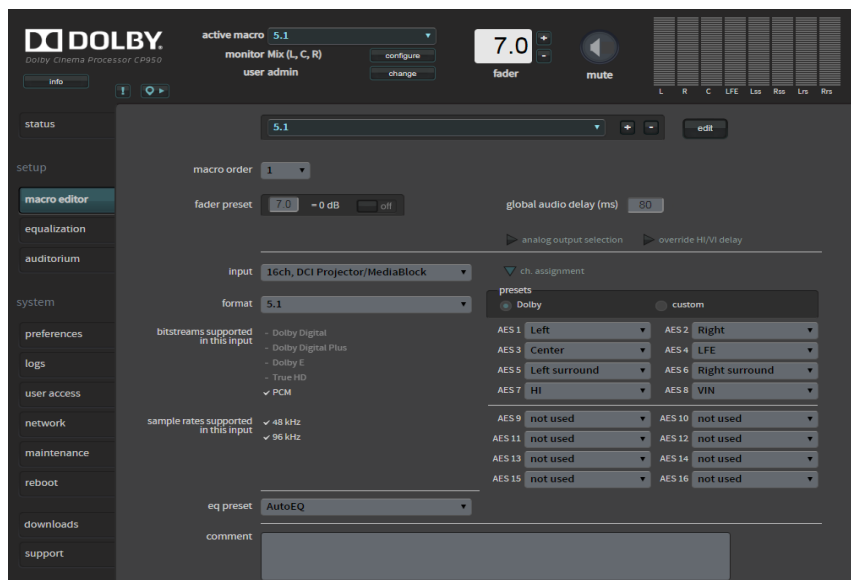


Figure 3-14 Macro Editor Screen

When using the **8x AES INPUT** input, there are two input options.

1. When connecting to a digital cinema media block (IMS, IMB, or external) use the **16ch, DCI Projector/MediaBlock** input option. This option processes audio correctly for such a device.
2. In cases where you are not using a digital cinema source or if you are transmitting coded audio to AES pair 1/2, use the **16ch. AES Digital** input option for best results.

Figure 3-16 shows the parameters in the **macro editor** screen for a **16ch, DCI Projector/MediaBlock** input source, while **Figure 3-17** shows parameters for a **16ch. AES Digital** input source. These examples show how the parameters change for these two inputs and how the screen changes when you click the **ch. assignment** or the **surround processing** tab. Note that the **surround processing** tab is available only for consumer encoded audio (for example, Dolby Digital).

Using surround processing, you can specify that the system upmixes an input signal with a low channel count into a multichannel surround signal and indicate how the system processes different signals. The available parameters can also change when selecting other input sources.

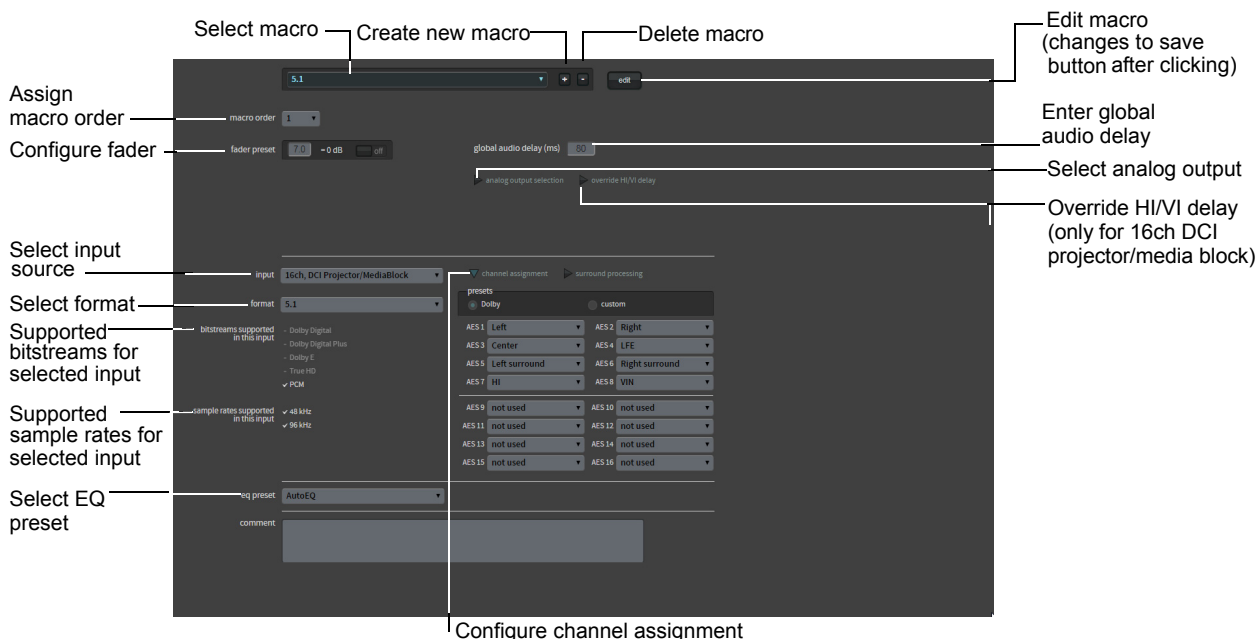


Figure 3-15 Configure Macro Channel Assignment

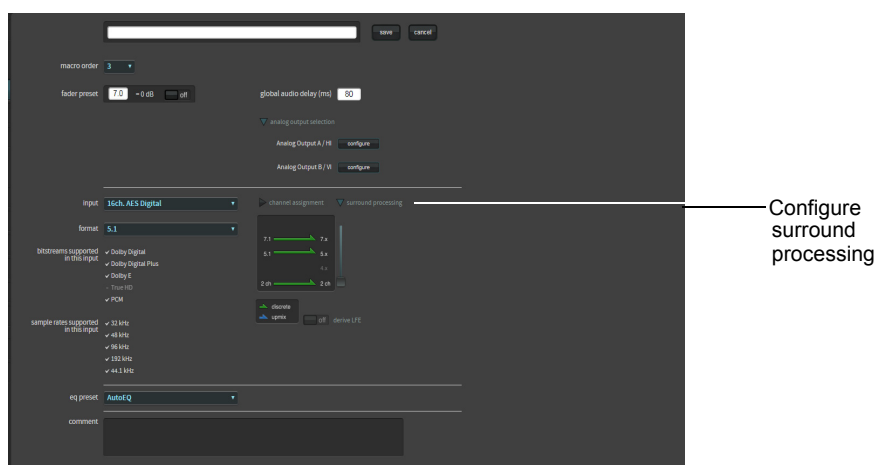





Figure 3-16 Configure Macro Surround Processing and Upmixing

Create or Edit a Macro

1. Click the  button to create a new macro or the **edit**  button to edit an existing macro.



If you click either of these buttons, the parameter fields become active and you can enter the desired settings. In addition, the **edit** button changes to a **save** button, and a **cancel** button appears . The **cancel** button allows you to cancel your entries.

2. Configure the desired parameters in the **macro editor** screen.

Following is a description of all the parameters in the **macro editor** screen. The available parameters can change, based on your input source. After configuring all of the parameters, click the **save** button.

Macro Selection

Click in this field to select the macro that you want to edit.

If you click the  or  button, you can create a new macro, or edit a macro.

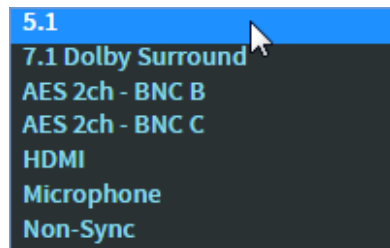



Figure 3-17 Select Macro to Configure

Delete Macro

Click the  button to delete the selected macro.

Macro Order

Click in this field to assign a macro number for your macro. Your selection appears in numerical order for the macros displayed on the front-panel user interface.

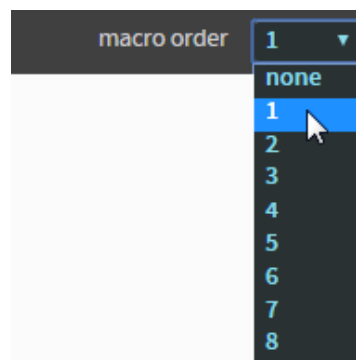


Figure 3-18 Select Macro Order

Fader Preset

Click in this field to enter a default fader value for your macro. When enabled, the system uses this value when you (or automation) select the macro. Click the **on/off** button to enable or disable this function.

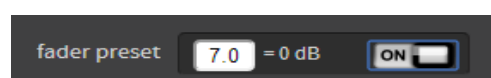


Figure 3-19 Enter Fader Preset

Global Audio Delay (ms)

Click in this field to enter a global audio delay (in milliseconds) for your macro. In some cases, you may need to change the audio delay in the media block when using a 16-channel input. The minimum global audio delay for digital cinema content is 25 milliseconds, and the maximum is 1,000 milliseconds. (For details, refer to the media-block setup instructions in your *Dolby Digital Cinema System Manual*.) If you enter a delay that is not in the range for your selected input, red text appears next to this field, indicating the required range for the delay, as shown in the following figure.

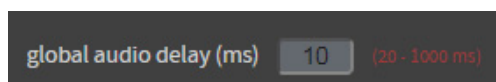


Figure 3-20 Enter Global Audio Delay

Analog Output Selection

Click this tab to activate the **configure** buttons for the **HI** and **VI** analog outputs. If these analog outputs are not used to provide audio to an accessibility system, you can repurpose them for other functions.

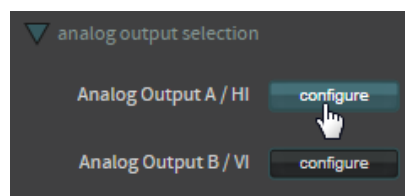


Figure 3-21 Activate Analog Output Configuration

When you click a **configure** button, you can configure the source that the system routes to the hearing impaired (**HI**) or visually impaired (**VI**) analog output connectors on the CP950 rear panel. You can configure the output for any speaker feed (or LCR mix) by clicking in the desired box.

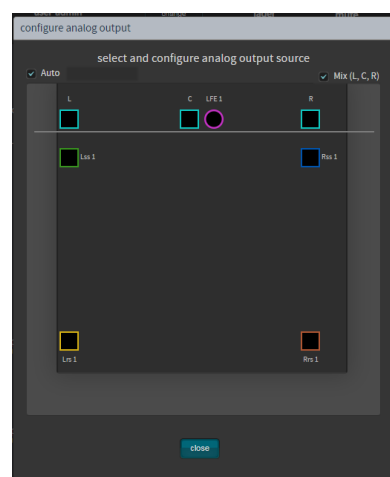


Figure 3-22 Configure Analog Output

Override HI/VI Delay

This parameter appears when you select **16ch, DCI Projector/Media Block** as the **input** for your macro. Click this tab to independently control the timing of the hearing impaired and visually impaired narration. This is useful for the hearing impaired timing so that it matches the main audio in the auditorium, or more precisely controls the visually impaired audio so that it does not interfere with dialogue from the main audio. The system applies the resulting values to the **HI** and **VI** analog outputs.

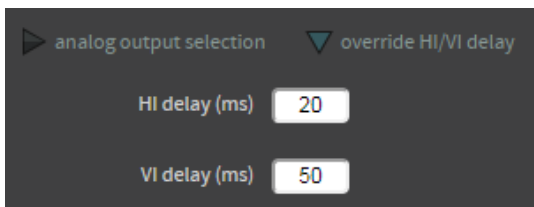


Figure 3-23 Override HI/VI Delay

Input

Click in this field to select the desired input source.

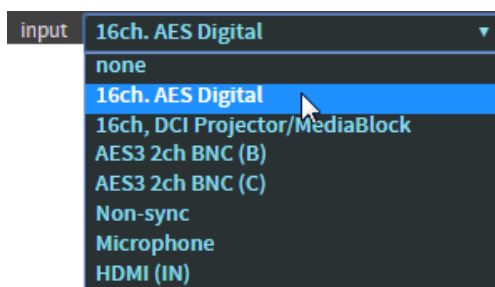


Figure 3-24 Select Input Source

When using the **8x AES INPUT** input, there are two input options:

1. When connecting to a digital cinema media block (IMS, IMB, or external) use the **16ch, DCI Projector/MediaBlock** input option. This option processes audio correctly, for such a device.
2. In cases where you are not using a digital cinema source or if you are transmitting coded audio to AES pair 1/2, use the **16ch. AES Digital** input option for best results.

Format

This parameter appears for 16-channel inputs, where you can click in this field to select the desired audio format. Typical presets (for example, 5.1 and 7.1) are defined by default. You can customize your audio format by selecting **custom**. (See **Channel Assignment** in the next section.)

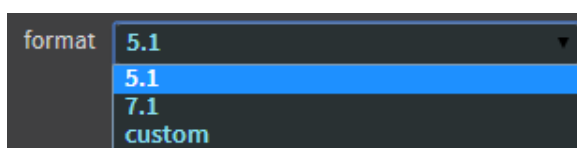


Figure 3-25 Select Audio Format

Channel Assignment

For 16-channel inputs, click the **ch. assignment** tab to view the **Dolby** channel assignment presets.



Note: The CP950 actively monitors any AES3 channels that are required for macros and sends alerts if the system detects that one or more channels is intermittent or disconnected. If you are using Dolby Fidelio or another accessibility system that removes channels 7 and 8, you must edit your 5.1 and 7.1 Dolby Surround macros to prevent false alerting. To edit these macros, change from the **Dolby** preset to the **custom** preset, and then change channels 7 and 8 to **not used**.

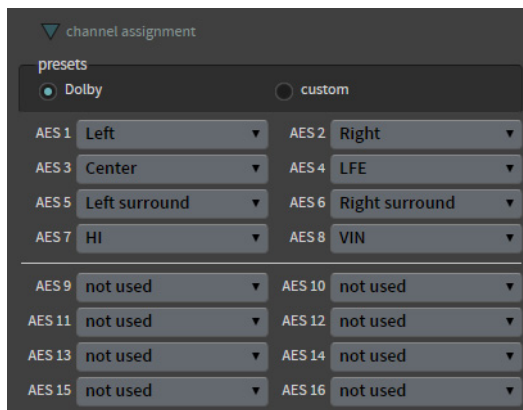


Figure 3-26 Dolby Preset Channel Assignments

To change the **Dolby** presets, click on the **custom** button, and then click in the respective fields to select the desired channel assignments.

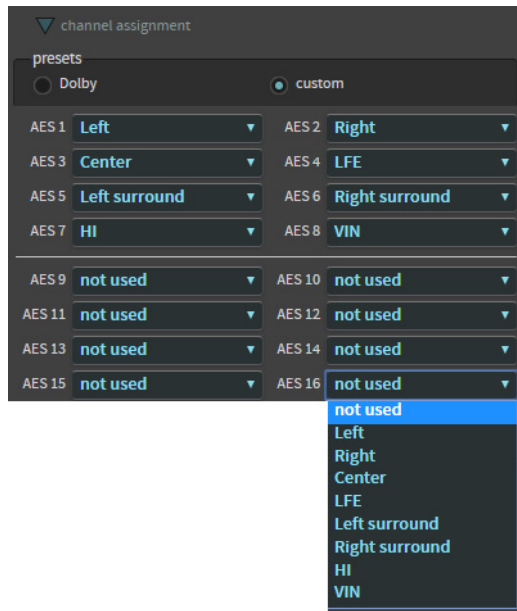


Figure 3-27 Customize Channel Assignments

Surround Processing

The CP950 can upmix incoming signals with low channel counts into surround output signals. Click the **surround processing** tab to configure this parameter (available for non-sync and consumer encoded audio only) by moving the slider to the desired position. You cannot upmix digital cinema content by moving the slider.

The figure below shows the parameters for the **Non-sync** input where the system processes two-channel input into a 5.x signal. You can enable/disable subwoofer signal processing by clicking the **derive LFE** button, which toggles the signal between 5.1 (enabled) and 5.0 (disabled).

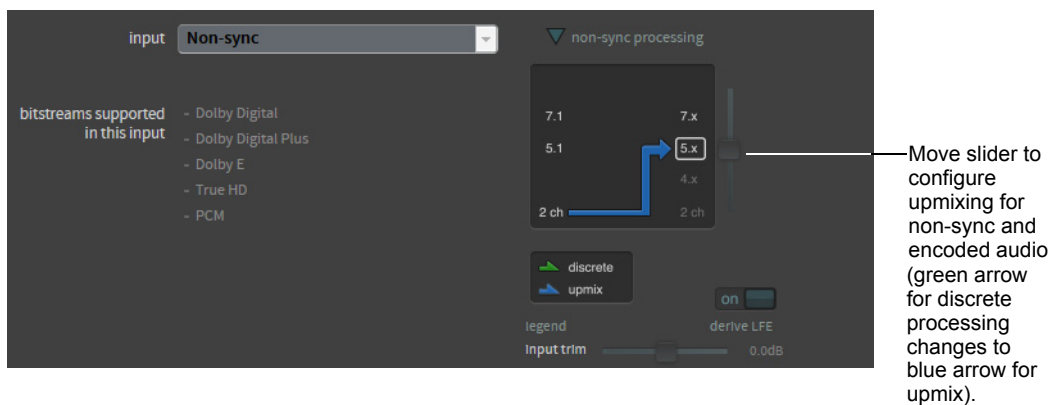


Figure 3-28 Surround Processing Parameters (Non-Sync Input)

For the **Microphone** macro, you can specify that audio is transmitted from the center or surrounds. You can also enable/disable phantom power (+48 V).

EQ Preset

Click on this field to select the equalization preset parameters you want to use for your macro. These parameters are either the automated equalization (**AutoEQ**) settings or custom settings that you can create, as described in [Section 3.3](#).

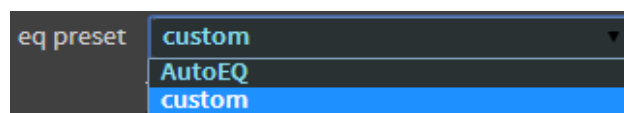


Figure 3-29 Select an EQ Preset

3.3 Displaying the Equalization Screen

The **equalization** screen enables you to change the auditorium sound field. You can do this as a stand-alone operation in the CP950 web client, or in conjunction with Dolby Atmos Designer (DAD) version 3.2 or later. DAD is a separate application that allows advanced users to configure speakers, crossovers, outputs, amplifiers, and so on. You can download the current version of DAD software, release notes, and manual at www.dolbycustomer.com. You can also access the manual and release notes from the DAD software **Help** menu.

This section provides an overview of the **equalization** screen. For detailed instructions on configuring equalization and calibrating sound, see [Chapter 4](#) in this manual.

To run equalization in the web client, select **equalization** in the **setup** menu.

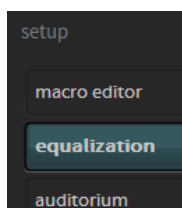


Figure 3-30 Select Equalization in Setup Menu

The real-time analyzer EQ display appears in the **equalization** screen.



Figure 3-31 Displaying and Configuring the Real-Time Analyzer EQ Display

In this screen, you can equalize the auditorium by starting a new EQ preset, and then use the standard one-third octave EQ (similar to CP750 EQ) or the **Grossman eq**, which allows you to zoom in and make finer adjustments.

For more detailed descriptions, see the sections that follow.



Note: You cannot edit the AutoEQ preset parameters. However, you can save a copy of these parameters under a different name and make changes to the copy.

3.3.1 Adding an Equalization Preset

To begin, the system defaults to the **AutoEQ** preset. This equalization preset is blank until you run AutoEQ for the CP950 from DAD. You can change this preset only by running AutoEQ. To configure the CP950 manually (or if you need to edit the AutoEQ parameters), you must create a copy of the **AutoEQ** preset, which is editable. In addition, you can create a new equalization preset.

To add a new equalization preset:

1. Click the  button.

You are prompted to base your new preset on either the **AutoEQ** preset or a copy of a previously created customized preset. In either case, you must also enter a name for your new preset. Alternatively, you can create a new customized preset by following the instructions in [Section 3.3.2](#).

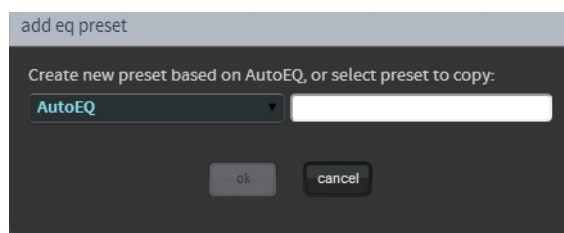




Figure 3-32 Add an EQ Preset

2. Enter a name for your new preset, then click the **ok** button to save your new preset.
3. Click the activated **edit**  button. The **edit** button changes to a **save** button, and a **cancel** button appears, which allows you to cancel your entries.

The equalization parameters are now activated for editing, as shown in [Figure 3-35](#).

4. Configure the desired parameters in the **equalization** screen.

After configuring all of the desired parameters, click the **save** button to create your new preset.

You can delete a customized preset by clicking the  button. You cannot delete the **AutoEQ** preset.

3.3.2 Loading or Editing an Equalization Preset

To load an existing preset:

1. Select the desired preset in the EQ presets menu.

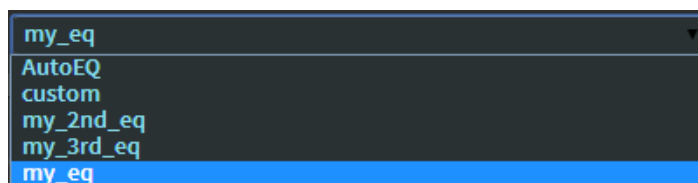


Figure 3-33 Load an EQ Preset

You can use the loaded preset for equalization, or you can edit the parameters for one of your customized presets, as described next.

If you want to edit one of your customized presets, click the **edit** button. (The **custom** preset option in the EQ presets menu is based on the **AutoEQ** preset parameters.) You cannot edit the **AutoEQ** preset unless you save it under a different name.

After clicking the **edit** button, a warning message appears.

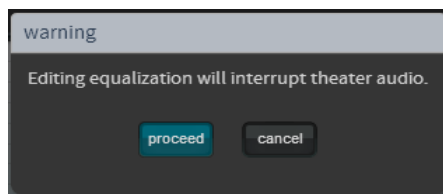


Figure 3-34 Editing Equalization Warning Message

2. Click **proceed** to edit your preset.

The **edit** button changes to a **save** button, and a **cancel** button appears, which allows you to cancel your entries.

The equalization parameters are now activated for editing, as shown in [Figure 3-35](#).

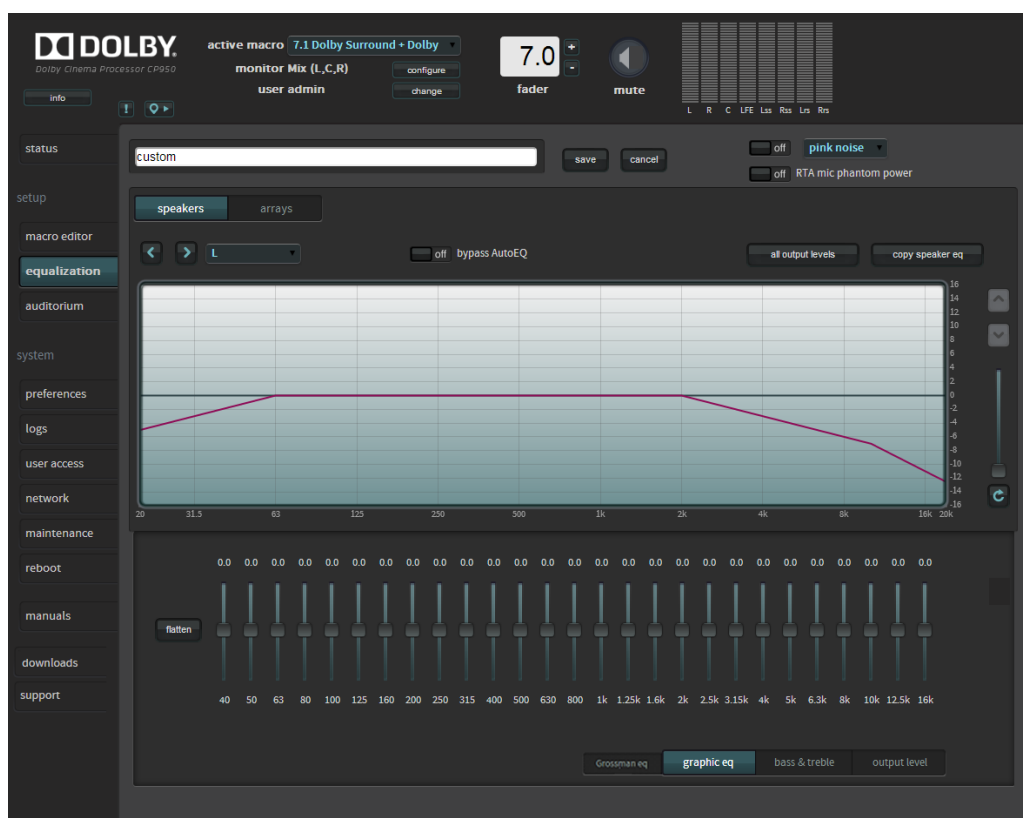



Figure 3-35 Equalization Parameters Activated for Editing

3. Configure the desired parameters in the **equalization** screen.
4. After configuring all of the desired parameters, click the **save** button to finalize your changes to the existing preset.

You can delete a customized preset by clicking the  button. You cannot delete the **AutoEQ** preset.

3.3.3 Equalization Parameters

Following is a detailed description of all the parameters that appear in the **equalization** screen. You can configure these parameters for customized presets when you click the **edit** button.

Test-Signal Generator and Microphone Phantom Power

The CP950 provides a test-signal generator to play out different audio test files that are used for calibrating a cinema audio system. You can select a test signal from the drop-down menu. Click the respective **on/off** button to turn the selected signal on and off.

You can select an option from the test-signal generator drop-down menu.

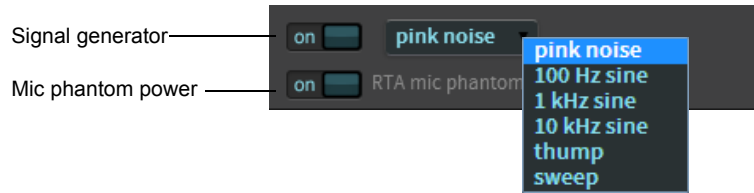


Figure 3-36 Real-Time Analyzer Test-Signal Generator and Microphone Phantom Power

The default output level for pink noise, thump, and sine signal tones, is -30 dBFS. The default output level for the sweep signal tone is -40 dBFS.

All of the sine wave and thump settings play back at a level of -20 dBFS, and the sweep signal plays back at -30 dBFS.

Pink noise is slightly different, as it is configured via SMPTE standard ST2095-1:2015 Section 6.2, which states that the level should be -33.74 dBFS.

Speakers and Arrays Feeds

Select **speakers** or **arrays**, then click in this field to select the respective output. You can view the EQ for each output or make changes. To move between outputs, select from the drop-down menu or use the arrow buttons to scroll through the list. Currently, the CP950 does not require entries into the **arrays** sections of the web client.

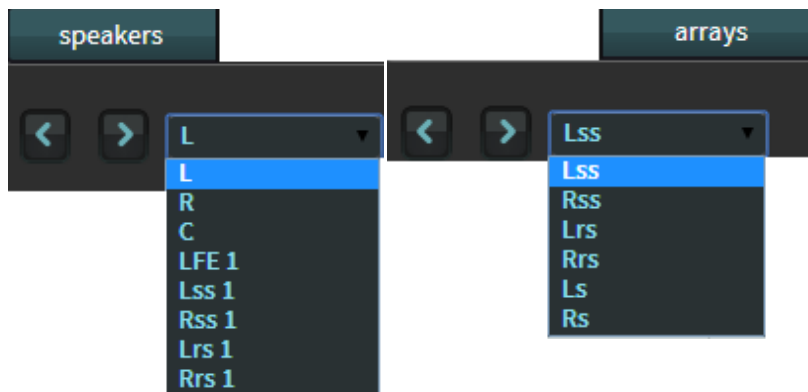


Figure 3-37 Speaker and Arrays Feeds

Bypass AutoEQ

This parameter specifies that the system will bypass the AutoEQ parameters and use the specified custom preset. You can click on the **on/off** button to enable or disable this parameter.

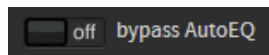


Figure 3-38 Bypass AutoEQ



Note: When you select **on**, the system bypasses AutoEQ only for the speaker you are currently editing (as specified in the speaker feeds drop-down menu, as shown in [Figure 3-37](#)).

All Output Levels

Click this button to display and adjust the output levels for each speaker or array in your preset. Select an individual speaker or array by clicking on it, or press and hold <Ctrl> (or <Command> for a Mac®) on your keyboard to make multiple selections. To change output levels, move the slider with the mouse or the up/down arrow keys. In addition, you can test with content or generate test signals in this screen. Click **ok** to confirm your entries.

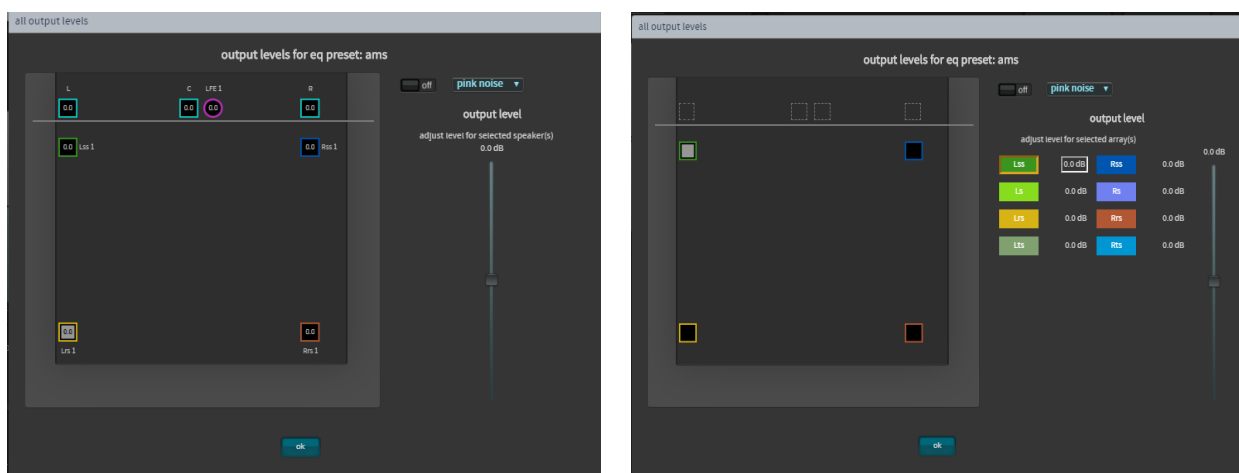


Figure 3-39 All Output Levels Screen (Speakers and Arrays)

Copy Speaker EQ

Click this button to copy manual speaker EQ settings from one source to one or more destinations. When you click on a source and then click on a destination, the **copy** button is activated, and you can click on this button to confirm the location.

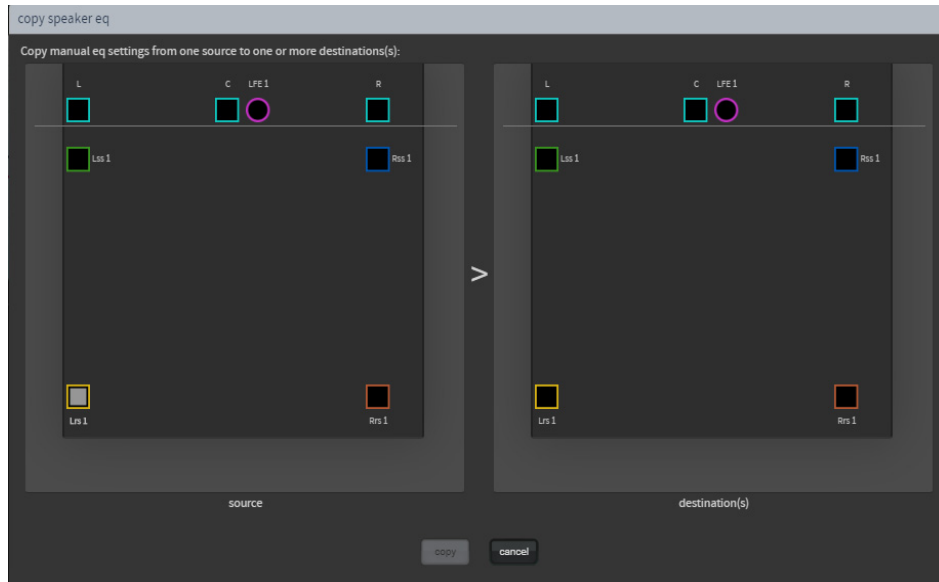


Figure 3-40 Manual Speaker EQ

Real-Time Analyzer EQ Display Slider

Drag the slider or click the up and down arrow buttons (shown in the following figure) to zoom in on areas of the real-time analyzer EQ display.



Figure 3-41 Real-Time Analyzer EQ Display Slider

Graphic Equalizer

Click on the **graphic eq** button, and drag each slider to adjust the gain throughout the range of frequencies, as shown on the real-time analyzer EQ display. This is the standard one-third octave EQ. Click the **flatten** button to flatten the curve.

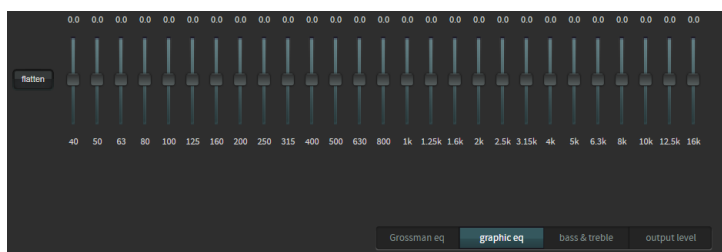


Figure 3-42 Graphic Equalizer

Bass and Treble

Click on the **bass & treble** button, drag the corresponding sliders, and change settings to adjust each parameter, as shown on the real-time analyzer EQ display. Click the **flatten** button to flatten the curve.

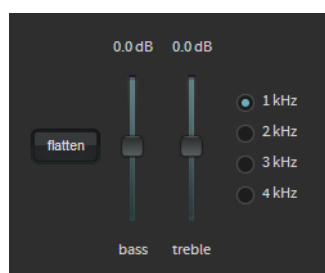


Figure 3-43 Bass and Treble

Output Level

Click on the **output level** button, and drag the corresponding slider to adjust the output level. Click the **flatten** button to flatten the output level.

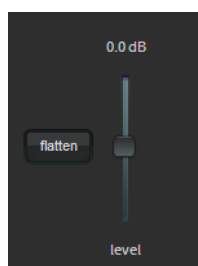


Figure 3-44 Output Level

3.3.4 Grossman eq

Grossman eq is an equalization (EQ) tool that enables finer room tunings. It is provided for technician- or admin-level users. As you zoom in on the display, it allows you to control narrowband EQ. This tool displays an interface that provides users with the ability to utilize the one-twelfth octave capabilities of the CP950, CP850, and IMS3000 equalizers. The existing bass, treble, and one-third octave controls provide broadband equalization at fixed frequencies that limit equalization flexibility. Grossman eq provides controls that allow users to narrowly or broadly adjust the frequency response at any point from 20 Hz to 20 kHz.

When you click **equalization** in the navigation bar, and then click the **edit** button to edit equalization for one of your custom presets, a **Grossman eq** button appears in the equalization screen (to the left of the **graphics eq** button), as shown in the following figures.



Figure 3-45 Grossman eq Button

When you click the **Grossman eq** button, the Grossman eq screen appears. The example in the following figure shows a graph that displays a Grossman eq frequency curve (in green) that a user can create by utilizing the specialized Grossman eq tools that are shown in the figure (and described in the following sections). In addition, the graph displays the resulting sum of all input to the eq curve (in black), which includes auto eq, Grossman eq, graphic eq, bass and treble, and output level. The x-curve is displayed in red (as it is in the other equalization screens).



Figure 3-46 Grossman EQ Screen

Following is a description of the controls in the **Grossman eq** screen, as shown in the previous figure.

Grossman Equalizer Sliders

You can drag each of these sliders to adjust the gain throughout the range of frequencies shown on the graph. The number above each of these sliders represents the position of the slider from -10 dB gain to $+10$ dB gain. This corresponds with the center band of all bands that the slider represents. The number below each of these sliders denotes the frequency (Hz) of the center band of all bands represented by that slider.

Horizontal Slider

The horizontal zoom slider affects the number of one-twelfth octave EQ bands that you control with the Grossman equalizer sliders. When you move a slider slowly to the right, the number of bands decreases by 1. At its left-most position, the slider corresponds to 15 bands per slider, and at its right-most position, it corresponds to one band per slider. Note that each slider may affect more than this precise number of bands, due to smoothing of the EQ curve. You can zoom in and out to keep the center band of the graph constant as far as possible. (It must also adjust for either end of the graph while zooming out.)

Panning affects which bands the sliders manipulate. You can also pan around (when not fully zoomed out) by dragging the graph left and right, or by using the arrow buttons next to the slider. The arrow buttons move the graph left or right one band at a time.

The refresh button resets the zoom slider back to 15 bands per slider.

Replace and Add Buttons

These buttons denote two modes of operation. When you click **replace** and move an equalizer slider to a different position to change a setting, this replaces the Grossman band gains (the green plot only) with the new setting. When you click **add** and move a slider to a different position, this adds the new changes to the existing Grossman band gains. Note that in add mode, it is possible to set band gains beyond the range of the sliders, that is, beyond the $[-10$ dB, $+10$ dB] range. In such a case, the Grossman band gains (only the green plot) are saturated at $+10$ dB or -10 dB. Grossman eq remembers the shape of the curve before it was saturated, so if you reduce the level (which desaturates), the original shape is retained.

Flatten Button

When you click **flatten**, Grossman eq sets all of the visible bands to 0 dB gain by flattening only the area of the EQ range that is currently visible on the graph, based on the zoom slider setting.

Grossman eq Results

After using the above controls, be sure to click **save** at the top of the screen to retain your changes (or **cancel** to discard your changes). After saving your settings, the main **equalization** screen should now display the resulting 20 Hz to 20 kHz curve (without the markup of the Grossman eq contribution).

3.4 Displaying the Auditorium Parameters

To display the auditorium configuration summary and routing information:

1. Select **auditorium** in the **setup** menu.

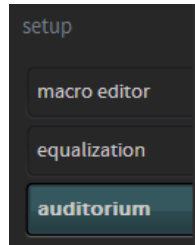



Figure 3-47 Select Auditorium in Setup Menu

The **auditorium** screen appears. In room view (under the **summary** tab), the speakers are displayed according to their x and y coordinates with the corresponding configuration summary. Figure 3-48 shows a configuration with no crossovers, and Figure 3-49 shows a different configuration that includes two crossovers (designated by  icons).

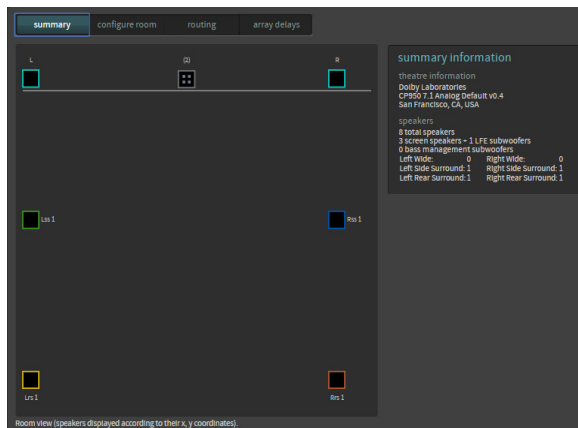


Figure 3-48 Auditorium Configuration Display (Room View)

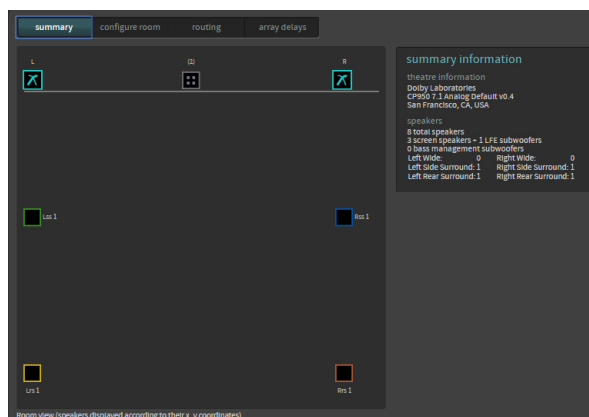


Figure 3-49 Auditorium Configuration Display (Room View with Crossovers)

When you hover your mouse on any of the solid-colored icons, this information appears: channel name, position, array (if assigned to an array), routing, speaker data (if populated), and bass management assignment (indicating the speaker that is bass managed) if bass management is applied.

If you have multiple speaker feeds with the same positional data, an icon with four small squares appears. When you click on this icon, it indicates the speakers that share this positional data.

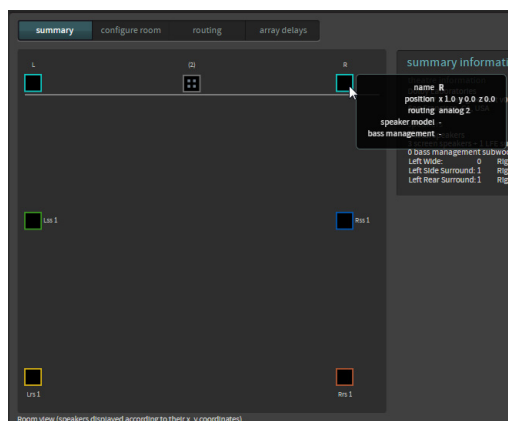


Figure 3-50 Hover Mouse to Display Additional Information

3.4.1 Configuring a Room

When you click the **configure room** tab, you can select the room size and surround delay. To configure an auditorium without Dolby Atmos Designer (DAD), click in the **room configuration** field to display a drop-down menu and select the appropriate room configuration, then use the distance fields to enter the appropriate distances so the system can calculate the surround delays.

When using DAD, you cannot make entries in the distance fields. Once you upload a room configuration from DAD, you can select **Dolby Atmos Designer** for the **room configuration** from the drop-down menu.

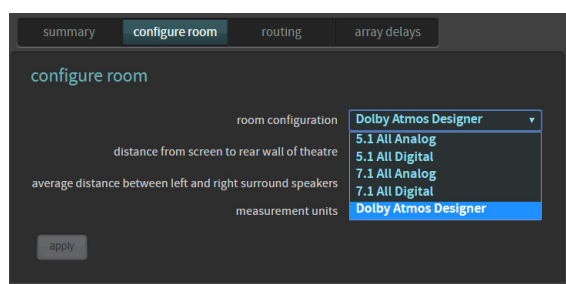


Figure 3-51 Configure Room Screen

For complete details on configuring a room, see [Chapter 4](#) in this manual.

3.4.2 Displaying the Routing Configuration

To view the routing configuration, click the **routing** tab.

In this screen, the output routing channel is identified within each icon. If it is a digital output, the routing icon is a square. If it is an analog output, the routing icon is a circle. The number inside each icon indicates the output channel number assigned to that speaker position.

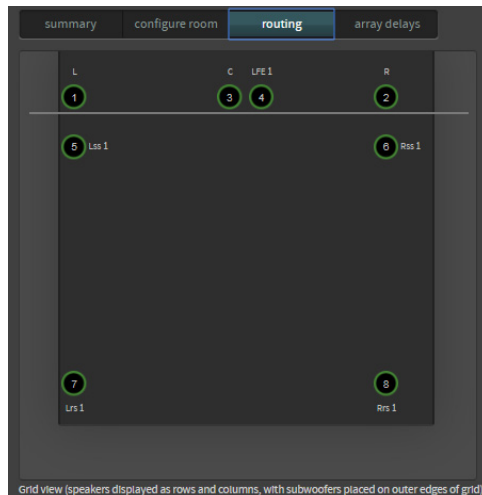


Figure 3-52 Routing Configuration

When you hover your mouse on any of the icons, the following information appears:

- Channel name.
- Position in the room in x,y, z coordinates. The position shown is not critical for surround speakers in 5.1 or 7.1 rooms.
- Array (if assigned to an array).
- Routing.
- Speaker data (if populated using Dolby Atmos Designer).
- Bass management assignment (indicates which subwoofer receives low frequency audio for a speaker). This information appears only if bass management is applied in Dolby Atmos Designer.



Figure 3-53 Hover Mouse to Display Channel Information

3.4.3 Configuring the Array Delays

To configure the array delays, click the **array delays** tab.

The **surround speaker array delays** screen appears. The Dolby Atmos Designer software automatically creates the surround delay values. If you click (to place a check mark) in the **use configuration file values** box, the system uses the AutoEQ values. When this box is not checked, you can enter the desired delay values and then click the **apply** button.

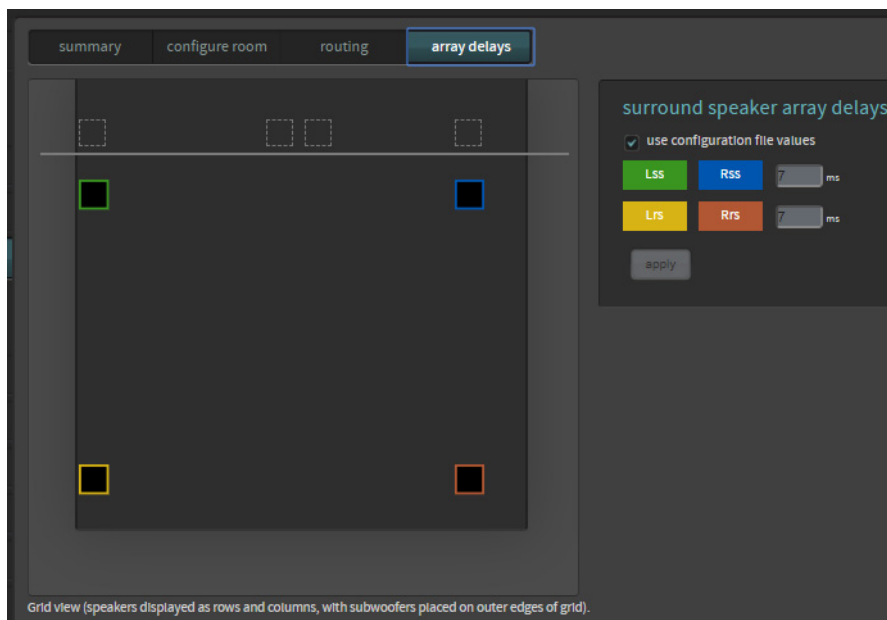


Figure 3-54 Surround Speaker Array Delays Screen

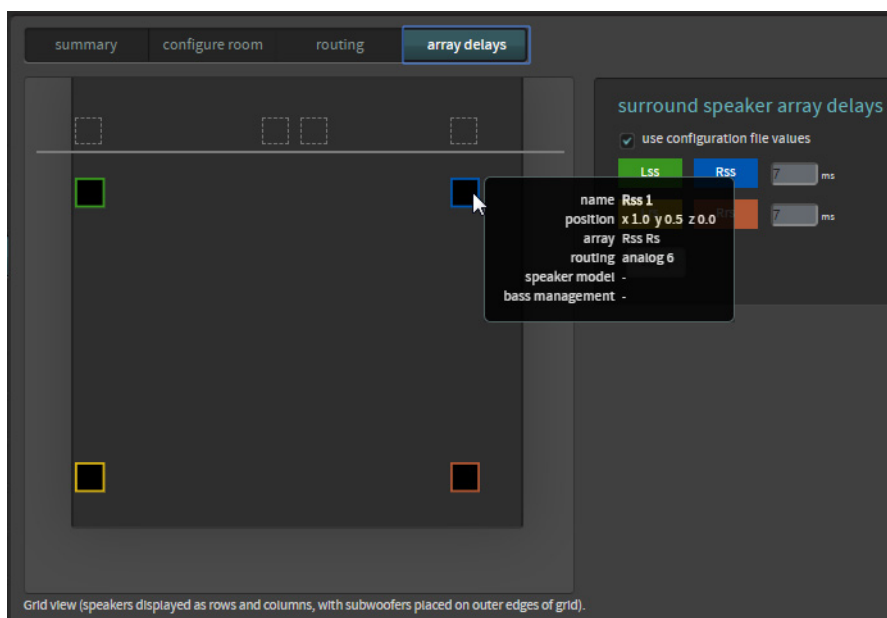


Figure 3-55 Hover Mouse to Display Additional Information

3.5 Configuring Preferences

To configure preferences, select **preferences** in the **system** menu.

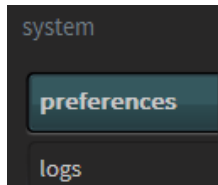


Figure 3-56 Select Preferences in System Menu

The **preferences** screen appears.

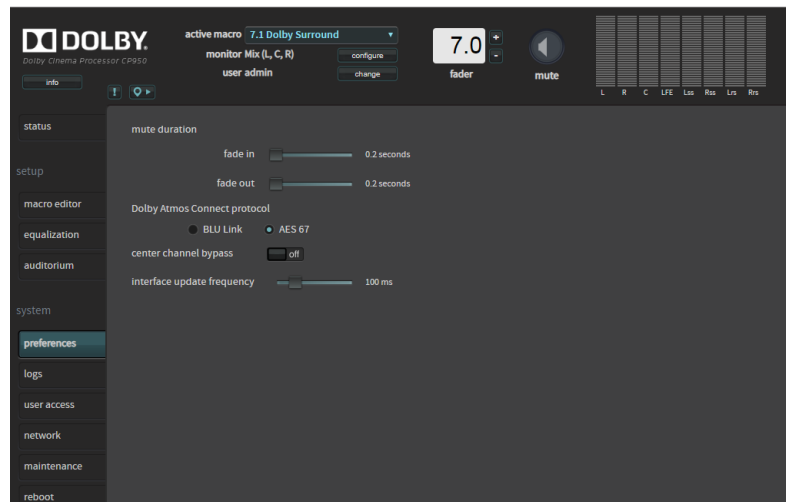


Figure 3-57 Preferences Screen

In this screen, you can:

1. Configure **mute duration** by entering the fade-in and fade-out values for the mute button or when switching macros. Each **fade in** and **fade out** setting has a range of 0.2 to 5 seconds, in 0.1-second increments. You can set these values by moving the respective sliders.
2. Select between **AES67** or **BLU Link** protocols for **Dolby Atmos Connect** digital outputs.
3. Enable or disable the **center channel bypass** if there is a problem with the center channel speaker. Enabling the bypass sends center channel audio to the left and right speakers. You can run in this mode until the center channel speaker problems are resolved.
4. Specify the **interface update frequency** by moving the corresponding slider. This setting allows you to indicate how many updates per second the web client user interface sends. If your network connection is slow, you can increase this value using the slider (range of 50 ms to 10,000 ms). Connecting to the CP950 (locally, or remotely through a network operation center [NOC]) results in a web client update at the specified frequency.



Note: The system takes several minutes to complete this operation and reboots when switching between AES67 and BLU Link.



Note: If you select **BLU Link**, you can use the **1x AES IN B** BNC input for a word clock if the word clock is present when you select the current macro and a valid 48 kHz word clock signal is present on that input. The word clock signal must be a square wave at 48 kHz, not an AES3 signal. If the system drops or interrupts the word clock for more than one period, internal clocking returns and the word clock does not resume until you reselect the macro with the word clock present. The system provides the word clock state in the logs, but not in the FPUI or web client.

3.6 Viewing and Downloading the System Logs

The logs display information regarding the CP950 system. You can view the logs by selecting **logs** in the **system** menu, or download the logs to review them offline or to send to your support team. The system may take several minutes to compile a complete set of logs.

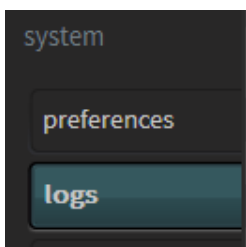


Figure 3-58 Select Logs in the System Menu

The **logs** screen appears. You can filter the logs by **level**, **category**, and **start time/end time** by clicking the respective area and making the desired selection, or by clicking **show all** to remove all filters. In addition, you can download the logs in a .tgz file by clicking **download** in the lower-right corner of the **logs** screen. At the root of the file is a report.txt file that contains basic system information. This single file provides helpful information on the versions, configuration, and CP950 status.

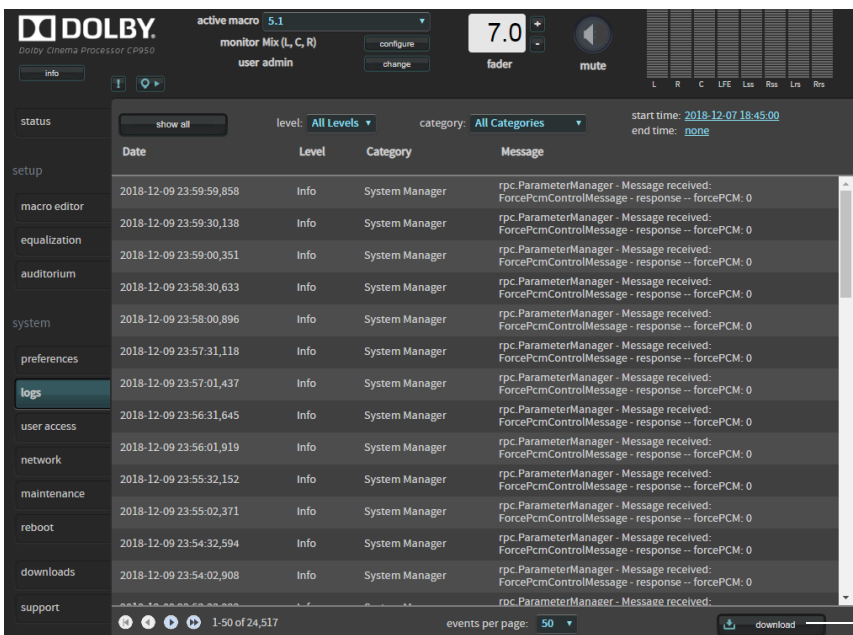


Figure 3-59 Event Logs Screen (All Levels, All Categories Selected)

When you click the **level** field, the corresponding drop-down menu appears, where you can select the user log display level, as shown in [Figure 3-60](#).

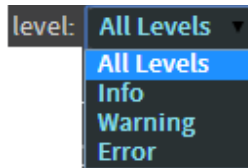


Figure 3-60 Level Menu

Info specifies the lowest level of severity.

Warning specifies medium severity.

Error specifies an alert of high importance.

Category

When you click the **category** field, the corresponding drop-down menu appears, where you can select a user log display category, as shown in [Figure 3-61](#). These items allow you to display events from a specific system component.

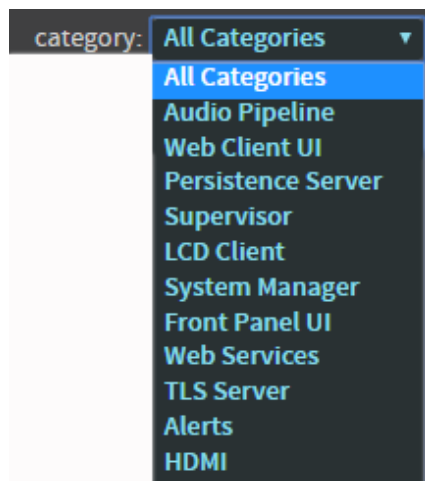


Figure 3-61 Category Menu

Start Time/End Time

When you click the **start time** or **end time** field, two options appear: **All** and **Custom**. **All** specifies a log for all time frames. **Custom** activates the date and time fields, where you can select a specific time frame. Click the ✓ to display the specified log. If you click the ✕, the system displays all time frames (same as **All**). However, when you download logs, the system does not use these time frames. All logs are downloaded, regardless of time frames.

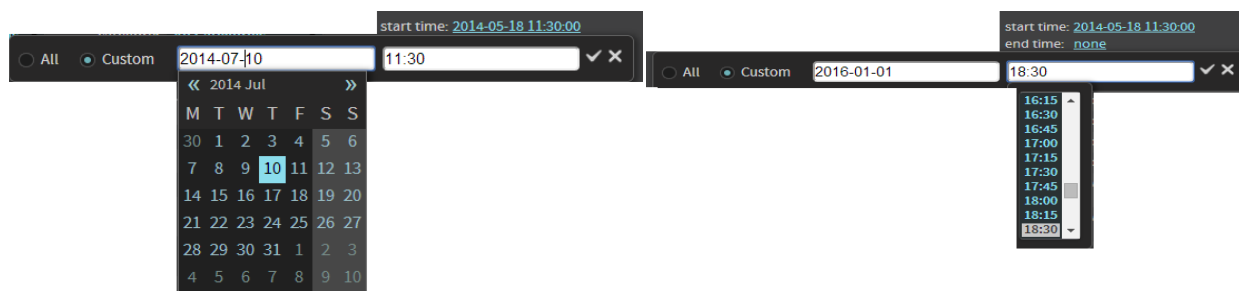


Figure 3-62 Start Time/End Time Fields

3.7 Setting up User Access

If you have administrator privileges, you can set up user access as follows:

1. Select **user access** in the **system** menu.

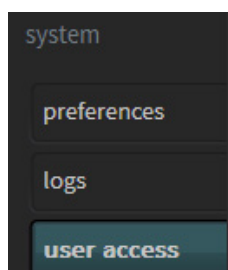


Figure 3-63 Select User Access

The **user access** screen appears. In this screen, if you are a system administrator, you can change (or reset) the default administrator password (*admin*) and set up (or reset) user access and passwords for all other users.

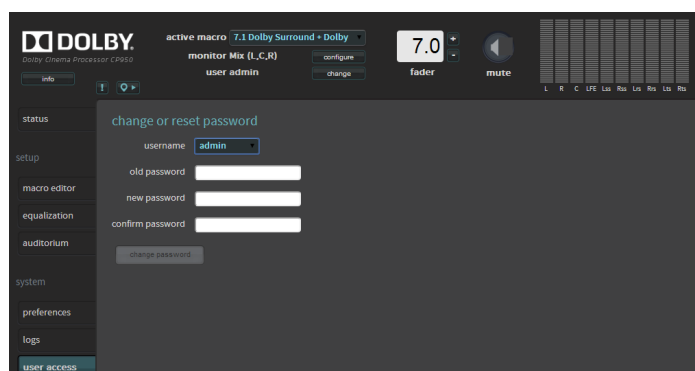


Figure 3-64 User Access Screen

2. Click the **username** field.
The **username** menu appears with a list of all user levels.

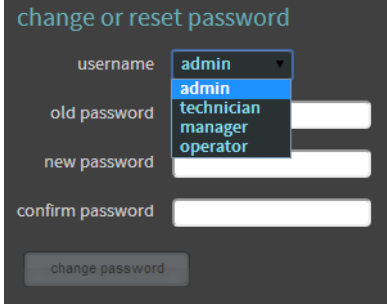
The image shows a web interface for changing or resetting a password. The title is "change or reset password". There are four input fields: "username", "old password", "new password", and "confirm password". The "username" field has a dropdown menu open, showing four options: "admin", "technician", "manager", and "operator". The "old password" field has a small white box to its right. Below the fields is a "change password" button.

Figure 3-65 User Name Menu

3. Select a user name, enter the old password, enter the new password, and then confirm the new password in the respective fields. The default passwords are the same as the user names.

These are the capabilities at each user level:

- **operator:** Access status screen, change macros, fader, and monitor selection. View auditorium configuration and event logs. Download event logs.
- **manager:** Access all operator-level tasks, and edit macros. Change the operator-level password.
- **technician:** Access all manager-level tasks. Perform manual equalization, change network settings, clear event logs, update system software, manage system settings, reboot system, change the operator- and manager-level passwords, and update the certificate.
- **admin:** Access all technician-level tasks, and change the operator-, manager-, and technician-level passwords.

3.8 Modifying the Network Settings

To modify the network settings, select **network** in the **system** menu.

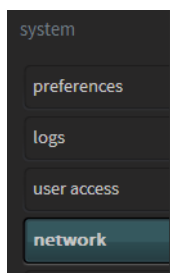


Figure 3-66 Select Network in the System Menu

The **network** screen appears. In this screen, you can change the host name, specify a Network Time Protocol (NTP) server, and modify the IP configuration for the **command** network port and the **Dolby Atmos Connect** input port.

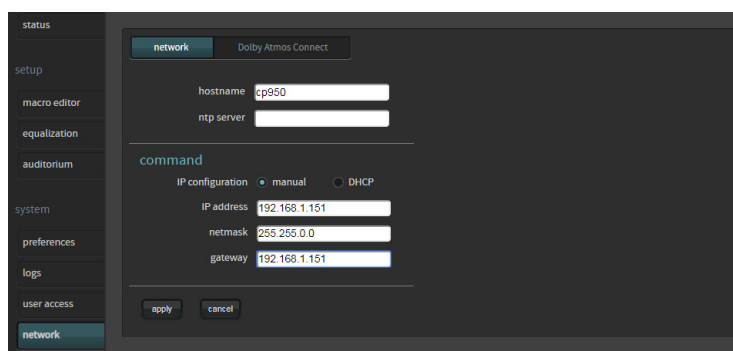


Figure 3-67 Modifying the Network Settings

If you click the **Dolby Atmos Connect** tab, these parameters default to **legacy mode**, as shown in the following figure. This is the most efficient mode for connecting to other devices, for example, a Dolby Multichannel Amplifier or Dolby DAC3202.

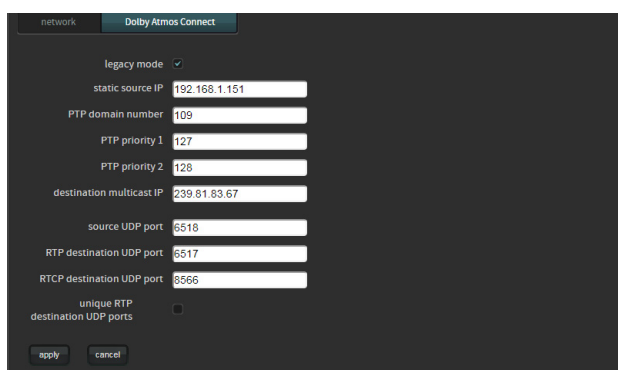


Figure 3-68 Setting up the Dolby Atmos Connect Parameters (Legacy Mode)

If you are integrating with third-party devices, you can uncheck **legacy mode** and enter source and destination RTP settings for channels 1–8 and 9–16, as shown in the following figure.

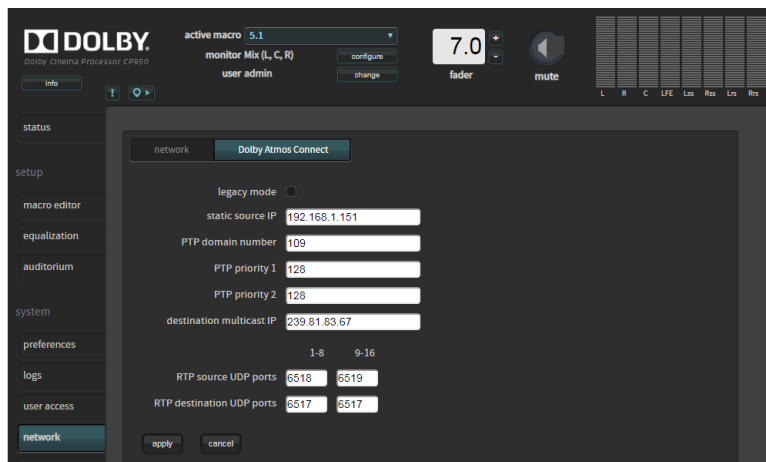


Figure 3-69 Setting up the Dolby Atmos Connect Parameters (Nonlegacy Mode)

Following is a description of the **Dolby Atmos Connect** parameters.

Static Source IP Address

In this field, you can change the default Dolby Atmos Connect static IP address. You do not need to change this default value. However, all other devices in the audio chain should have similar IP addresses, except for the last octet, which you need to change so there are no IP address conflicts.

PTP Domain Number and Priority

PTP (precision time protocol) maintains the audio synchronization between the playback device and any connected devices within an auditorium, such as a Dolby Multichannel Amplifier or Dolby DAC3202. The default setting is **109**. If only one auditorium within a facility has a Dolby Multichannel Amplifier installed, we recommend that you retain this default value.

If more than one auditorium has a Dolby Atmos Connect Network, we recommend keeping the networks separate so you can use the same PTP parameters for the screen in each network.

In some cases, you may have more than one auditorium interconnected on the same network. We do not recommend such a configuration. In such cases, you must enter unique PTP values for each auditorium. The PTP domain number in this field must match the PTP domain number in the other connected devices in the auditorium.

PTP priority 1 can remain at 127. This is the default setting and correctly sets the CP950 as the highest-priority clock in the AES67 network. Other devices in the audio chain should have a PTP priority of 128 or higher. PTP priority 2 can remain at 128.

Destination Multicast IP

The destination multicast IP address identifies the main IP address used in audio transmission. The CP950 and any downstream devices in the auditorium should use the same exact IP address.

The default IP address is 239.81.83.67 for the Dolby CP950, Dolby Mutichannel Amplifier, and Dolby DAC3202.

If more than one auditorium has a Dolby Atmos Connect Network, we recommend keeping the networks separate so you can use the same destination multicast parameters for the screen in each network.

In some cases, you may have more than one auditorium interconnected on the same network. We do not recommend such a configuration. In such cases, you must enter a different destination multicast IP address for each auditorium.

RTP Source and RTP Destination UDP Ports

The system transmits audio in streams of eight channels. The CP950 is a 16-channel audio processor, which provides two streams of eight channels.

The system sends audio packets with two important values: RTP source and RTP destination UDP ports. Downstream devices with matching values accept these audio packets and ignore packets with no matching values.

The default channels 1–8 are:

Source = 6518

Destination = 6517

The default channels 9–16 are:

Source = 6519

Destination = 6517

If you hover over these fields, you can enter the desired UDP settings for each channel bank.

You can manually change the source and destination RTP ports by disabling legacy mode. This enables you to easily set up a third-party device configuration.

RTCP Destination UDP Port

The RTCP destination UDP port allows an external device to monitor the system for some quality-of-service and control data. This setting does not affect the transmission of the audio and can be left at the default value of 8566.

Unique RTP Destination UDP Ports

Typically, the RTP Destination UDP ports are the same, with a default value of 6517. When activated, this selection forces the system to use different values for the RTP destination UDP ports. 6517 is used for channels 1–8, and 6518 is used for channels 9–16. This can be useful when integrating with third-party audio receivers that require unique values. If you are using all Dolby receiving devices, you can leave this setting unchecked.

3.9 Performing Maintenance Tasks

If you are a technician or a system administrator, select **maintenance** in the **system** menu to perform maintenance tasks.

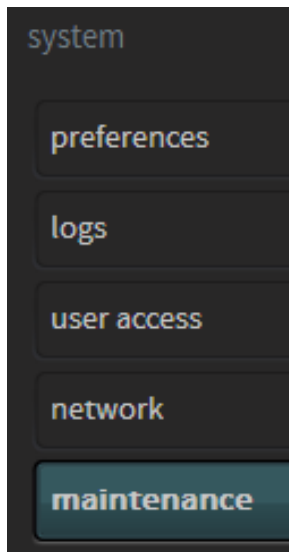


Figure 3-70 Select Maintenance in the System Menu

The **maintenance** screen appears. In this screen, you can upgrade the system, and back up, restore, and reset system settings.



Figure 3-71 Maintenance Screen

Following is a description of each of the **maintenance** screen operations.

Upgrade

To upgrade your CP950 system software:

1. Obtain the .dlb upgrade file from Dolby Laboratories at <https://www.dolbycustomer.com>.
2. Copy the upgrade file to your local disk.
3. Click **Choose File**, then click **upload**.
4. Confirm the displayed upgrade file version, then click **install upgrade**.
The system initiates the upgrade process, displays the progress, and reboots the CP950 when the upgrade is completed.

Settings Management

The **maintenance** screen provides the following tools in the **settings management** pane:

The **backup** tool enables you to back up all of the CP950 system settings, which include:

- Auditorium configuration: Size and shape of room, channel routing, and EQ presets
- Current macros and delays
- Preferences and network settings
- Current system state (active macro, fader level, alerts, and so on) at the time of the backup (collectively called operational state snapshot)

1. Click the **backup** button
The system defines the name of the backup file, but you can add additional information in the provided box.
2. Click the **create backup** button to save the .dac restore file in the designated directory on your PC.

The **restore** tool enables you to restore all of the CP950 system settings (except user access) or select specific settings (by clicking in the corresponding boxes).

1. Click the **restore** button at the upper-right side of the screen, then click **Choose File** to select a .dac restore file.
2. Click the **restore** button at the lower-right side of the screen to run the restoration process.

The **reset** tool enables you to clear the current CP950 settings and start over in different parts of the system. Resetting the current system state (collectively called operational state snapshot) may help to clear false alerts.

1. Click the **reset** button at the upper-right side of the screen.
You can reset your system to the factory defaults (except for user access) or reset specific factory settings (by clicking in the corresponding boxes).
2. Click the **reset** button at the lower-right side of the screen to run the reset operation.

3.10 Rebooting the System

If you have technician- or administrator-level access, you can reboot the CP950 by clicking **reboot** in the **system** menu, and then clicking the displayed **reboot** button. A prompt appears where you need to enter your password. Note that this is a soft system reboot and may not fix some problems that you may experience. In some situations, a hard reboot (removing the power cord for 10 seconds) can be more useful.

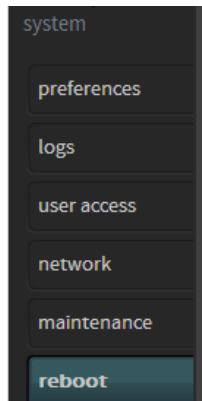


Figure 3-72 Rebooting the System

3.11 Downloading CP950 Essentials

When you click **downloads** in the **system** menu, you can access:

- This manual in available languages
- Web services WSDL for controlling the CP950 using an API
- Simple Network Management Protocol (SNMP) Management Information Base (MIB) files for remote monitoring
- Dolby Atmos Designer software (Microsoft Windows and Apple Macintosh versions)
- Third-party software documentation

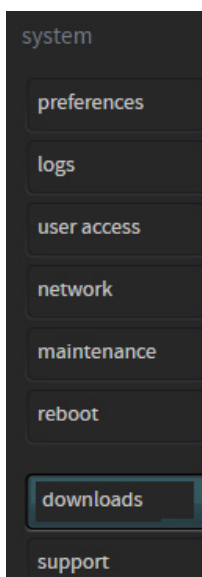


Figure 3-73 Select Downloads in System Menu

3.12 Contacting Dolby Support

To find information on how to contact the Dolby Cinema Solutions and Support team, click **support** in the **system** menu.

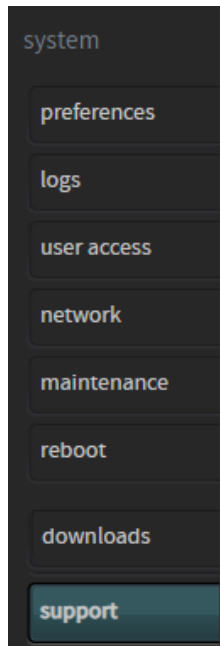


Figure 3-74 Click Support in System Menu

Configuring the Equalization Parameters

This chapter describes three methods for configuring the Dolby® CP950 equalization (EQ) parameters. You can use any of these methods, depending on your requirements:

- Equalize an auditorium with the CP950 real-time analyzer by starting a new macro EQ preset, and then use the standard one-third octave EQ, which is similar to the Dolby CP750 EQ (or the CP950 **Grossman eq**, which allows you to zoom in and make finer adjustments), as described in [Section 4.1](#).
- Configure an auditorium with crossovers or a mix of analog and digital outputs using Dolby Atmos Designer (DAD), then upload that room configuration to the CP950, and use the standard one-third octave EQ, which is similar to the Dolby CP750 EQ (or the **Grossman eq**, which allows you to zoom in and make finer adjustments), as described in [Section 4.2](#).
- Create a room configuration using DAD and use Dolby AutoEQ, which is similar to the Dolby CP850 EQ, to equalize the room, as described in [Section 4.3](#).



Note: To use internal crossovers or both analog and digital outputs at the same time, you must use the DAD software.

Before using any of these methods:

1. Use the front-panel user interface (FPUI) to change the default IP address to your cinema networking standard and connect to the CP950 web client.
2. Connect to the CP950 web client using Google Chrome version 71.x or later (for best results).
3. Check the CP950 software version by clicking **maintenance** in the web client. If the version is not up to date with the current CP950 software on www.dolbycustomer.com, download and install the current version.

If you want to use DAD for the installation, you must use DAD version 3.2.x or higher.

You can download the current version of DAD software by clicking **downloads** in the CP950 navigation bar. You can also download the current version of DAD software, release notes, and manual at www.dolbycustomer.com. In addition, you can access the DAD manual and release notes from the DAD software **Help** menu.

4.1 Configuring Equalization with the CP950 Real-Time Analyzer

This section explains how to use the CP950 web client user interface to configure a room and equalize the auditorium.

4.1.1 Configuring the Room

To configure a room:

1. Click **auditorium** in the navigation bar at the left side of the screen, and then click the **configure room** tab to display the **configure room** screen.
2. Click in the **room configuration** field to display the drop-down menu, and then select the room configuration you want to use.

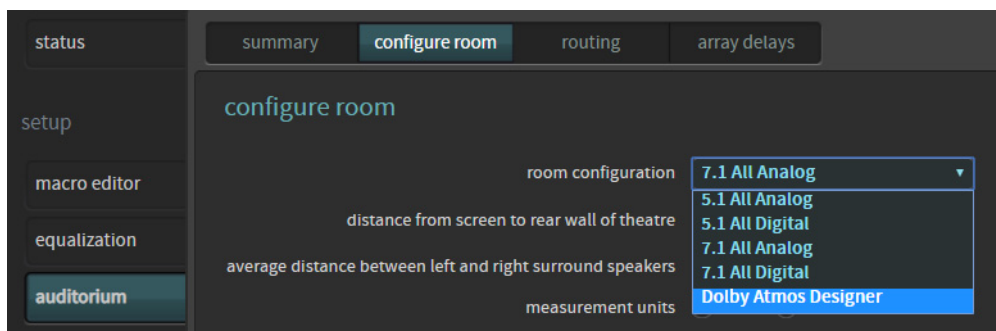


Figure 4-1 Configure Room Screen Drop-Down Menu

You can select a room configuration for:

- **5.1 All Analog:** Three screen channels (L, C, R), one subwoofer (LFE), and two surround zones (LSS, RSS). The system uses the top DB25 connector (**CHANNEL 1-8 ANALOG OUT**) to output all channels as analog audio.
- **5.1 All Digital:** Three screen channels (L, C, R), one subwoofer (LFE), and two surround zones (LSS, RSS). The system uses the **DOLBY ATMOS CONNECT OUT** port to output all channels as digital audio.
- **7.1 All Analog:** Three screen channels (L, C, R), one subwoofer (LFE), and four surround zones (LSS, LRS, RRS, RSS). The system uses the top DB25 connector (**CHANNEL 1-8 ANALOG OUT**) to output all channels as analog audio.
- **7.1 All Digital:** Three screen channels (L, C, R), one subwoofer (LFE), and four surround zones (LSS, LRS, RRS, RSS). The system uses the **DOLBY ATMOS CONNECT OUT** port to output all channels as digital audio.

For analog and digital 5.1 configurations, the system outputs:

Speaker	Analog	Digital
Left	Channel 1	Channel 1
Right	Channel 2	Channel 2
Center	Channel 3	Channel 3
LFE	Channel 4	Channel 4
Left Side Surround (side and back walls)	Channel 5	Channel 5
Right Side Surround (side and back walls)	Channel 6	Channel 6

For analog and digital 7.1 configurations, the system outputs:

Speaker	Analog	Digital
Left	Channel 1	Channel 1
Right	Channel 2	Channel 2
Center	Channel 3	Channel 3
LFE	Channel 4	Channel 4
Left Side Surround	Channel 5	Channel 5
Right Side Surround	Channel 6	Channel 6
Left Rear Surround	Channel 7	Channel 7
Right Rear Surround	Channel 8	Channel 8

Switching between room configurations can take up to one minute.

You may notice that the surround speaker positions are not located where you have physical speakers, as in this figure.

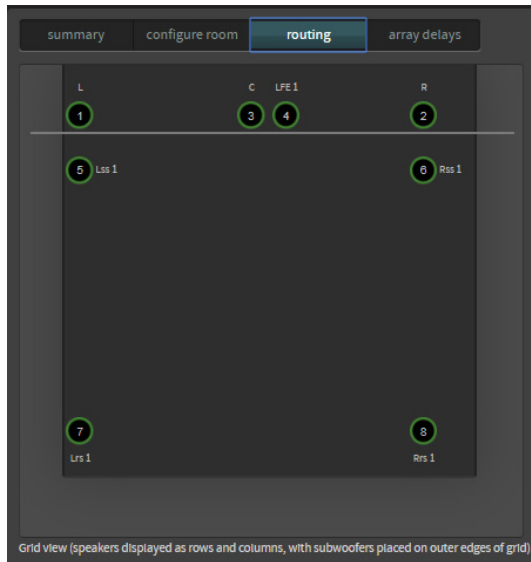


Figure 4-2 Default Speaker Positions for 7.1 Room

- After selecting the room configuration, enter the distance from the screen to the rear wall of the theatre and the average distance between left and right surround speakers. This is similar to the method used when entering a CP750 room configuration. This enables the system to determine the surround speaker delay. You can toggle this entry between feet and meters and can enter only whole numbers (no fractions or decimals).

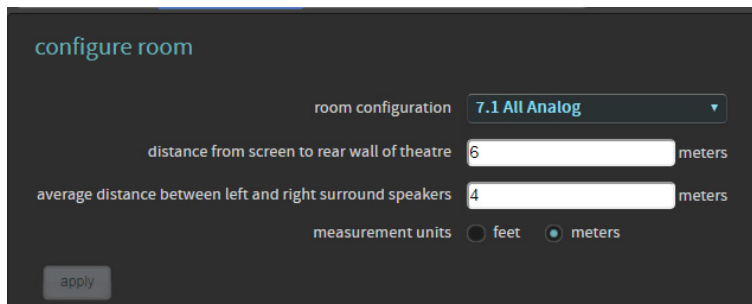


Figure 4-3 Enter Distances

Digital users proceed to the next section ([Section 4.1.2](#)). Analog users can skip this next section and proceed to [Section 4.1.3](#).

4.1.2 Configuring a Digital Output

If you selected a digital output room configuration, the system default is **AES67**, which enables an easy connection to a Dolby Multichannel Amplifier. If you need BLU Link, select **Preferences** in the navigation bar at the left side of the screen, and then switch from **AES67** to **BLU Link**.

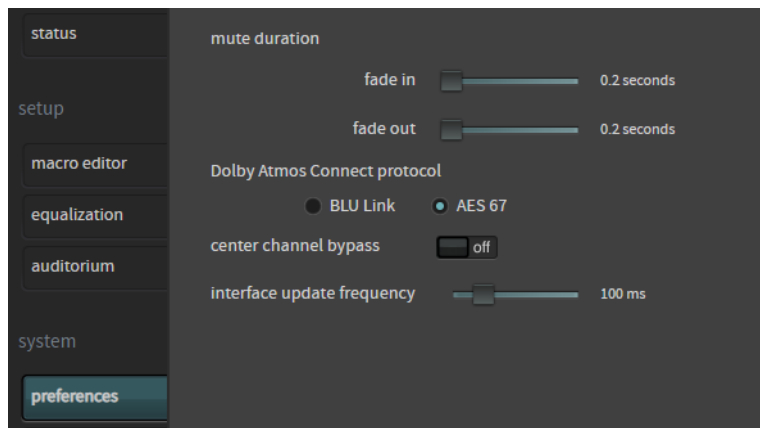


Figure 4-4 Preferences Screen



Note: You may also need to make additional changes by clicking **network** in the navigation bar, and then clicking the **Dolby Atmos Connect** tab. For related information, see [Section 3.8](#).

4.1.3 Configuring the Equalization Parameters

To run equalization in the web client, select **equalization** in the navigation bar at the left side of the screen.

The real-time analyzer EQ screen appears in the **equalization** screen.



Figure 4-5 Real-Time Analyzer EQ Screen

The system defaults to an EQ preset named **AutoEQ**. You cannot change this preset. To configure EQ you need to create an editable copy of **AutoEQ**.

4.1.4 Adding an Equalization Preset

To add a new equalization preset:

1. Click the  button.

You are prompted to base your new preset on either the **AutoEQ** preset or a copy of a previously created customized preset. In either case, you must also enter a name for your new preset. Alternatively, you can create a new customized preset by following the instructions in [Section 3.3.2](#).

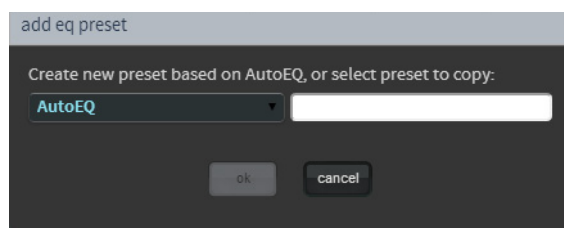


Figure 4-6 Add an EQ Preset

2. Enter a name for your new preset, then click the **ok** button to save your new preset. This documentation uses the name **custom** as an example.

3. Click the activated **edit** button, which unlocks the equalization controls. The **edit** button changes to a **save** button, and a **cancel** button appears, which allows you to cancel your entries.

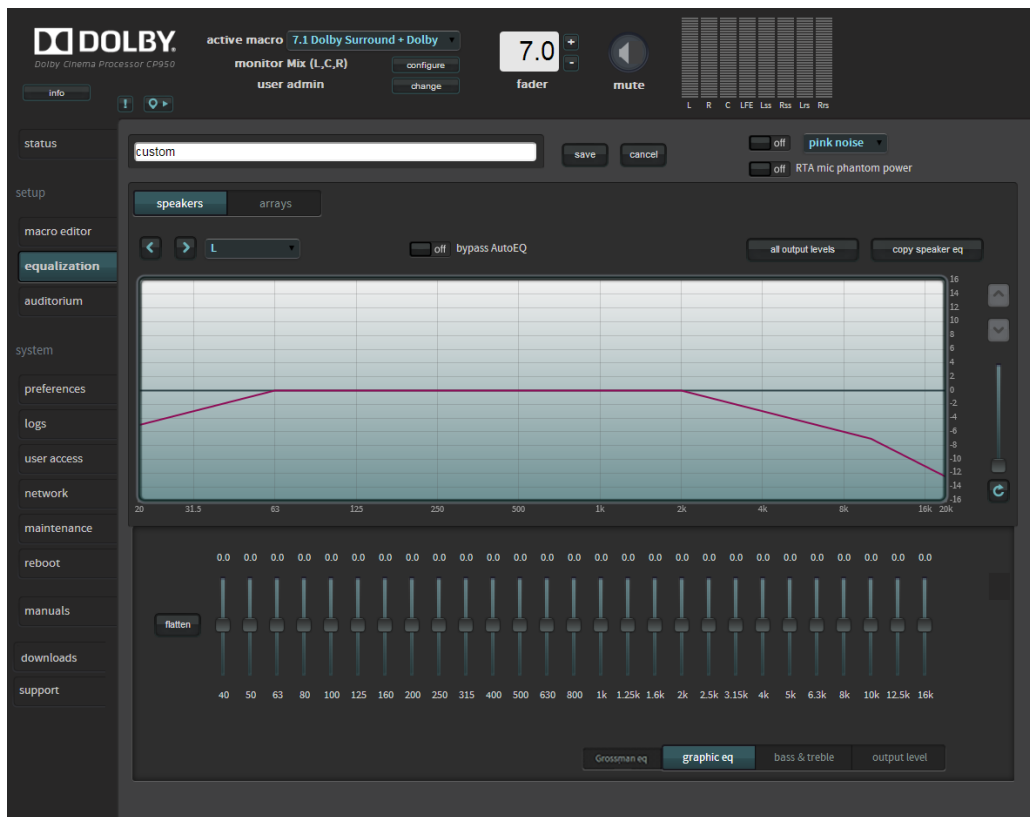


Figure 4-7 Equalization Parameters Activated for Editing

4.1.5 Beginning the Equalization Process

The CP950 provides a test-signal generator. This generator can output several different test signals to assist equalizing the auditorium.

1. Click the **on/off** toggle button to play the test tone or turn it off.
2. Click in the **on/off** field to display a drop-down menu where you can select the desired of test tone you want to generate.

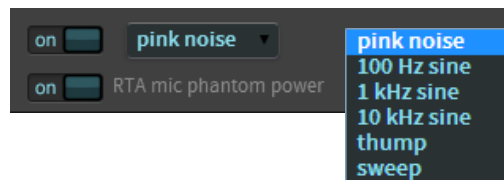


Figure 4-8 Real-Time Analyzer Test-Signal Generator and Microphone Phantom Power

The default output level for pink noise, thump, and sine signal tones is -30 dBFS. The default output level for the sweep signal tone is -40 dBFS.

- While configuring the EQ for a speaker, you can temporarily disable the EQ by clicking the **bypass AutoEQ on/off** button to toggle back and forth and hear the changes you make.

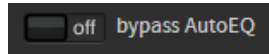


Figure 4-9 Bypass AutoEQ

- Click on the **graphic eq** button (if not already selected), and drag each slider to adjust the gain throughout the range of frequencies, as shown on the real-time analyzer EQ display. This is the standard one-third octave EQ. Click the **flatten** button to flatten the curve.



Figure 4-10 Graphic Equalizer

After configuring all of the desired parameters, click the **save** button to create and save your new preset. You can now proceed to the next step in [Section 4.1.7](#) or first use **Grossman eq** for fine-tuning as described in the next section ([Section 4.1.6](#)).

4.1.6 Fine-Tuning With Grossman eq

Grossman eq is an equalization (EQ) tool that enables finer room tunings. It is provided for technician- or admin-level users. As you zoom in on the display, it allows you to control narrowband EQ. This tool displays an interface that provides users with the ability to utilize the one-twelfth octave capabilities of the CP950, CP850, and IMS3000 equalizers. The existing bass, treble, and one-third octave controls provide broadband equalization at fixed frequencies that limit equalization flexibility. Grossman eq provides controls that allow users to narrowly or broadly adjust the frequency response at any point from 20 Hz to 20 kHz.

When you click **equalization** in the navigation bar, and then click the **edit** button to edit equalization for one of your custom presets, a **Grossman eq** button appears in the equalization screen (to the left of the **graphics eq** button), as shown in the following figures.

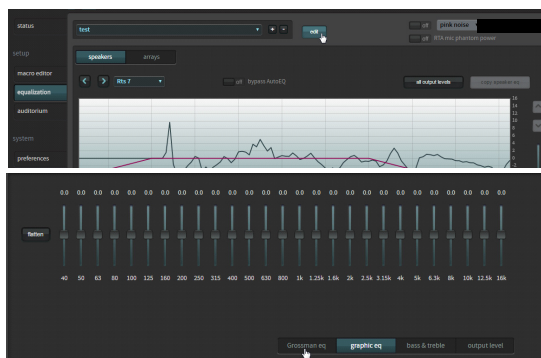


Figure 4-11 Grossman eq Button

When you click the **Grossman eq** button, the Grossman eq screen appears. The example in the next figure shows a graph that displays a Grossman eq frequency curve (in green) that a user can create by utilizing the specialized Grossman eq tools that are shown in the figure (and described in the following sections). In addition, the graph displays the resulting sum of all input to the eq curve (in black), which includes auto eq, Grossman eq, graphic eq, bass and treble, and output level. The x curve is displayed in red (as it is in the other equalization screens).



Figure 4-12 Grossman EQ Screen

Following is a description of the controls in the **Grossman eq** screen, as shown in the previous figure.

Grossman Equalizer Sliders

You can drag each of these sliders to adjust the gain throughout the range of frequencies shown on the graph. The number above each of these sliders represents the position of the slider from -10 dB gain to +10 dB gain. This corresponds with the center band of all bands that the slider represents. The number below each of these sliders denotes the frequency (Hz) of the center band of all bands represented by that slider.

Horizontal Slider

The horizontal zoom slider affects the number of one-twelfth octave EQ bands that you control with the Grossman equalizer sliders. When you move a slider slowly to the right, the number of bands decreases by 1. At its left-most position, the slider corresponds to 15 bands per slider, and at its right-most position, it corresponds to one band per slider. Note that each slider may affect more than this precise number of bands, due to smoothing of the EQ curve. You can zoom in and out to keep the center band of the graph constant as far as possible. (It must also adjust for either end of the graph while zooming out.)

Panning affects which bands the sliders manipulate. You can also pan around (when not fully zoomed out) by dragging the graph left and right, or by using the arrow buttons next to the slider. The arrow buttons move the graph left or right one band at a time.

The refresh button resets the zoom slider back to 15 bands per slider.

Replace and Add Buttons

These buttons denote two modes of operation. When you click **replace** and move an equalizer slider to a different position to change a setting, this replaces the Grossman band gains (the green plot only) with the new setting. When you click **add** and move a slider to a different position, this adds the new changes to the existing Grossman band gains. Note that in add mode, it is possible to set band gains beyond the range of the sliders, that is, beyond the [-10 dB, +10 dB] range. In such a case, the Grossman band gains (only the green plot) are saturated at +10 dB or -10 dB. Grossman eq remembers the shape of the curve before it was saturated, so if you reduce the level (which desaturates), the original shape is retained.

Flatten Button

When you click **flatten**, Grossman eq sets all of the visible bands to 0 dB gain by flattening only the area of the EQ range that is currently visible on the graph, based on the zoom slider setting.

Grossman eq Results

After using the above controls, be sure to click **save** at the top of the screen to retain your changes (or **cancel** to discard your changes). After saving your settings, the main **equalization** screen should now display the resulting 20 Hz to 20 kHz curve (without the markup of the Grossman eq contribution).

After configuring all of the desired parameters, click the **save** button to create your new preset. You can delete a customized preset by clicking the minus (-) button. You cannot delete the **AutoEQ** preset.

4.1.7 Configuring the Macro Editor

After equalizing the auditorium, select **macro editor** in the navigation bar, and change the **eq preset** for all of your current macros to the new preset you created.

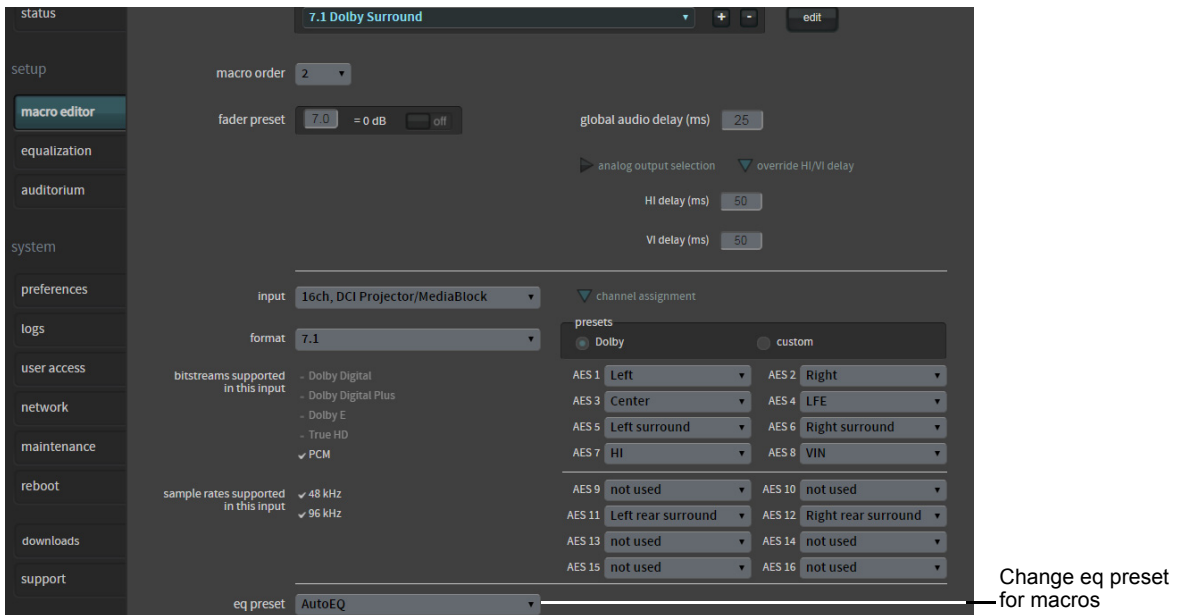


Figure 4-13 Enter New EQ Preset for All Macros

4.1.8 Finalizing the Equalization

After completing the previous steps:

- Test the CP950 audio playback to ensure proper operation and sound.
- Click **maintenance** in the navigation bar and back up your system settings.
- Save the backup in a safe place for future use.

4.2 Using Dolby Atmos Designer and One-Third Octave EQ

This section explains how to use DAD to configure a room with a mix of analog and digital outputs or internal crossovers, and then use the standard one-third octave EQ (not using Dolby AutoEQ).

You can connect to the CP950 in DAD version 3.2 or higher by entering its IP address. To ensure the correct device configuration, you must change the **target device** field under the DAD **define > routing** tab to **CP950**.

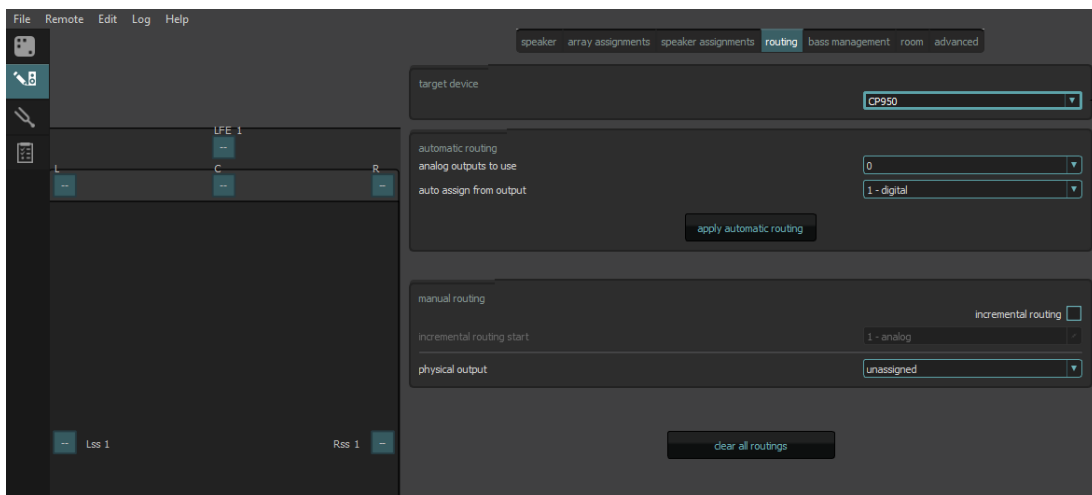


Figure 4-14 Select CP950 as Target Device in Dolby Atmos Designer



Note: The CP950 is a 16-channel processor and using one output channel in digital or analog disables that channel for the other output type. For example, if you output from digital channel 1, analog channel 1 is disabled as an output channel. If you output from analog channel 9, digital channel 9 is disabled.

You can download the current version of DAD software by clicking **downloads** in the CP950 navigation bar. You can also download the current version of DAD software, release notes, and manual at www.dolbycustomer.com. In addition, you can access the DAD manual and release notes from the DAD software **Help** menu.



Note: We provide a Dolby Atmos Designer video tutorial at: <https://vimeo.com/showcase/4989198/video/280122204>

Digital users proceed to the next section ([Section 4.2.1](#)). Analog users can skip this next section and proceed to [Section 4.1.3](#).

4.2.1 Configuring a Digital Output

If you selected a digital output room configuration, the system default is **AES67**, which enables an easy connection to a Dolby Multichannel Amplifier. If you need BLU Link, select **Preferences** in the navigation bar at the left side of the screen, and then switch from **AES67** to **BLU Link**.

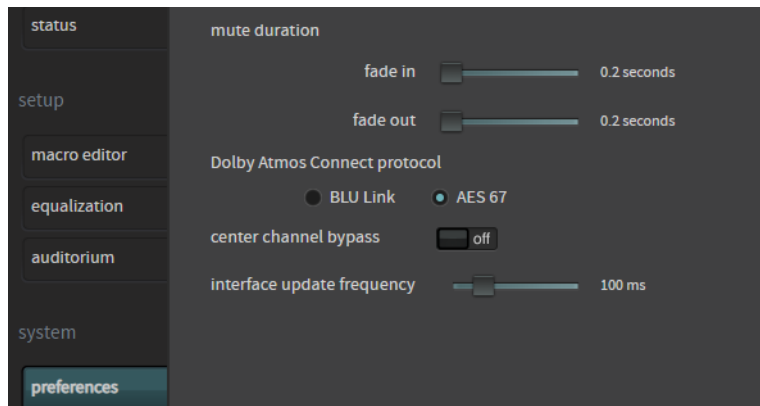


Figure 4-15 Preferences screen



Note: You may also need to make additional changes by clicking **network** in the navigation bar, and then clicking the **Dolby Atmos Connect** tab. For related information, see [Section 3.8](#).

4.2.2 Creating the Room in Dolby Atmos Designer

To create a room and perform DAD operations, see the instructions in the *Dolby Atmos Designer User's Manual*. You can mix analog and digital outputs but cannot exceed 16 channels, which is the maximum number of channels supported by the CP950. After you create a room, save a copy of the DAD.dac file, and then:

1. Push the room configuration to the CP950 using DAD.
2. Click **auditorium** in the CP950 navigation bar, and then click the **configure room** tab.

Dolby Atmos Designer should be the selected for the **room configuration**. This confirms that the system is using the room you created.

To confirm that your settings are correct, click the **summary** or **routing** tab.

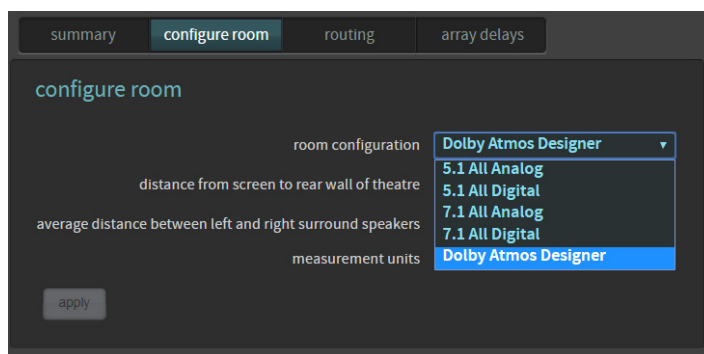


Figure 4-16 Dolby Atmos Designer Selected for Room Configuration

4.2.3 Configuring the Equalization Parameters

To run equalization in the web client, select **equalization** in the navigation bar at the left side of the screen.

The real-time analyzer EQ screen appears in the **equalization** screen.



Figure 4-17 Real-Time Analyzer EQ Screen

The system defaults to an EQ preset named **AutoEQ**. You cannot change this preset. To configure EQ you need to create an editable copy of **AutoEQ**.

4.2.4 Adding an Equalization Preset

To add a new equalization preset:

1. Click the  button.

You are prompted to base your new preset on either the **AutoEQ** preset or a copy of a previously created customized preset. In either case, you must also enter a name for your new preset. Alternatively, you can create a new customized preset by following the instructions in [Section 3.3.2](#).

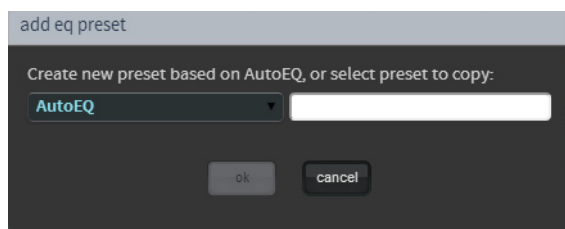


Figure 4-18 Add an EQ Preset


2. Enter a name for your new preset, then click the **ok** button to save your new preset. This documentation uses the name **custom** as an example.
3. Click the activated **edit**  button, which unlocks the equalization controls. The **edit** button changes to a **save** button, and a **cancel** button appears, which allows you to cancel your entries.



Figure 4-19 Equalization Parameters Activated for Editing

4.2.5 Beginning the Equalization Process

The CP950 provides a test-signal generator. This generator can output several different test signals to assist equalizing the auditorium.

1. Click the **on/off** toggle button to play the test tone or turn it off.
2. Click in the **on/off** field to display a drop-down menu where you can select the type of test tone you want to generate.

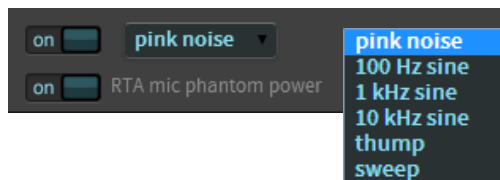


Figure 4-20 Real-Time Analyzer Test-Signal Generator and Microphone Phantom Power

The default output level for pink noise, thump, and sine-signal tones is -30 dBFS. The default output level for the sweep signal tone is -40 dBFS.

- While configuring the EQ for a speaker, you can temporarily disable the EQ by clicking the **bypass AutoEQ on/off** button to toggle back and forth and hear the changes you make.

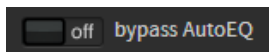


Figure 4-21 Bypass AutoEQ

- Click on the **graphic eq** button (if not already selected), and drag each slider to adjust the gain throughout the range of frequencies, as shown on the real-time analyzer EQ display. This is the standard one-third octave EQ. Click the **flatten** button to flatten the curve.



Figure 4-22 Graphic Equalizer

After configuring all of the desired parameters, click the **save** button to create and save your new preset. You can now proceed to the next step in [Section 4.1.7](#) or first use **Grossman eq** for fine-tuning as described in the next section ([Section 4.1.6](#)).

4.2.6 Fine Tuning With Grossman eq

Grossman eq is an equalization (EQ) tool that enables finer room tunings. It is provided for technician- or admin level users. As you zoom in on the display, it allows you to control narrowband EQ. This tool displays an interface that provides users with the ability to utilize the one-twelfth octave capabilities of the CP950, CP850, and IMS3000 equalizers. The existing bass, treble, and one-third octave controls provide broadband equalization at fixed frequencies that limit equalization flexibility. Grossman eq provides controls that allow users to narrowly or broadly adjust the frequency response at any point from 20 Hz to 20 kHz.

When you click **equalization** in the navigation bar, and then click the **edit** button to edit equalization for one of your custom presets, a **Grossman eq** button appears in the equalization screen (to the left of the **graphics eq** button), as shown in the following figures.

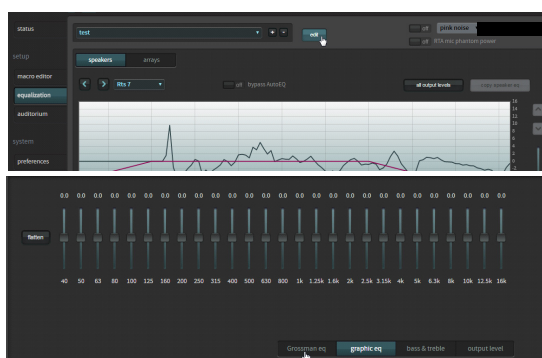


Figure 4-23 Grossman eq Button

When you click the **Grossman eq** button, the Grossman eq screen appears. The example in the following figure shows a graph that displays a Grossman eq frequency curve (in green) that a user can create by utilizing the specialized Grossman eq tools that are shown in the figure (and described in the following sections). In addition, the graph displays the resulting sum of all input to the eq curve (in black), which includes auto eq, Grossman eq, graphic eq, bass and treble, and output level. The x curve is displayed in red (as it is in the other equalization screens).



Figure 4-24 Grossman EQ Screen

Following is a description of the controls in the **Grossman eq** screen, as shown in the previous figure.

Grossman Equalizer Sliders

You can drag each of these sliders to adjust the gain throughout the range of frequencies shown on the graph. The number above each of these sliders represents the position of the slider from -10 dB gain to $+10$ dB gain. This corresponds with the center band of all bands that the slider represents. The number below each of these sliders denotes the frequency (Hz) of the center band of all bands represented by that slider.

Horizontal Slider

The horizontal zoom slider affects the number of one-twelfth octave EQ bands that you control with the Grossman equalizer sliders. When you move a slider slowly to the right, the number of bands decreases by 1. At its left-most position, the slider corresponds to 15 bands per slider, and at its right-most position, it corresponds to one band per slider. Note that each slider may affect more than this precise number of bands, due to smoothing of the EQ curve. You can zoom in and out to keep the center band of the graph constant as far as possible. (It must also adjust for either end of the graph while zooming out.)

Panning affects which bands the sliders manipulate. You can also pan around (when not fully zoomed out) by dragging the graph left and right, or by using the arrow buttons next to the slider. The arrow buttons move the graph left or right one band at a time.

The refresh button resets the zoom slider back to 15 bands per slider.

Replace and Add Buttons

These buttons denote two modes of operation. When you click **replace** and move an equalizer slider to a different position to change a setting, this replaces the Grossman band gains (the green plot only) with the new setting. When you click **add** and move a slider to a different position, this adds the new changes to the existing Grossman band gains. Note that in add mode, it is possible to set band gains beyond the range of the sliders, that is, beyond the [-10dB, +10dB] range. In such a case, the Grossman band gains (only the green plot) are saturated at +10dB or -10dB. Grossman eq remembers the shape of the curve before it was saturated, so if you reduce the level (which desaturates), the original shape is retained.

Flatten Button

When you click **flatten**, Grossman eq sets all of the visible bands to 0 dB gain by flattening only the area of the EQ range that is currently visible on the graph, based on the zoom slider setting.

Grossman eq Results

After using the above controls, be sure to click **save** at the top of the screen to retain your changes (or **cancel** to discard your changes). After saving your settings, the main **equalization** screen should now display the resulting 20 Hz to 20 kHz curve (without the markup of the Grossman eq contribution).

After configuring all of the desired parameters, click the **save** button to create your new preset. You can delete a customized preset by clicking the minus (-) button. You cannot delete the **AutoEQ** preset.

4.2.7 Configuring the Macro Editor

After equalizing the auditorium, select **macro editor** in the navigation bar, and change the **eq preset** for all of your current macros to the new preset you created.

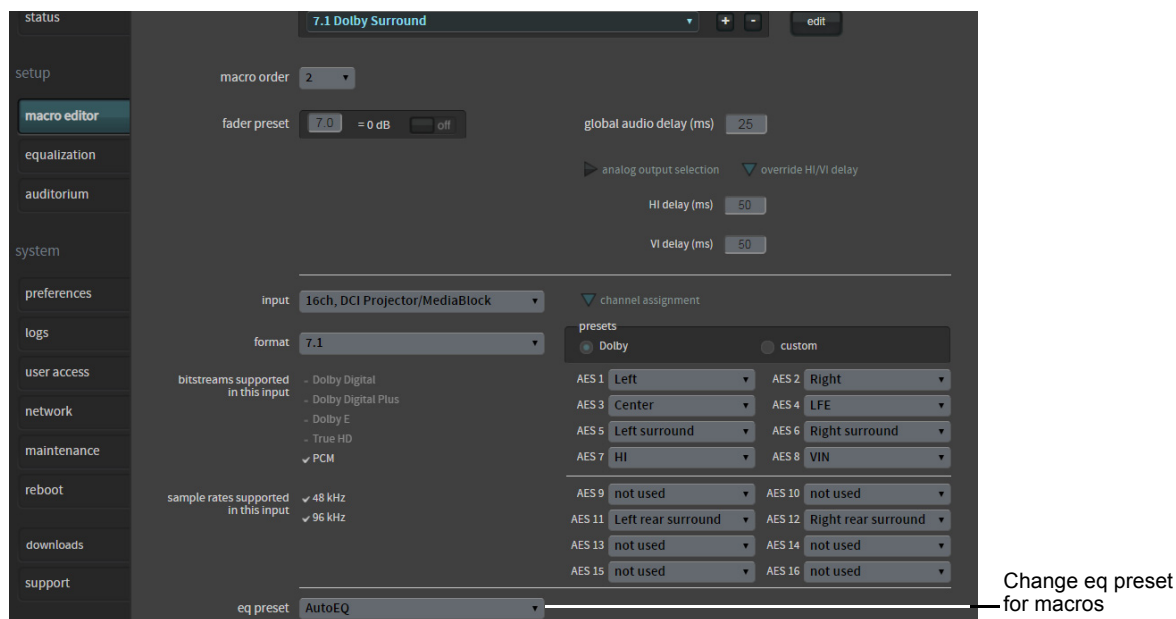


Figure 4-25 Enter New EQ Preset for All Macros

4.2.8 Finalizing the Equalization

After completing the previous steps:

- Test the CP950 audio playback to ensure proper operation and sound.
- Click **maintenance** in the navigation bar and back up your system settings.
- Save the backup in a safe place for future use.

4.3 Configuring a Room Using Dolby Atmos Designer and AutoEQ

This section shows you how to use Dolby Atmos Designer to configure a room and then use Dolby AutoEQ.

You can connect to the CP950 in DAD version 3.2 or higher by entering its IP address. To ensure the correct device configuration, you must change the **target device** field under the DAD **define > routing** tab to **CP950**.

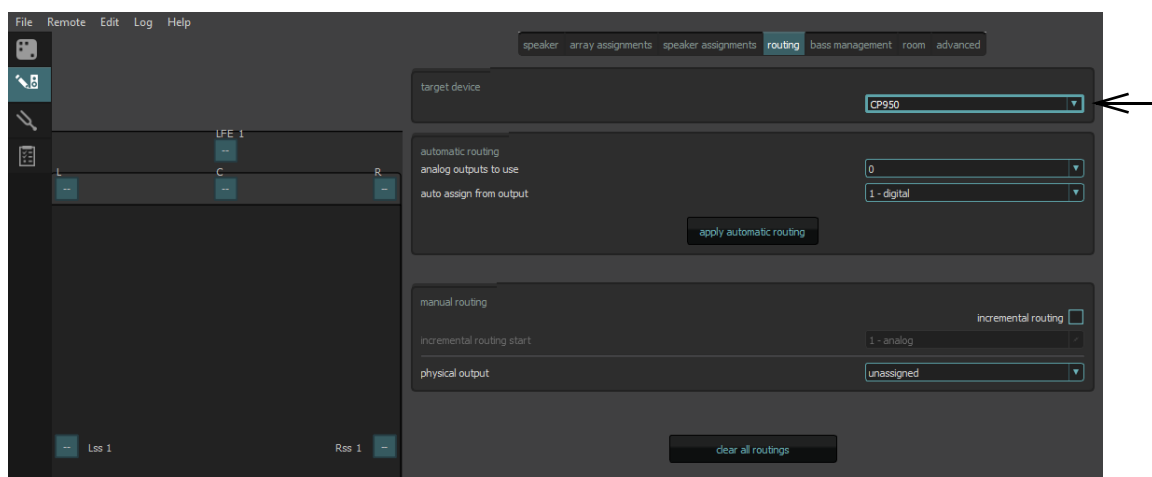


Figure 4-26 Select CP950 as Target Device in Dolby Atmos Designer

You can download the current version of DAD software by clicking **downloads** in the CP950 navigation bar. You can also download the current version of DAD software, release notes, and manual at www.dolbycustomer.com. In addition, you can access the DAD manual and release notes from the DAD software **Help** menu.

Digital users proceed to the next section ([Section 4.3.1](#)). Analog users can skip this next section and proceed to [Section 4.3.2](#).

4.3.1 Configuring a Digital Output

If you will be using a digital output room configuration, the system default is **AES67**, which enables an easy connection to a Dolby Multichannel Amplifier. If you need BLU Link, select **Preferences** in the navigation bar at the left side of the screen, and then switch from **AES67** to **BLU Link**.

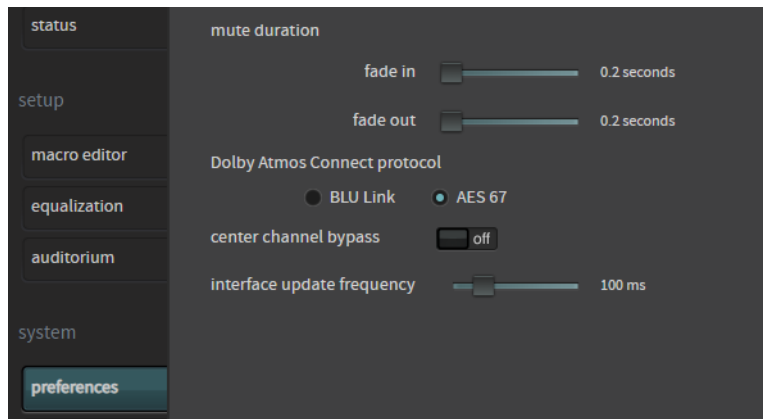


Figure 4-27 Preferences screen



Note: You may also need to make additional changes by clicking **network** in the navigation bar, and then clicking the **Dolby Atmos Connect** tab. For related information, see [Section 3.8](#).

4.3.2 Creating the Room in Dolby Atmos Designer and Running AutoEQ

To create a room and run AutoEQ in DAD, see the instructions in *Dolby Atmos Designer User's Manual*. You can mix analog and digital outputs but cannot exceed 16 channels, which is the maximum number of channels supported by the CP950. After you create a room and run AutoEQ, save a copy of the DAD.dac file, and then:

1. Push the room configuration to the CP950 using DAD.
2. Click **auditorium** in the CP950 navigation bar, and then click the **configure room** tab. **Dolby Atmos Designer** should be the selected for the **room configuration**. This confirms that the system is using the room you created.

To confirm that your settings are correct, click the **summary** or **routing** tab.

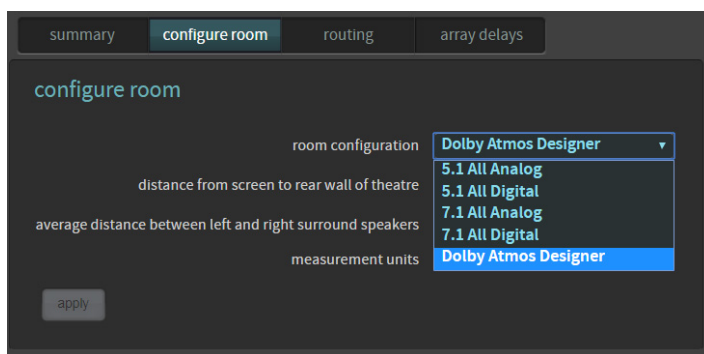


Figure 4-28 Dolby Atmos Designer Selected for Room Configuration

4.3.3 Configuring the Macro Editor

After equalizing the auditorium, select **macro editor** in the navigation bar, and change the **eq preset** for all of your current macros to the new preset you created.

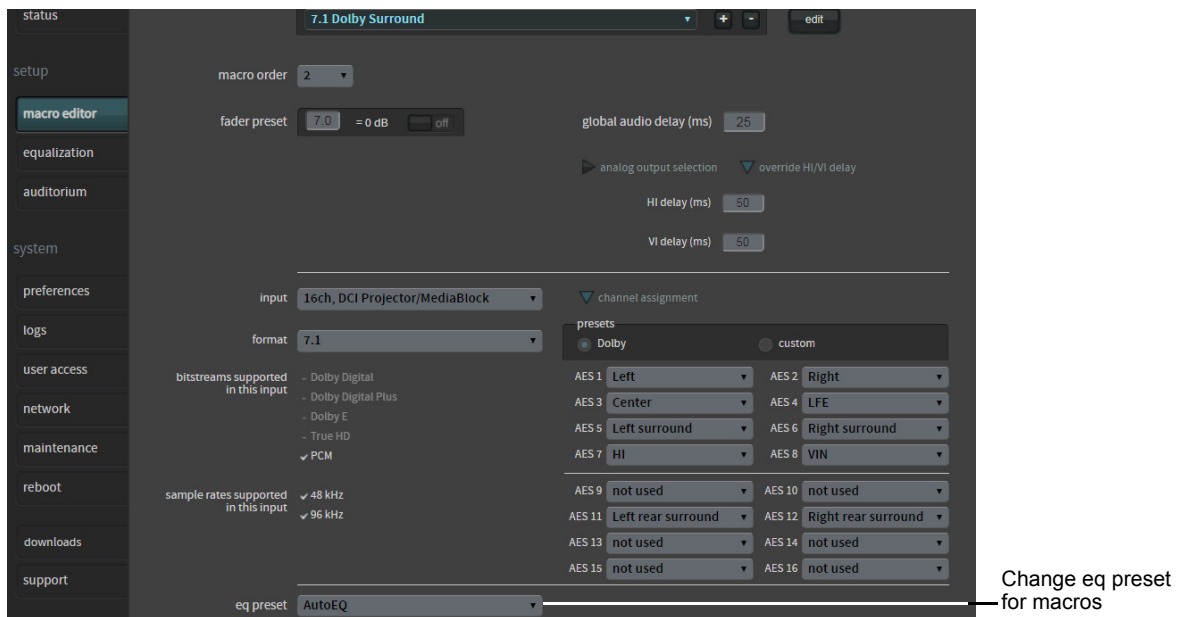


Figure 4-29 Enter New EQ Preset for All Macros

4.3.4 Finalizing the Equalization

After completing the previous steps:

- Test the CP950 audio playback to ensure proper operation and sound.
- Click **maintenance** in the navigation bar and back up your system settings.
- Save the backup in a safe place for future use.

Servicing the CP950

The CP950 architecture is a modular design that enables ease of maintenance and future upgrades. This chapter shows you how to troubleshoot any problems you may encounter and, if necessary, replace CP950 parts. You can order replacement parts from Dolby. (Applicable part numbers are provided throughout this chapter.)



Warning: To prevent electrical shock hazard, disconnect the CP950 mains power connection before troubleshooting or replacing parts. Place the CP950 on a stable and clutter-free service. Do not place the CP950 in any area where it may become wet. Avoid servicing the CP950 in the presence of extreme humidity, temperature, or amount of dust. Follow static-electricity protocols.

5.1 Replacing the CAT1700 Main Board

If there is a problem with inputs, outputs, Ethernet communication, or other basic operations, we recommend reseating the CAT1700 before replacing this board. This section shows you how to reseat the CAT1700 and how to replace it, if necessary (part number CAT1700).



Warning: To prevent electrical shock hazard, disconnect the CP950 mains power connection before proceeding.

To reseat or replace the CAT1700:

1. Power down the unit by disconnecting the power cord, and then disconnect all other connections.
2. Locate the CAT1700 and the two thumbscrews that secure the board to the chassis on the back of the CP950.



Figure 5-1 CAT1700 and Thumb Screws

3. Unscrew the thumbscrews in a counterclockwise direction. These screws are captured in the chassis and do not come out completely.

4. When the thumbscrews are no longer securing the CAT1700 to the chassis, carefully pull on the thumbscrews to remove the board.

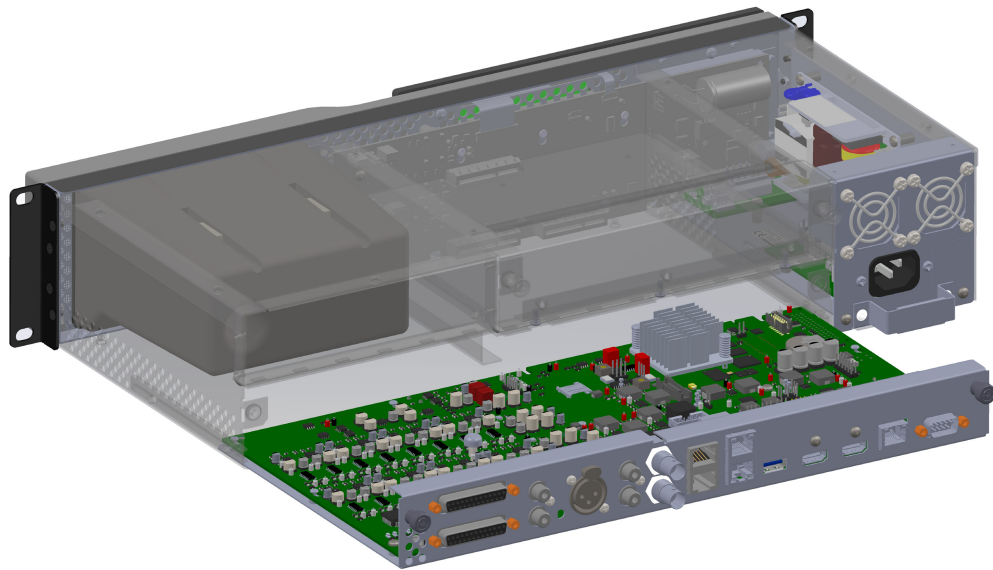


Figure 5-2 CAT1700 Removed

5. Inspect the CAT1700 for signs of damage to its components or the edge connector that plugs into the CAT1720. If there is damage, you need to replace the CAT1700.
6. To reseat or replace the existing CAT1700, align the circuit board with the guide rails on both sides. The CAT1700 sheet-metal tray will slide into the unit below the guide rails.

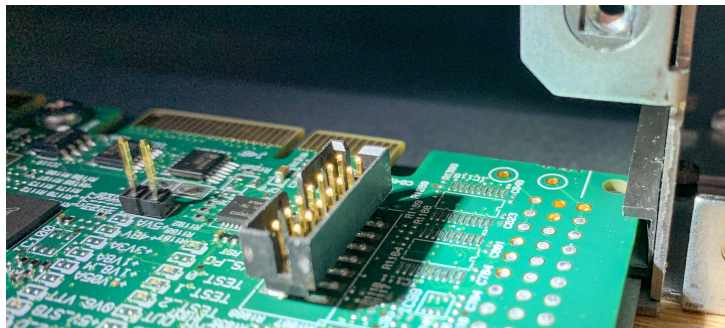


Figure 5-3 Align CAT1700 with Guide Rails

7. Push the CAT1700 carefully into its final position using the guide rails, and then use the thumbscrews to secure the board to the CP950 chassis.
8. The procedure is now complete.

5.2 Replacing the CAT1740 Power Supply

If the system is not booting, a power supply problem may be the reason. We recommend troubleshooting the power supply before you replace it. This section shows you how to troubleshoot and reseal the CAT1740, and how to replace it, if required (part number CAT1740).



Warning: Double pole, neutral fusing. Disconnect the CP950 mains power before proceeding. To reduce the risk of electrical shock, you must disconnect the power cord before removing the power supply assembly.

5.2.1 Tool Required

- Small Phillips screwdriver

To troubleshoot, reseal, and also replace the CAT1740 power supply, if necessary:

1. Power down the unit by disconnecting the power cord, and then disconnect all other connections.
2. Locate the CAT1740 power supply module on the rear panel.
3. Find the two screws that secure the power supply to the chassis.

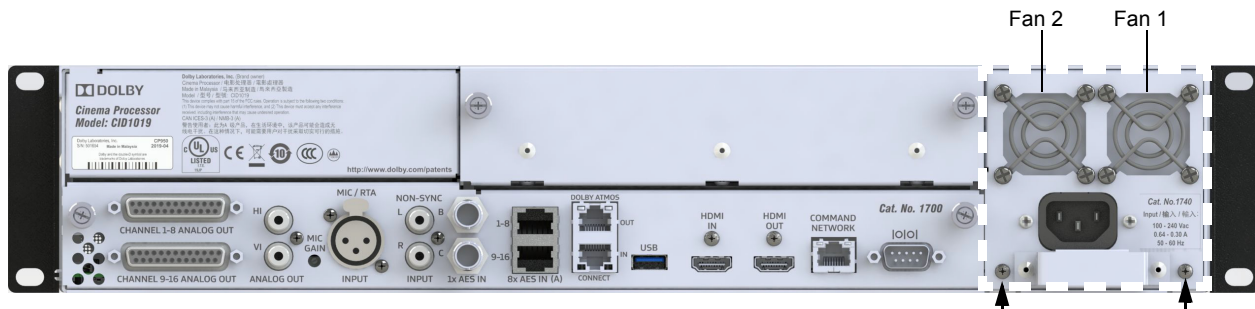


Figure 5-4 Rear-Panel Power Supply Module, Fan Locations, and Chassis Screws

4. Use a small Phillips screwdriver to remove the two screws that secure the power supply to the chassis.
5. Use the handle on the power supply to pull the power supply out of the chassis.

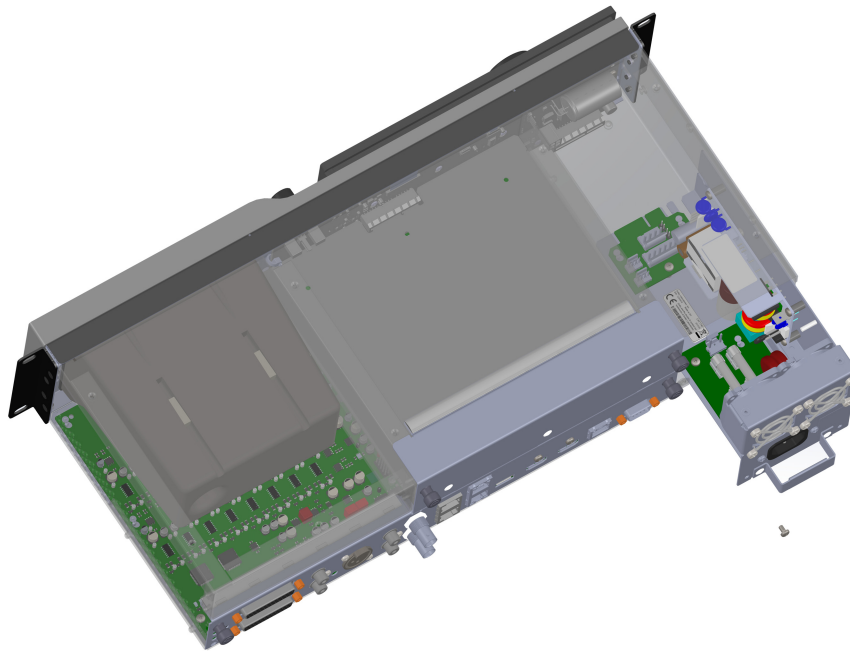


Figure 5-5 Power Supply Components

You can see several components in the CAT1740 power supply, as shown in the following figure.

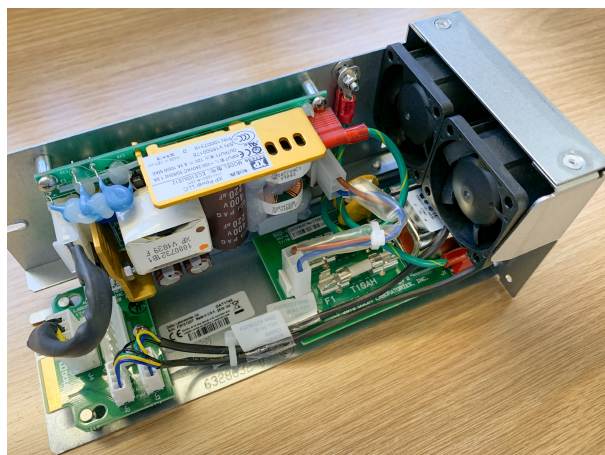


Figure 5-6 Power Supply Components

The power moves through the AC input into two fuses on the power supply. In the figures below, fuse 1 (F1), a 10-amp fuse, is closest to the front of the power supply. Fuse 2 (F2), a 2-amp fuse, is located behind fuse 1. Each fuse receptacle supports two fuse sizes, which makes it easier to purchase replacement fuses locally .

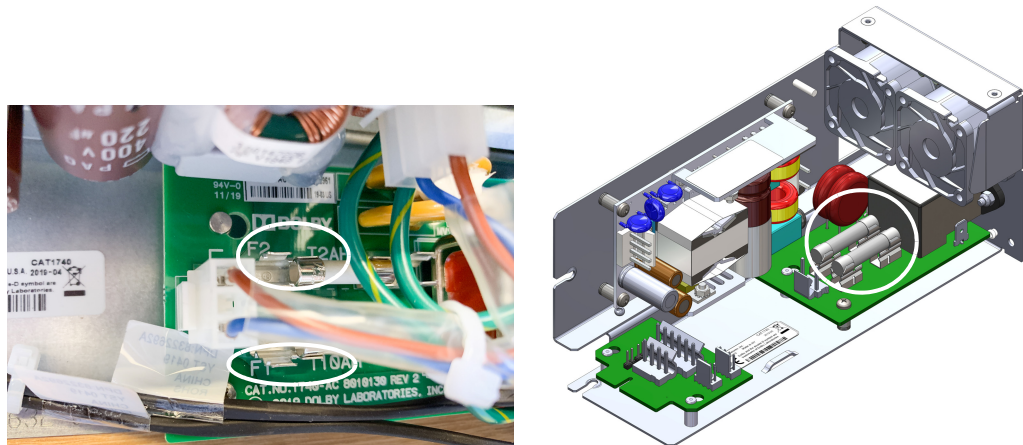


Figure 5-7 Power Supply Fuses

6. Determine whether either or both fuses failed. If you need to remove and replace fuses, we recommend that you use a fuse puller. Dolby does not sell fuses. For failed fuses, use these specifications to locate a suitable replacement locally:

Fuse	Rating	Type	Small Size	Large Size
Fuse 1	10 A 250 VAC	Ceramic time lag	5 × 20 mm	6.3 × 32 mm
Fuse 2	2 A 250 VAC	Ceramic time lag	5 × 20 mm	6.3 × 32 mm

7. If both fuses are good, look for disconnected cables or damaged components. After this inspection, reseal the power supply in the CP950, secure it with the two screws you removed, and reboot.

If the CP950 still does not boot up, the problem is most likely related to another power supply component. If you have more than one CP950, you can double-check a problem power supply by swapping CAT1740s between units.

If you need to replace a problem power supply, you can order a new CAT1740 from Dolby.

The procedure is now complete.

5.3 Troubleshooting and Replacing Fans

If the CP950 is overheating and you see system fan alerts, you should check the fans and replace as necessary. We recommend that you troubleshoot a fan problem before replacing. This section explains how to troubleshoot, remove, and replace CAT1740 fans (part number 8322692).

5.3.1 Tools Required

These tools are required for this procedure:

- Small Phillips screwdriver
- Small zip tie

5.3.2 Troubleshooting and Replacement Procedure

To troubleshoot and replace fans in a CAT1740 power supply:

1. Look at the fans on the rear panel to identify any fans that are not turning.
It is possible, but not likely, that power cycling the CP950 can restore fan operation.



Caution: Do not touch a spinning fan with your finger or any tools. The fans operate at a very high speed and can cause injury or damage.

2. Power down the unit by disconnecting the power cord, and then disconnect all other connections.
3. Locate the CAT1740 power supply module containing two fans on the rear panel. If the system sent a warning error message, you can identify each fan, as shown in the following figure.
4. Find the two screws that secure the power supply to the chassis.

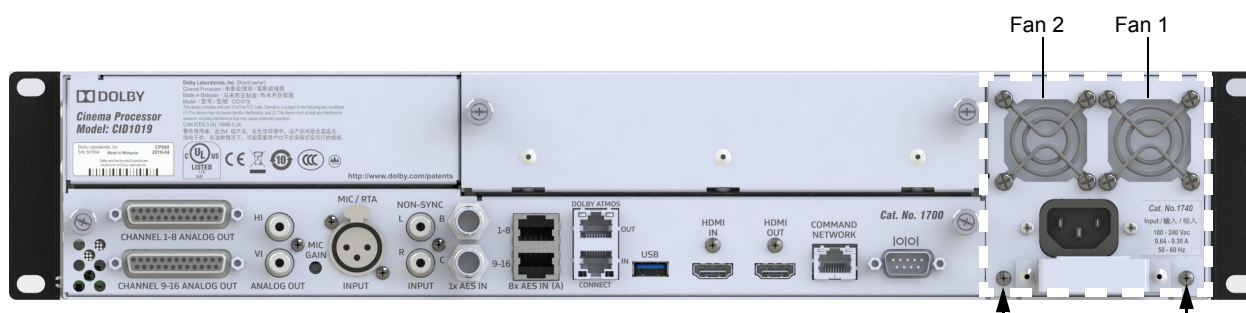


Figure 5-8 Rear-Panel Power Supply Module, Fan Locations, and Chassis Screws

5. Use a small Phillips screwdriver to remove the two screws that secure the power supply to the chassis.
6. Use the handle on the power supply to pull the power supply out of the chassis.
7. Check the connections for the fan wires.

The wires for the fans are plugged into a small circuit board labeled CAT1740-DC. The J3 connector is for fan 1. The J2 connector is for fan 2. Reseat the fan connections, then use a flashlight to check if the fan seized up due to obstructions. With the fan off, you can rotate it carefully to see if it is bound up. Do not touch the fan when it is spinning.

8. Reinstall the power supply in the CP950, then power up the system. If there is still a fan problem, you need to replace any faulty fans. Contact Dolby to order fan part number 8322692. If you are not comfortable replacing fans, you can order a new power supply, which is part number CAT1740.

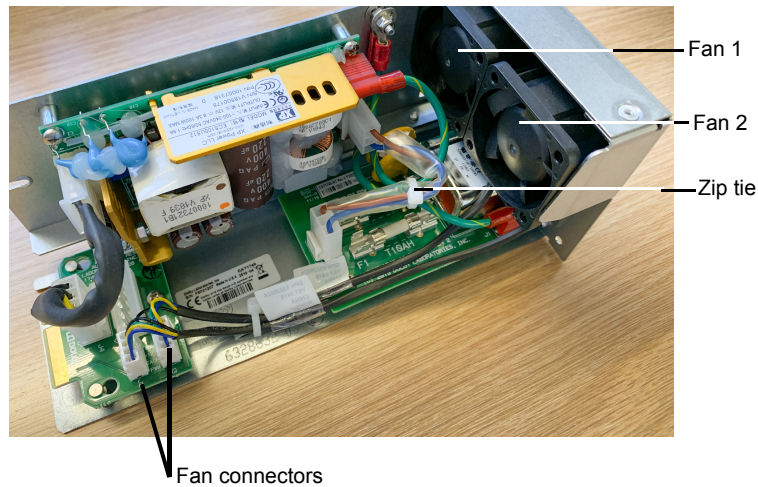


Figure 5-9 Fans and Connectors

The steps that follow show how to replace fan 2. The steps for replacing fan 1 are identical.

9. Disconnect the CAT1740 power cable from the power source.
10. Use a small Phillips screwdriver to remove the four screws that secure the fan to the CAT 1740 (shown partially unscrewed in the following figure).



Figure 5-10 Remove Screws From Fans

11. Locate and cut the zip tie around the fan cables (see zip tie in [Figure 5-9](#)).
12. Unplug the fan cable from the circuit board, then remove the fan.
13. Connect and install the replacement fan. Note that the fan label should be facing out and match the routing of the fan cables. Add a new zip tie to secure the cabling. If needed, you can order a new Dolby CAT1740 power supply.
14. The procedure is now complete.

5.4 Replacing the CAT1720 Front-Panel Assembly Board

If there is a problem with the front-panel user interface (FPUI) screen, fader knobs, or booth monitor, you should start troubleshooting by reseating the CAT1700 main board before replacing the CAT1720 board. This section shows you how to reseat the CAT1700 or replace the entire CAT1720 assembly, if necessary (part numbers CAT1700 and CAT1720).



Warning: To reduce the risk of electrical shock, you must disconnect the power cord before proceeding.

5.4.1 Required Tool

Small Phillips screwdriver

To troubleshoot or replace the CAT1720:

1. Power down the unit by disconnecting the power cord, and then disconnect all other connections.
2. Locate the CAT1700 and the two thumbscrews that secure the board to the chassis on the back of the CP950.

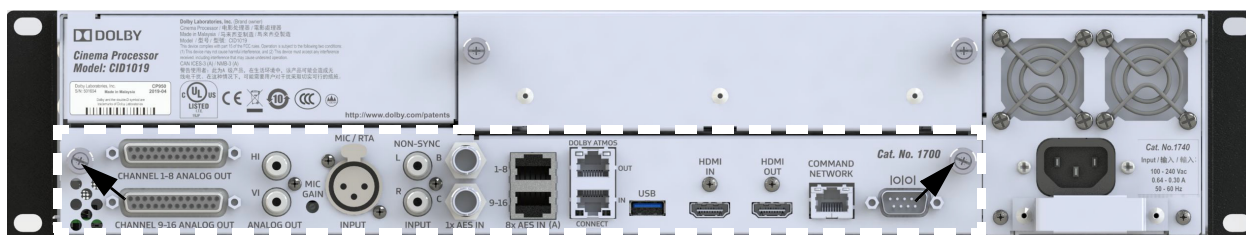


Figure 5-11 CAT1700 and Thumbscrews

3. Unscrew the thumbscrews in a counterclockwise direction. These screws are captured in the chassis and do not come out completely.
4. When the thumbscrews are no longer securing the CAT1700 to the chassis, carefully pull on the thumbscrews to remove the board.

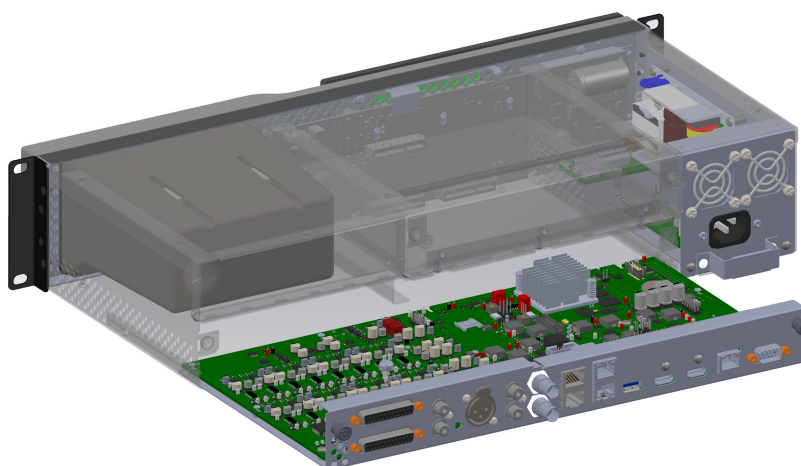


Figure 5-12 CAT1700 Removed

5. Inspect the CAT1700 for signs of damage to its components or the edge connector that plugs into the CAT1720. If there is damage, you need to replace the CAT1700.
6. To reseat or replace the existing CAT1700, align the circuit board with the guide rails on both sides. The CAT1700 sheet metal tray will slide into the unit below the guide rails.

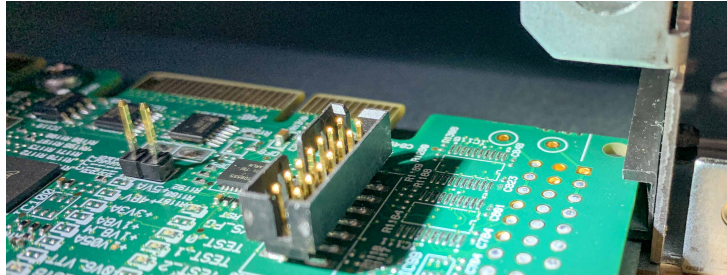


Figure 5-13 Align CAT1700 with Guide Rails

7. Push the CAT1700 carefully into its final position using the guide rails, and then use the thumbscrews to secure the board to the CP950 chassis.
8. If reseating or replacing the CAT1700 did not restore function, power down and remove the CAT1700 again.
9. Locate the CAT1740 power supply module on the back of the unit and identify the two screws that secure the power supply to the chassis. In addition, find the blank expansion-board cover plate and its two thumbscrews.



Warning: Double pole, neutral fusing. Disconnect mains before servicing.
To reduce the risk of electrical shock, you must disconnect the power cord before removing the power supply assembly.

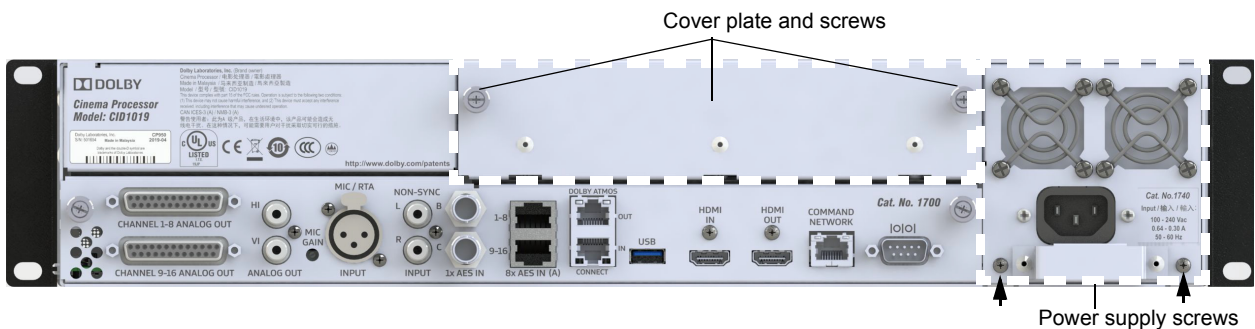


Figure 5-14 CAT1740 Power Supply Module and Chassis Screws

10. Use a small Phillips screwdriver to remove the two screws that secure the power supply to the chassis.
11. Use the handle on the power supply to pull the power supply out of the chassis.
12. Use the thumbscrews to remove the cover plate.

13. Remove the top and bottom screws that are located behind each rack ear on both sides of the unit. Do not remove the two middle screws.

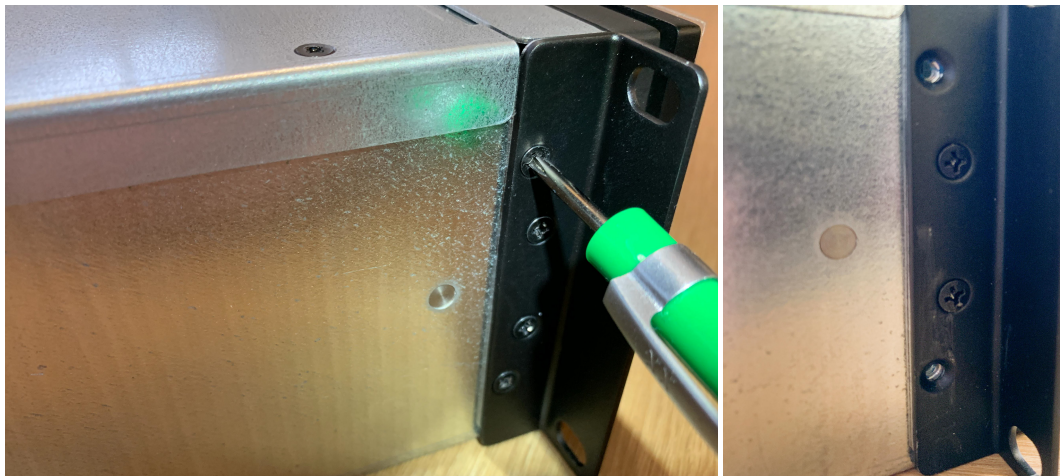


Figure 5-15 Remove Top and Bottom Screws Behind Rack Ears

14. Pull on the rack ears to remove the front panel straight out of the chassis.



Figure 5-16 Remove Front Panel from the Chassis

15. Check the CAT1720 circuit board for damage. If you had problems with the booth monitor speaker, check the connection on the left side of the board.

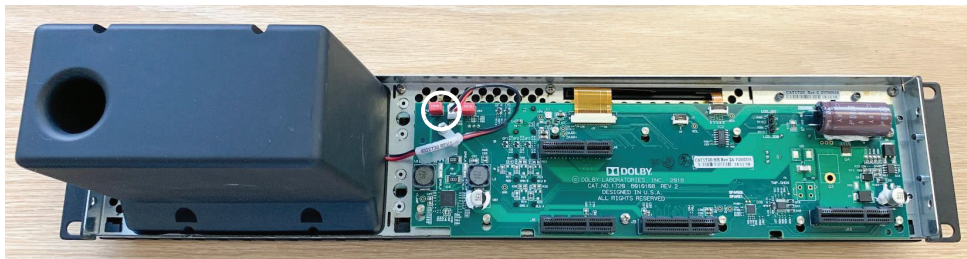


Figure 5-17 CAT1720 Circuit Board with Booth Monitor Speaker Connection Shown

16. Move the chassis so that the empty front-panel slot is facing up toward you.



Figure 5-18 Empty Front-Panel Slot

17. Hold the new front panel by the rack ears and level it as much as possible.
There are guiding slots on the chassis that match up with the front panel. When properly seated, the screw holes on the left and right sides behind the rack ears should match up.
18. Reinstall the screws behind the rack ears.
19. Reinstall the CAT1740 power supply in the unit, securing it with the two screws you previously removed.
20. Reinstall the CAT1700 main board in the chassis, securing it with the two thumbscrews.
21. Reinstall the expansion-board cover plate in the chassis, securing it with the two thumbscrews.
22. The procedure is now complete.

Pinouts for CP950 Connectors

This appendix provides pinout information for CP950 connectors.

A.1 CP950 HDMI Input and Output Pinouts

The CP950 has one HDMI™ input and one HDMI output. The HDMI input and output use type A connectors.

Pin	Description
1	Transition-minimalized differential signaling (TMDS) data 2 +
2	TMDS data 2 shield
3	TMDS data 2 –
4	TMDS data 1 +
5	TMDS data 1 shield
6	TMDS data 1 –
7	TMDS data 0 +
8	TMDS data 0 shield
9	TMDS data 0 –
10	TMDS clock +
11	TMDS clock shield
12	TMDS clock –
13	Consumer Electronics Control (CEC)
14	Reserved
15	Serial Clock for DDC (SCL)
16	Serial DataLine for DDC (SDA)
17	Display Data Channel /CEC ground (DDC)
18	+5 V power
19	Hot plug detect

A.2 CP950 16-Channel Analog Outputs

The CP950 has 16 electronically balanced, floating analog output channels with 100 Ω output impedance. The outputs are split between two 25-pin subminiature D-connectors (female). The maximum RMS output level for the analog output level is +26 dBu (15.45 V). The pinout conforms to the TASCAM® standard.

Following are the CP950 pinouts for analog output channels 1–8.

Pin	Description
1	Channel 8 +
2	Channel 8 ground
3	Channel 7 –
4	Channel 6 +
5	Channel 6 ground
6	Channel 5 –
7	Channel 4 +
8	Channel 4 ground
9	Channel 3 –
10	Channel 2 +
11	Channel 2 ground
12	Channel 1 –
13	Empty
14	Channel 8 –
15	Channel 7 +
16	Channel 7 ground
17	Channel 6 –
18	Channel 5 +
19	Channel 5 ground
20	Channel 4 –
21	Channel 3 +
22	Channel 3 ground
23	Channel 2 –
24	Channel 1 +
25	Channel 1 ground

Following are the CP950 pinouts for analog output channels 9–16.

Pin	Description
1	Channel 16 +
2	Channel 16 ground
3	Channel 15 –
4	Channel 14 +
5	Channel 14 ground
6	Channel 13 –
7	Channel 12 +
8	Channel 12 ground
9	Channel 11 –
10	Channel 10 +
11	Channel 10 ground
12	Channel 9 –
13	Empty
14	Channel 16 –
15	Channel 15 +
16	Channel 15 ground
17	Channel 14 –
18	Channel 13 +
19	Channel 13 ground
20	Channel 12 –
21	Channel 11 +
22	Channel 11 ground
23	Channel 10 –
24	Channel 9 +
25	Channel 9 ground

A.3 CP950 Serial Port Pinouts

The CP950 has one RS-232 serial port. It uses a D-subminiature DE-9 data terminal equipment (DTE) male connector. Use a crossover cable to communicate with another DTE device, such as a PC. The equipment connected to this port should have its serial port set to 9,600 baud, no parity, one stop bit.

Pin	Description
1	Data Carrier Detect (DCD)
2	Received Exchange Data (RXD)
3	Transmit Exchange Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)

Pinouts for Dolby Servers with DB25 Audio Output

This appendix provides pinout information for Dolby® servers that use DB25 audio output.

B.1 DSS200 with CAT862 Media Block 8 × AES Output Pinouts

Pin	Description
1	AES Common
2	Channels 1/2 –
3	Channels 3/4 +
4	AES Common
5	Channels 5/6 –
6	Channels 7/8 +
7	AES Common
8	Channels 9/10 +
9	AES Common
10	Channels 11/12 –
11	Channels 13/14 +
12	AES Common
13	Channels 15/16 –
14	Channels 1/2 +
15	AES Common
16	Channels 3/4 –
17	Channels 5/6 +
18	AES Common
19	Channels 7/8 –
20	AES Common
21	Channels 9/10 –
22	Channels 11/12 +
23	AES Common
24	Channels 13/14 –
25	Channels 15/16 +

B.2 DCP-2000 and DCP-2K4 Dolphin Media Block 8 × AES Output Pinouts

Pin	Description
1	Channels 15/16 +
2	Channels 15/16 ground
3	Channels 13/14 –
4	Channels 11/12 +
5	Channels 11/12 ground
6	Channels 9/10 –
7	Channels 7/8 +
8	Channels 7/8 ground
9	Channels 5/6 –
10	Channels 3/4 +
11	Channels 3/4 ground
12	Channels 1/2 –
13	No connection
14	Channels 15/16 –
15	Channels 13/14 +
16	Channels 13/14 ground
17	Channels 11/12 –
18	Channels 9/10 +
19	Channels 9/10 ground
20	Channels 7/8 –
21	Channels 5/6 +
22	Channels 5/6 ground
23	Channels 3/4 –
24	Channels 1/2 +
25	Channels 1/2 ground

DB25-to-RJ45 Adapter Instructions

C.1 DB25/RJ45 Adapter Wiring Instructions

This section provides instructions for wiring the provided DB25-to-dual-RJ45 adapter for Dolby® Digital cinema playback systems that output 16-channel audio via a DB25 connector. Instructions are provided for the Dolby DSS200 (equipped with a CAT862 media block), and the Dolby DCP2000 and DCP2K4 (equipped with a Dolphin media block).



Note: Dolby DSS playback systems provide two media block options, the CAT862 and CAT745. The CAT745 option outputs 16-channel audio via RJ45 Ethernet connections and does not require an adapter.

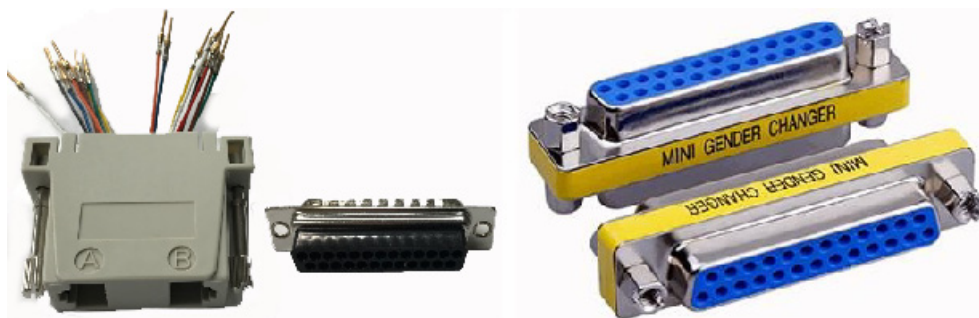


Warning: To avoid exposure to dangerous voltages and to avoid damage to the unit, do not connect the rear-panel RJ45 ports to telephone circuits.

C.1.1 Required Parts

These parts are required:

- An unpinned male DB25-to-dual-RJ45 adapter. One adapter ships with the CP950 (Dolby part number 7501670).
- For DSS200 CAT862 configurations only: A female-to-female DB25 gender changer. This gender changer is not provided with the CP950. You must obtain it from a third-party vendor.



- In addition, you need two CAT5e or greater Ethernet cables. One of these cables is required for channels 1–8, and a second cable is required when using channels 9–16.

C.1.2 Wiring the DB25-to-Dual-RJ45 Adapter

You must use the correct pinouts on the provided DB25-to-RJ45 adapter to transmit the incoming audio channels from the playback system to the CP950.

To wire the adapter for your playback system, you need to connect its colored wires to the correct numbered pinholes, as specified in the following tables. The pinouts for the DSS200 CAT862 are different than those for the DCP2000 and DCP2K4, so the adapter wiring pinouts are also different. Be sure to use the correct table. Insert the specified wire into its corresponding pin hole until you feel the pin latch.

DSS200 CAT862 Port-A Adapter Pinouts for Channels 1–8

RJ45 Port-A Wire Color	Pin Hole Number	AES Pair
Blue	14	Channels 1 and 2 +
Orange	2	Channels 1 and 2 –
Black	3	Channels 3 and 4 +
Red	17	Channels 5 and 6 +
Green	5	Channels 5 and 6 –
Yellow	16	Channels 3 and 4 –
Brown	6	Channels 7 and 8 +
White	19	Channels 7 and 8 –

DSS200 CAT862 Port-B Adapter Pinouts for Channels 9–16

RJ45 Port-B Wire Color	Pin Hole Number	AES Pair
Blue	8	Channels 9 and 10 +
Orange	21	Channels 9 and 10 –
Black	22	Channels 11 and 12 +
Red	11	Channels 13 and 14 +
Green	24	Channels 13 and 14 –
Yellow	10	Channels 11 and 12 –
Brown	25	Channels 15 and 16 +
White	13	Channels 15 and 16 –

DCP2000 and DCP2K4 Port-A Adapter Pinouts for Channels 1–8

RJ45 Port-A Wire Color	Pin Hole Number	AES Pair
Blue	24	Channels 1 and 2 +
Orange	12	Channels 1 and 2 –
Black	10	Channels 3 and 4 +
Red	21	Channels 5 and 6 +
Green	9	Channels 5 and 6 –
Yellow	23	Channels 3 and 4 –
Brown	7	Channels 7 and 8 +
White	20	Channels 7 and 8 –

DCP2000 and DCP2K4 Port-B Adapter Pinouts for Channels 9–16

RJ45 Port-B Wire Color	Pin Hole Number	AES Pair
Blue	18	Channels 9 and 10 +
Orange	6	Channels 9 and 10 –
Black	4	Channels 11 and 12 +
Red	15	Channels 13 and 14 +
Green	3	Channels 13 and 14 –
Yellow	17	Channels 11 and 12 –
Brown	1	Channels 15 and 16 +
White	14	Channels 15 and 16 –

For detailed instructions on how to connect the ports between a CP950 and each digital cinema playback system, see [Section 2.4](#).

Cabling Changes Required when Replacing a CP750

This appendix describes the cabling changes required when replacing a CP750 with a CP950.

The pinout on the CP750 **Main Audio Output** is different from the pinout on the CP950 **Channel 1-8 Analog Out**. The CP750 uses its own unique pinout, but the CP950 pinout conforms to the TASCAM® standard. The DB25 connector is male on the CP750 and female on the CP950.

When replacing a CP750 with a CP950, there are three wiring-change options:

- Changing the CP750 wiring to use a male connector
- Removing the CP750 wiring and installing a new cable
- Plugging a short adapter cable or DB25-DB25 adapter into the end of the CP750 wiring

The required wiring pinouts are shown in the following table.

CP750 Cable Pin # (must be male)	CP950 Cable Pin # (must be male)	Channel
1	2	Ground
2	24	L+
3	3	BsL
4	5	Ground
5	21	C+
6	14	BsR
7	8	Ground
8	10	R+
9	11	Ground
10	6	Ls-
11	17	Rs-
12	20	SW-
13	13	Ground
14	12	L-
15	16	Ground
16	15	BsL+
17	9	C-
18	19	Ground

CP750 Cable Pin # (must be male)	CP950 Cable Pin # (must be male)	Channel
19	1	BsR+
20	23	R-
21	22	Ground
22	25	Ground
23	18	Ls+
24	4	Rs+
25	7	SW+

Remote Control, Monitoring, and Automation

The Dolby® CP950 provides several ways to control and monitor the system:

- Web services API, as described in [Section E.1](#)
- ASCII commands, as described in [Section E.2](#)
- Simple Network Management Protocol (SNMP), as described in [Section E.3](#)

E.1 Web Services API

There is a web services API provided for the CP950. For details, go to <https://www.dolbycustomer.com>. In addition, you can access web services by selecting **downloads** in the CP950 web client.

E.2 ASCII Serial Commands

The CP950 can receive simple ASCII commands over the RS232 serial port or Ethernet (port 61408). The following table lists the CP950 ASCII commands.

Table E-1 CP950 Serial Commands

Parameter Name	Description	Argument/Value	Usage
<code>sys.macros</code>	Read list of macro names and numbers	?	"sys.macros ?"
<code>sys.macro_preset</code>	Read current macro number	?	"sys.macro_preset ?"
	Change to a macro by number (Activates the third macro as mapped in macro editor)	Integer (1–8)	"sys.macro_preset 3"
<code>sys.macro_name</code>	Read current macro name	?	"sys.macro_name ?"
	Change to a macro by name (Activates the non-sync macro)	<macro name>	"sys.macro_name non-sync"
	Change to a macro by name (Activates the HDMI macro)	<macro name>	"sys.macro_name hdmi"
<code>sys.fader</code>	Read current fader level (Represented as Dolby fader level 0–100; default 70)	?	"sys.fader ?"
	Set a new fader level (Sets fader to 7.0)	Integer (1-100)	"sys.fader 70"
	Set a new fader level (Sets fader to 5.5)	Integer (1-100)	"sys.fader 55"

Table E-1 CP950 Serial Commands (continued)

Parameter Name	Description	Argument/Value	Usage
sys.fader_delta	Increase current fader level (Increases fader level by 0.1)	(Integer 1-100)	"control_fader_delta .1"
	Decrease current fader level (Decreases fader level by 0.1)	(Integer 1-100)	"control_fader_delta -.1"
	Increase current fader level (Increases fader level by 0.5)	(Integer 1-100)	"control_fader_delta .5"
sys.mute	Read current mute state ("0" = unmuted; 1 = muted)	?	"sys.mute ?"
	Mute system	1	"sys.mute 1"
	Unmute system	0	"sys.mute 0"
sys.ip_settings	Read CP950 IP address	?	"sys.ip_settings ?"

E.3 Simple Network Management Protocol

Simple Network Management Protocol (SNMP) allows you to monitor different CP950 operational functions. However, you cannot use SNMP to change settings or configurations. You can download SNMP Management Information Base (MIB) files by clicking **downloads** in the navigation bar.

These are the CP950 SNMP variables:

- cp950FaderLevel.
- cp950MuteStatus.0
- cp950DigitalOutputMode.0
- cp950BitstreamFormat.0
- cp950AESSyncState.0
- cp950DecodeMode.0
- cp950InputSelection.0
- cp950AudioDelay.0
- cp950MeterLevels.0