



Dolby Cinema Processor CP950 Manual

2 December 2019
Issue 6

Notices

Copyright

© 2019 Dolby Laboratories. All rights reserved.

Dolby Laboratories, Inc.

1275 Market Street
San Francisco, CA 94103-1410 USA
Telephone 415-558-0200
Fax 415-645-4000
<http://www.dolby.com>

Trademarks

Dolby and the double-D symbol are registered trademarks of Dolby Laboratories.

The following are trademarks of Dolby Laboratories:

Dialogue Intelligence™	Dolby Theatre®
Dolby®	Dolby Vision™
Dolby Advanced Audio™	Dolby Voice®
Dolby Atmos®	Feel Every Dimension™
Dolby Audio™	Feel Every Dimension in Dolby™
Dolby Cinema™	Feel Every Dimension in Dolby Atmos™
Dolby Digital Plus™	MLP Lossless™
Dolby Digital Plus Advanced Audio™	Pro Logic®
Dolby Digital Plus Home Theater™	Surround EX™
Dolby Home Theater®	

All other trademarks remain the property of their respective owners.

Patents

THIS PRODUCT MAY BE PROTECTED BY PATENTS AND PENDING PATENT APPLICATIONS IN THE UNITED STATES AND ELSEWHERE. FOR MORE INFORMATION, INCLUDING A SPECIFIC LIST OF PATENTS PROTECTING THIS PRODUCT, PLEASE VISIT <http://www.dolby.com/patents>.

PRODUCT MODEL

THIS DOCUMENTATION APPLIES TO MODEL CID1019.

LIMITED WARRANTY

DOLBY WARRANTS TO THE ORIGINAL PURCHASER ONLY, THAT THE PRODUCT WILL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER NORMAL CONSUMER USE FOR THE GREATER OF 3 YEARS, OR THE MINIMUM PERIOD REQUIRED UNDER LOCAL LAW, COMMENCING UPON THE DATE OF ORIGINAL RETAIL PURCHASE (THE "WARRANTY PERIOD"). THIS EXPRESS WARRANTY IS NON-TRANSFERABLE.

DOLBY'S SOLE LIABILITY, AND YOUR SOLE REMEDY, FOR DOLBY'S BREACH OF THE FOREGOING WARRANTY DURING THE WARRANTY PERIOD WILL BE, AT DOLBY'S SOLE DISCRETION, TO REPAIR OR REPLACE THE DEFECTIVE PRODUCT. THE FOREGOING IS YOUR SOLE AND EXCLUSIVE REMEDY FOR DOLBY'S BREACH OF THE WARRANTY HEREIN OR FOR ANY OTHER CLAIMS RELATED TO THIS WARRANTY.

WARRANTY EXCLUSIONS

THIS LIMITED WARRANTY DOES NOT COVER DAMAGE OR MALFUNCTIONS CAUSED BY ACCIDENT, DISASTER, MISUSE (INCLUDING ANY USE IN A MANNER CONTRARY TO THE INSTRUCTIONS CONTAINED IN ANY USER GUIDE OR ON THE PACKAGING OF THE PRODUCT), ABUSE, NEGLIGENCE OR OTHER EXTERNAL CAUSES; POWER SURGES; IMPROPER INSTALLATION; THIRD-PARTY PRODUCTS; UNAUTHORIZED OPENING, USE, SERVICE, TAMPERING, ALTERATION, REPAIR OR MODIFICATION; OR INADEQUATE PACKING OR SHIPPING PROCEDURES. THIS LIMITED WARRANTY ALSO DOES NOT COVER COSMETIC DAMAGE OR ISSUES INCIDENT TO NORMAL WEAR AND TEAR.

WARRANTY CLAIMS

IN ORDER TO MAKE A WARRANTY CLAIM, YOU MUST CONTACT cinemasupport@dolby.com DURING THE WARRANTY PERIOD. A CINEMA SUPPORT REPRESENTATIVE WILL DETERMINE WHETHER THE PURPORTED DEFECT IS COVERED UNDER THE WARRANTY. IF COVERED, CINEMA SUPPORT WILL PROVIDE YOU DETAILED INFORMATION ON HOW AND WHERE TO SEND YOUR DEFECTIVE PRODUCT. FAILURE TO FOLLOW THE REPAIR RETURN INSTRUCTIONS MAY VOID YOUR WARRANTY.

DISCLAIMER OF WARRANTIES

EQUIPMENT MANUFACTURED BY DOLBY LABORATORIES IS WARRANTED AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF THREE YEARS FROM THE DATE OF PURCHASE. THERE ARE NO OTHER EXPRESS OR IMPLIED WARRANTIES AND NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR OF NONINFRINGEMENT OF THIRD-PARTY RIGHTS (INCLUDING, BUT NOT LIMITED TO, COPYRIGHT AND PATENT RIGHTS).

LIMITATION OF LIABILITY

IT IS UNDERSTOOD AND AGREED THAT DOLBY LABORATORIES' LIABILITY, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, IN NEGLIGENCE, OR OTHERWISE, SHALL NOT EXCEED THE COST OF REPAIR OR REPLACEMENT OF THE DEFECTIVE COMPONENTS OR ACCUSED INFRINGING DEVICES, AND UNDER NO CIRCUMSTANCES SHALL DOLBY LABORATORIES BE LIABLE FOR INCIDENTAL, SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, DAMAGE TO SOFTWARE OR RECORDED AUDIO OR VISUAL MATERIAL), COST OF DEFENSE, OR LOSS OF USE, REVENUE, OR PROFIT, EVEN IF DOLBY LABORATORIES OR ITS AGENTS HAVE BEEN ADVISED, ORALLY OR IN WRITING, OF THE POSSIBILITY OF SUCH DAMAGES.

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 2000m 以下地区安全使用。

Korea

이 기기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Important safety instructions

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

⚠ DANGER: 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.

⚠ DANGER: Do not use this apparatus near water.

⚠ DANGER: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

⚠ CAUTION: Clean only with dry cloth.

⚠ CAUTION: Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

⚠ CAUTION: No naked flame sources, such as lighted candles, should be placed on the apparatus.

⚠ CAUTION: Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

⚠ CAUTION: Only use attachments/accessories specified by the manufacturer.

- ⚠ CAUTION:** Unplug this apparatus when unused for long periods of time.
- ⚠ CAUTION:** Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- ⚠ CAUTION:** Do not expose the apparatus to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
- ⚠ DANGER:** 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.
- ⚠ CAUTION:** 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.
- ⚠ 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.
- ⚠ DANGER:** In order to reduce the risk of electrical shock, the power cord must be disconnected when the power supply assembly is removed.
- ⚠ CAUTION:** 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.
- ⚠ 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.
- ⚠ DANGER:** To avoid exposure to dangerous voltages and to avoid damage to the unit, do not connect the rear-panel Ethernet port to telephone circuits.
- ⚠ CAUTION:** 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.
- ⚠ 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, which is located on this page these safety instructions.
- ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebut les batteries usagées selon les instructions.

⚠ CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type. Dispose of used batteries according to local law.

⚠ DANGER:  N

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

	<p>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:</p> <p>http://www.dolby.com/environment</p>
---	---

Safety notices

These important safety notices are provided in English, French, German, Italian, Spanish, Swedish, and Dutch.

Important safety notices

	<p>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:</p> <ul style="list-style-type: none"> • Ensure that your mains supply is in the correct range for the input power requirement of the unit. • Ensure fuses fitted are the correct rating and type as marked on the unit. • The unit must be earthed by connecting to a correctly wired and earthed power outlet. • The power cord supplied with this unit must be wired as follows: <ul style="list-style-type: none"> • Live-Brown • Neutral-Blue • Earth-Green/Yellow
---	--

IMPORTANT – NOTE DE SECURITE

	<p>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, veillez à ob les recommandations suivantes:</p> <ul style="list-style-type: none"> • Le selecteur de tension doit être placé sur la valeur correspondante à votre alimentation réseau. • Les fusibles doivent correspondre à la valeur indiquée sur le materiel. • Le materiel doit être correctement relié à la terre. • Le cordon secteur livré avec le materiel doit être câblé de la manière suivante: <ul style="list-style-type: none"> • Phase-Brun • Neutre-Bleu • Terre-Vert/Jaune
---	--

WICHTIGER SICHERHEITSHINWEIS

D	<p>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:</p> <ul style="list-style-type: none"> • Der Spannungswähler muß auf Ihre Netzspannung eingestellt sein. • Die Sicherungen müssen in Typ und Stromwert mit den Angaben auf dem Gerät übereinstimmen. • Die Erdung des Gerätes muß über eine geerdete Steckdose gewährleistet sein. • Das mitgelieferte Netzkabel muß wie folgt verdrahtet werden: <ul style="list-style-type: none"> • Phase-braun • Nulleiter-blau • Erde-grün/gelb
---	---

NORME DI SICUREZZA – IMPORTANTE

I	<p>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:</p> <ul style="list-style-type: none"> • Assicurarsi che il selettore di cambio tensione sia posizionato sul valore corretto. • Assicurarsi che la portata ed il tipo di fusibili siano quelli prescritti dalla casa costruttrice. • L'apparecchiatura deve avere un collegamento di messa a terra ben eseguito; anche la connessione rete deve avere un collegamento a terra. • Il cavo di alimentazione a corredo dell'apparecchiatura deve essere collegato come segue: <ul style="list-style-type: none"> • Filo tensione-Marrone • Neutro-Blu • Massa-Verde/Giallo
---	---

AVISO IMPORTANTE DE SEGURIDAD

E	<p>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:</p> <ul style="list-style-type: none"> • Asegúrese que el selector de tensión esté ajustado a la tensión correcta para su alimentación. • Asegúrese que los fusibles colocados son del tipo y valor correctos, tal como se marca en la unidad. • La unidad debe ser puesta a tierra, conectándola a un conector de red correctamente cableado y puesto a tierra. • El cable de red suministrado con esta unidad, debe ser cableado como sigue: <ul style="list-style-type: none"> • Vivo-Marrón • Neutro-Azul • Tierra-Verde/Amarillo
---	---

VIKTIGA SÄKERHETSÅTGÄRDER!

	<p>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:</p> <ul style="list-style-type: none">• Kontrollera att spänningsväljaren är inställd på korrekt nätspänning.• Kontrollera att säkringarna är av rätt typ och för rätt strömstyrka så som anvisningarna på enheten föreskriver.• Enheten måste vara jordad genom anslutning till ett korrekt kopplat och jordat el-uttag.• El-sladden som medföljer denna enhet måste kopplas enligt följande:<ul style="list-style-type: none">• Fas-Brun• Neutral-Blå• Jord-Grön/Gul
---	--

BELANGRIJK VEILIGHEIDS-VOORSCHRIFT:

	<p>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:</p> <ul style="list-style-type: none">• Controleer of de spanningscarroussel op het juiste Voltage staat.• Gebruik alleen zekeringen van de aangegeven typen en waarden.• Aansluiting van de unit alleen aan een geaarde wandcontactdoos.• De netkabel die met de unit wordt geleverd, moet als volgt worden aangesloten:<ul style="list-style-type: none">• Fase-Bruin• Nul-Blauw• Aarde-Groen/Geel
---	---

Contents

1 Introduction to the Dolby Cinema Processor CP950.....	12
1.1 About this documentation.....	13
1.2 Dolby CP950 front panel.....	14
1.2.1 Front panel UI touch screen.....	14
1.2.2 Main volume (fader) knob.....	17
1.2.3 Booth monitor speaker.....	17
1.2.4 Booth Monitor speaker volume.....	17
1.2.5 Status indicator LEDs.....	17
1.3 Dolby CP950 rear panel.....	18
1.3.1 CAT1700 input and output components.....	18
1.3.2 CAT1740 AC input.....	20
1.4 Contacting Dolby	21
2 Installing the Dolby CP950 in a Dolby Digital Cinema network.....	22
2.1 Dolby CP950 packing kit.....	23
2.2 Mounting the Dolby CP950.....	23
2.3 Mains Power wiring.....	24
2.4 Connecting cables.....	24
2.5 Dolby CP950 wiring diagram.....	25
2.6 Connecting the Dolby CP950 to the auditorium (command) network.....	25
2.7 Connecting the Dolby CP950 to a Dolby Digital Cinema playback system.....	26
2.7.1 Connecting an IMS or IMB to the Dolby CP950.....	26
2.7.2 Connecting a Dolby DSS200 to the Dolby CP950.....	27
2.7.3 Connecting a Dolby DCP-2000 to the Dolby CP950.....	27
2.7.4 Connecting a Dolby DCP-2K4 to the Dolby CP950.....	28
2.8 Connecting amplifiers.....	28
2.9 Updating and configuring the playback system.....	29
2.10 Starting up the Dolby CP950.....	29
2.11 Configuring the network settings.....	29
2.12 Performing USB functions.....	31
3 Working with the web client user interface.....	32
3.1 Connecting to the Dolby CP950.....	33
3.1.1 Navigation sidebar.....	34
3.1.2 Active macro field.....	34
3.1.3 Monitor mix field.....	35
3.1.4 Fader field.....	35
3.1.5 Mute button.....	35
3.1.6 Input status display color indicators.....	36
3.1.7 Audio meter.....	36
3.1.8 Alerts.....	36
3.1.9 Site information and location.....	37
3.1.10 User.....	38

3.1.11 Info.....	38
3.2 Configuring macros.....	38
3.2.1 Creating or editing a macro.....	40
3.2.2 Selecting a macro.....	41
3.2.3 Deleting a macro.....	41
3.2.4 Macro order.....	41
3.2.5 Fader preset.....	41
3.2.6 Global audio delay.....	42
3.2.7 Analog output selection.....	42
3.2.8 Override HI/VI delay.....	43
3.2.9 Input.....	43
3.2.10 Format.....	44
3.2.11 Channel assignment.....	44
3.2.12 Surround processing.....	45
3.2.13 EQ preset.....	46
3.3 Displaying the equalization screen.....	46
3.3.1 Fine tuning with the Grossman eq.....	51
3.4 Displaying the auditorium parameters.....	52
3.4.1 Configuring a room.....	54
3.4.2 Displaying the routing configuration.....	55
3.4.3 Configuring array delays.....	56
3.5 Configuring preferences.....	57
3.6 Viewing and downloading the system logs.....	59
3.7 Setting up user access.....	61
3.8 Modifying the network settings.....	63
3.9 Performing maintenance tasks.....	66
3.9.1 Upgrading the Dolby CP950 system software.....	67
3.9.2 Backing up system settings.....	67
3.9.3 Restoring system settings.....	68
3.9.4 Resetting the system settings.....	68
3.10 Rebooting the system.....	68
3.11 Downloading CP950 essentials.....	69
3.12 Contacting Dolby support.....	70
4 Configuring the equalization parameters.....	71
4.1 Configuring equalization with the Dolby CP950 Real-Time Analyzer.....	72
4.1.1 Configuring a room.....	72
4.1.2 Configuring a digital output.....	75
4.1.3 Using the Internal or External Real Time Analyzer.....	75
4.1.4 Fine tuning with the Grossman eq.....	82
4.1.5 Configuring the macro editor.....	84
4.1.6 Finalizing the equalization.....	84
4.2 Using Dolby Atmos Designer and one-third octave EQ.....	85
4.2.1 Creating a room in Dolby Atmos Designer.....	86
4.2.2 Configuring a digital output.....	86
4.2.3 Using the Internal or External Real Time Analyzer.....	87
4.2.4 Fine tuning with the Grossman eq.....	94

4.2.5	Configuring the macro editor.....	96
4.2.6	Finalizing the equalization.....	96
4.3	Configuring a room using Dolby Atmos Designer and AutoEQ.....	97
4.3.1	Configuring a digital output.....	97
4.3.2	Creating a room in Dolby Atmos Designer and running AutoEQ.....	98
4.3.3	Configuring the macro editor.....	99
4.3.4	Finalizing the equalization.....	99
5	Servicing the Dolby CP950.....	101
5.1	Reseating or replacing the CAT1700 main board.....	102
5.1.1	Reseating or replacing the CAT1700 main board.....	102
5.2	Replacing the CAT1740 power supply.....	103
5.2.1	Required tool.....	103
5.2.2	Troubleshooting, reseating, or replacing the CAT1740 power supply	103
5.3	Troubleshooting and replacing fans.....	105
5.3.1	Required tools	105
5.3.2	Troubleshooting and replacing fans.....	105
5.4	Replacing the CAT1720 front-panel assembly board.....	107
5.4.1	Required tool.....	107
5.4.2	Troubleshooting and replacing the CAT1720.....	107
6	Pinouts for Dolby CP950 connectors.....	111
6.1	Dolby CP950 HDMI input and output pinouts.....	112
6.2	Dolby CP950 16-Channel analog outputs.....	112
6.3	Dolby CP950 serial port pinouts.....	115
6.4	Dolby CP950 RJ45 AES3 pinouts.....	115
7	Pinouts for Dolby servers with DB25 audio output.....	117
7.1	Dolby DSS200 with CAT862 MB 8 x AES output pinouts.....	118
7.2	Dolby DCP-2000 and Dolby DCP-2K4 Dolphin MB 8 x AES output pinouts.....	118
8	Wiring the DB25/RJ45 adapter.....	120
8.1	Required parts.....	121
8.2	Using the correct pinouts for the DB25-to-Dual-RJ45 adapter.....	121
9	Required cabling changes when replacing a Dolby CP750.....	123
9.1	Cabling changes required when replacing a Dolby CP750.....	124
9.2	Pinout information for replacing a CP950 with a CP750	124
10	Remote control, monitoring, and automation.....	126
10.1	Web services API.....	127
10.2	ASCII serial commands.....	129
10.3	Simple network management protocol.....	130

1

Introduction to the Dolby Cinema Processor CP950

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

- [About this documentation](#)
- [Dolby CP950 front panel](#)
- [Dolby CP950 rear panel](#)
- [Contacting Dolby](#)

1.1 About this documentation

This documentation shows you how to install and operate a Dolby CP950.

With the Dolby 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
- Compatible third-party servers

The Dolby CP950 provides the following audio input connectors:

- 8 × Audio Engineering Society (AES) 16 channel digital AES3 audio input
- HDMI input and repeater output
- Stereo nonsync inputs (RCA)
- Microphone input (XLR)
- Two 1 × AES BNC input connectors

The Dolby 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 (HI) and visually impaired (VI) analog output channels (RCA)

The Dolby CP950 Ethernet port supports IPv4. You can use this port for automation and control 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. Ethernet supports web Services and American Standard Code for Information Interchange (ASCII) commands. The RS232 serial interface also supports ASCII commands.

You can configure the Dolby 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 Dolby CP950 utilizes high-resolution multiple-rate equalization (EQ) for all channels. You can perform the setup manually using the Dolby CP950 web client user interface (UI) through the standard one-third octave EQ. Advanced users can run the automatic EQ process in Dolby Atmos Designer (DAD) v3.2.10 or later software. You can download the current version of DAD software by clicking **downloads** in the Dolby 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.

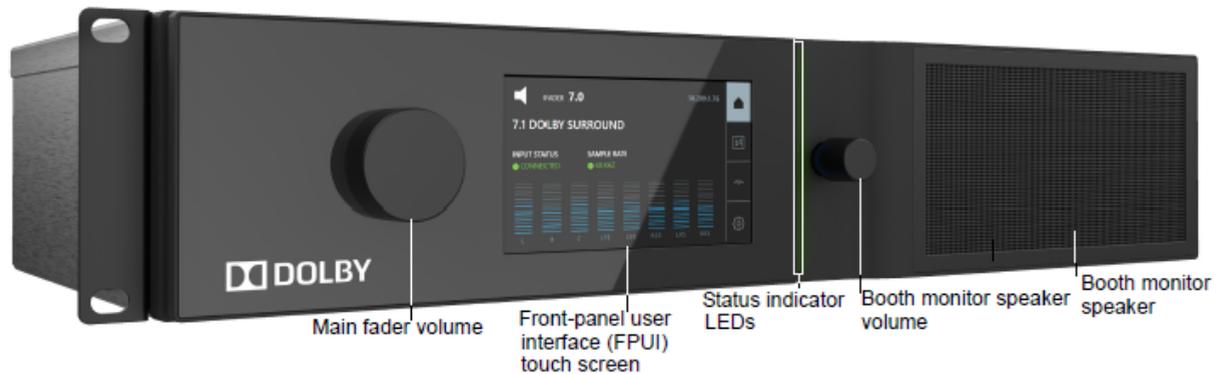
You can back up Dolby CP950 settings to a PC and restore the backup to another Dolby CP950 if you experience a hardware or software failure. This minimizes the need for additional calibration after repairs or unit replacement.

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

1.2 Dolby CP950 front panel

The Dolby CP950 front-panel provides a touch-screen user interface (FPUI) and other components that enable you to perform certain functions.

Figure 1: Dolby CP950 Front panel

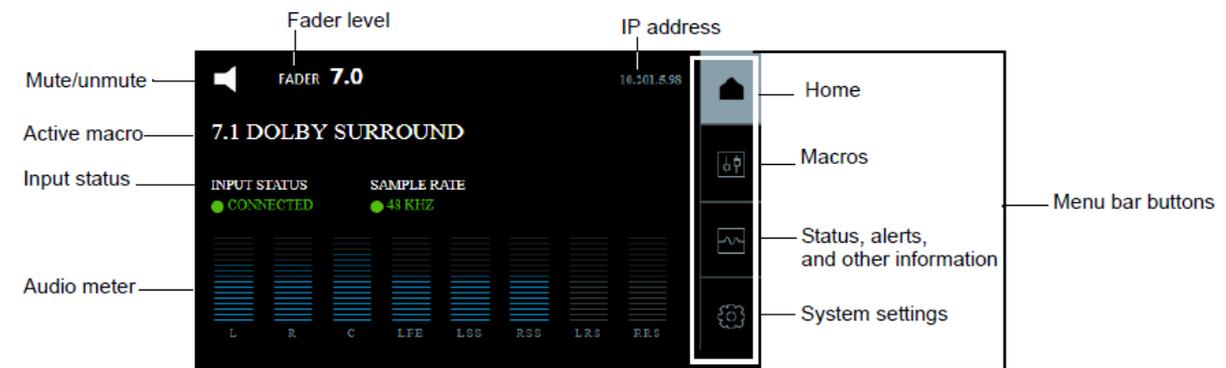


1.2.1 Front panel UI touch screen

Pressing soft buttons on this front-panel user interface (UI) touch screen (FPUI) 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 2: FPUI home screen



Note: You can remove the IP address from this screen through a setting in the web client **preferences** screen, as described in Section 3.5.

Input status display

If the currently active macro specifies AES3 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. If the signal is currently bad, the indicator is red. If the signal returns, the indicator is 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).

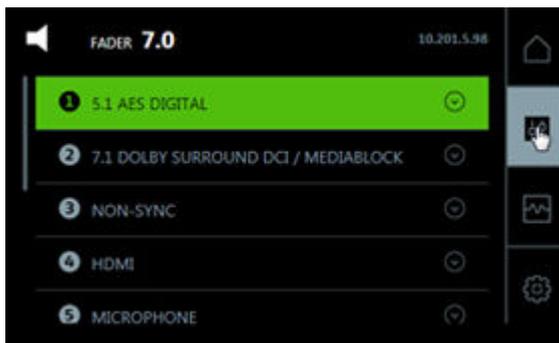
If the currently active macro does not specify AES3 inputs or HDMI (as applicable for non-sync and microphone), the input status displays **N/A**.

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, and then locate and press the macro you want to activate. The current macro is highlighted in green.

Figure 3: Press macro button



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

Figure 4: Activate and details screen

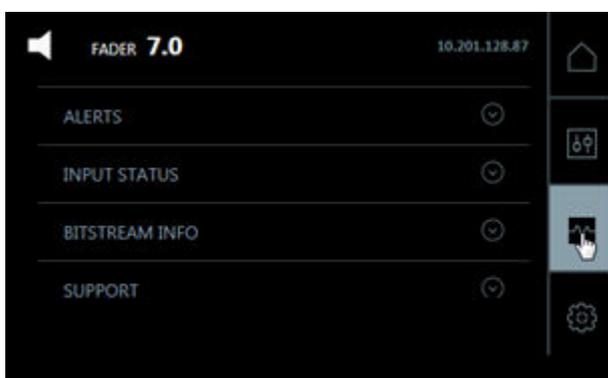


2. Press **ACTIVATE** to enable the selected macro. Press **DETAILS** to view the parameters for the selected macro. You can set the default fader level when the macro is **ENABLED**.

Information display

To display alerts, input status, bitstream information, and support contacts, press the **information** button, and then press the desired item, as shown in the following figure.

Figure 5: System information



Alerts

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

Input status for HDMI 8 × AES

Displays current connected input status.

Bitstream info

If the selected macro uses a digital input, the system displays the relevant bitstream information. If the selected macro uses a coded digital input (Dolby Digital, Dolby Digital Plus, and so on.), the system displays the relevant bitstream information.

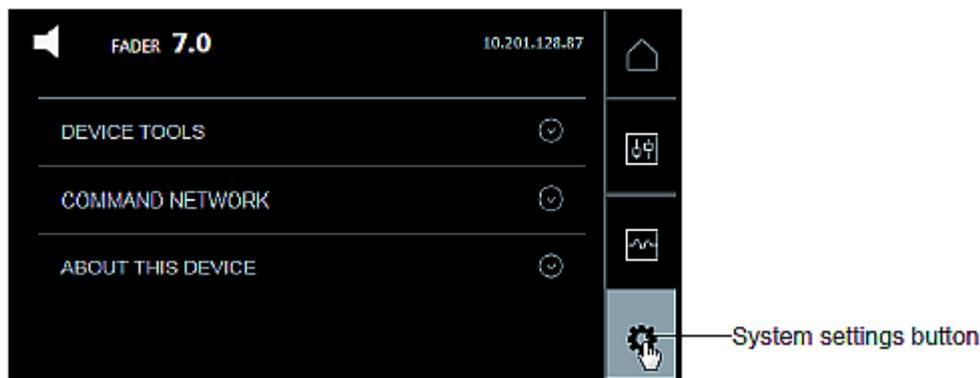
Support

Displays contact information for Dolby Cinema Solutions and Support.

System settings display and configuration

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

Figure 6: System settings



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.

Related information

[Configuring preferences](#) on page 57

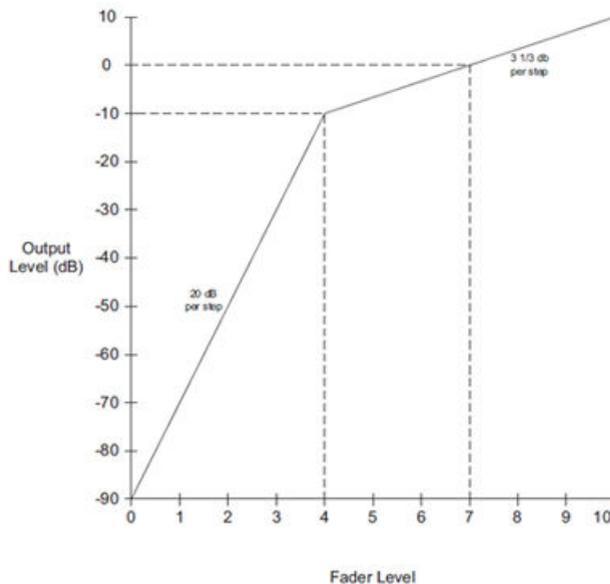
1.2.2 Main volume (fader) knob

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 normal 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 7: Fader characteristic



1.2.3 Booth monitor speaker

With this front-panel speaker, you can monitor the audio on any active input/macro. This includes audio from any speaker channel prior to speaker crossovers or the LCR downmix (which mixes Left, Center, and Right channels with a limiter and -10 dB pad applied).

The LCR downmix is the default.

1.2.4 Booth Monitor speaker volume

With this smaller right-side volume knob, you can adjust the booth monitor speaker volume. The booth monitor speaker volume defaults to the lowest setting (silent) each time you start up the system.

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 power state.

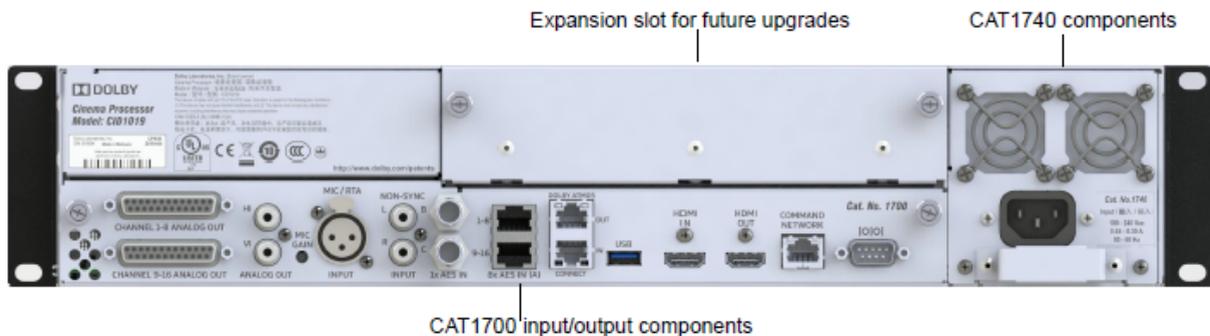
Table 1: Power indicator LEDs

Color	State
Flashes yellow once or twice, and then solid yellow	Unit is powering up but not operating (booting)
Solid red	Unit is powered but not operating (fatal error)
Solid green	Unit is powered and operational
Solid yellow	Unit is powered and there is an error or alert

1.3 Dolby CP950 rear panel

The following figure shows the Dolby CP950 rear-panel components.

Figure 8: CP950 rear panel



1.3.1 CAT1700 input and output components

The Dolby 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 input and output connectors are all located on the CAT1700 main board.

The Dolby 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.
- Digital audio output is transmitted via the **Dolby Atmos Connect** ports. These RJ45 Ethernet connectors support audio in either AES67 or BLU Link protocols.

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 Dolby CP950 is similar to a Dolby CP750 installation. For a Dolby CP950, 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.

If needed, you can apply internal crossover filters using Dolby Atmos Designer software, version 3.2.10 or later. In addition, you can change the routing parameters to use both analog and digital outputs (cannot exceed 16 channels).

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. In addition, if you use Dolby CP950 crossovers, you cannot split the output of a speaker between analog and digital. For example, if the left speaker is 3-way, all outputs must be of the same type.

Following is a description of the Dolby CP950 CAT1700 input/output (I/O) 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 Dolby 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 HI output. By default, the system routes AES channel 7 from a digital cinema server 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 dedicated HI track (trailers or advertising). You can also enable timing changes for the **8 × AES IN** connector using the **macro editor**. This can help you to accurately synchronize the HI audio with the auditorium sound. Similarly, in the **macro editor** you can use the **HI** output as a more generic analog output by clicking the **analog output selection** tab, selecting the **Analog Output A / HI**, configuration, and unchecking the **Auto** checkbox in the **configure analog output** screen. For more information on this option, see Section 3.2.7.

Visually Impaired (VI) connector

You can use this RCA analog audio output for visually impaired narration that is typically transmitted to AES channel 8 from a digital cinema server. You can configure visually-impaired routing using the web client **macro editor**. You can also enable timing changes for the **8 × AES IN** connector using the **macro editor**. This can help you to accurately synchronize the visually impaired narration audio with the auditorium sound. Similarly, in the **macro editor** you can use the **VI** output as a more generic analog output by clicking the **analog output selection** tab, selecting the **Analog Output B / VI**, configuration, and unchecking the **Auto** checkbox in the **configure analog output** screen. For more information on this option, see Section 3.2.7.

Microphone (MIC) or Real-Time Analyzer (RTA) input

This XLR connector allows you to connect and use a microphone with the Dolby for public address announcements. You can also use this connector with a microphone for calibration when using the internal Dolby Real-Time analyzer (RTA).

 **Note:** When using the internal RTA, you must not use the **microphone** macro. Feedback could damage the speakers.

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

Microphone (MIC) gain

This multiple-turn trimpot allows you to make gross adjustments to the gain of the microphone preamp if there is too much or too little volume in the auditorium. You should also use this trimpot when configuring the internal RTA to adjust the microphone gain for the proper range in the web client **equalization** RTA screen.

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 root mean square (RMS) maximum input. You can use the nonsync input gain to adjust the nonsync input level to match any given source, which you can control in the web client **macro editor**.

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 the BNC B for BLU Link word clock synchronization.

8x AES In ports

These RJ45 ports can receive eight digital audio AES/European Broadcasting Union (EBU) streams (two channels per stream providing a total of 16 input channels). The eight AES3 input signals must be time aligned with each other.

This connector can be used in two different ways, which you can configure in the CP950 web client **macro editor**.

When you configure the macro to use the **16ch., Projector/MediaBlock** input, the CP950 accepts PCM audio at 48 kHz and 96 kHz. Typically, this input connects to the main audio output on a digital cinema playback system.

When you configure the macro to use the **16ch. AES Digital** input, the CP950 accepts Dolby Digital, Dolby Digital Plus, Dolby E, or PCM audio at 32, 48, 96, 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. Typically, this input connects to consumer playback equipment.

Dolby Atmos Connect In and Out ports

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

HDMI In and Out connectors

The Dolby CP950 has one HDMI input port and one HDMI output port for use with alternative content. These ports support HDMI 2.0 and HDMI 2.2. In some cases, HDMI 2.0 will not connect with older equipment. To help with this integration issue, there is a setting in the web client **macro editor** that allows you to select HDMI 1.4. You can configure these ports for either HDMI 1.4 or HDMI 2.0 (or later) compatibility, which allows you to use any HDMI device as an audio source. For more information, see Section 3.2. The Dolby CP950 passes the selected HDMI input video data to the HDMI output connector.

Command Network port

This Gigabit Ethernet port connects the Dolby 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 that is used for ASCII commands through the Ethernet Telenet protocol 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.

The equipment connected to this port should have its serial port set to 9,600 baud, no parity, one stop bit. For more information and supported commands, see Chapter 10.

Related information

[Pinouts for Dolby CP950 connectors](#) on page 111

[Configuring preferences](#) on page 57

[Configuring a room](#) on page 54

[Configuring macros](#) on page 38

1.3.2 CAT1740 AC input

The CP950 uses a CAT1740 power supply module to supply power to the CP950. This input is a simple unswitched International Electrotechnical Commission (IEC) power inlet module that is typically used in computers. The power supply supports 100-240 VAC and draws 0.64-0.30 Amps. The alternating current frequency is between 50-60 Hz.

1.4 Contacting Dolby

You can contact Dolby Cinema Solutions and Support using email or regional telephone numbers. You can also access documentation by visiting the Dolby customer portal.

Contact Dolby Cinema Solutions and Support

- Send an email to cinemasupport@dolby.com.
- Call:

Americas: +1-415-645-4900

Europe/Middle East/Africa (EMEA): +44-33-0808-7700

Asia-Pacific (APAC): +86-400-692-6780

Japan: +81-3-4540-6782

Access documentation

Visit www.dolbycustomer.com.

Submit feedback about this documentation

Send an email to documentation@dolby.com.

2

Installing the Dolby CP950 in a Dolby Digital Cinema network

Authorized technicians can install the Dolby CP950 in a Dolby Digital Cinema. The installation process requires a hardware set up and network configuration.

- [Dolby CP950 packing kit](#)
- [Mounting the Dolby CP950](#)
- [Mains Power wiring](#)
- [Connecting cables](#)
- [Dolby CP950 wiring diagram](#)
- [Connecting the Dolby CP950 to the auditorium \(command\) network](#)
- [Connecting the Dolby CP950 to a Dolby Digital Cinema playback system](#)
- [Connecting amplifiers](#)
- [Updating and configuring the playback system](#)
- [Starting up the Dolby CP950](#)
- [Configuring the network settings](#)
- [Performing USB functions](#)

2.1 Dolby CP950 packing kit

The Dolby CP950 packing list identifies the additional components that ship with the system.

The Dolby CP950 ships with these components:

- North America power cable
- International power cable (nonterminated)
- China (CCC) power cable
- Unpinned RJ45/DB25 adapter (for older media blocks with DB25 audio connectors)
- Potentiometer trimmer tool for microphone gain
- *Dolby CP950 Quick Start Guide*

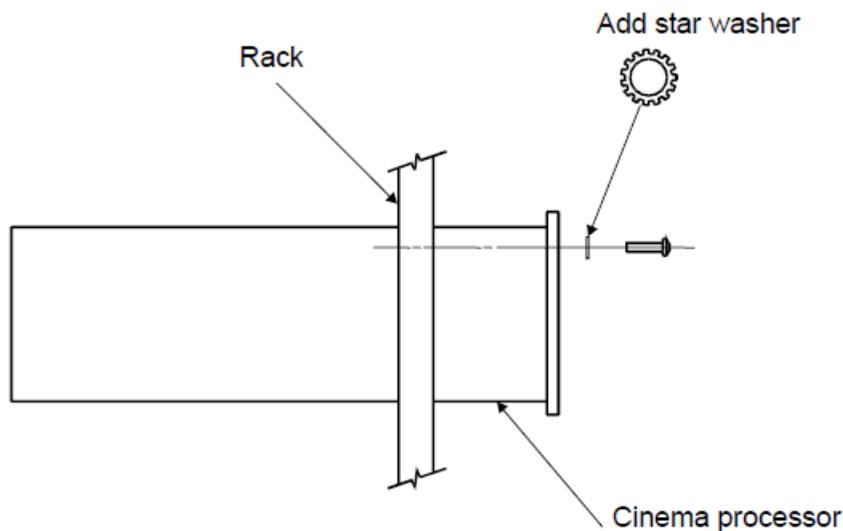
2.2 Mounting the Dolby CP950

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

To ensure good ground contact, install a star washer on at least one (and preferably all) rack-mounting screws. 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 9: 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 Dolby CP950 ventilation cutouts on the right side of the unit.

Figure 10: 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 , 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 only 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 cables

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

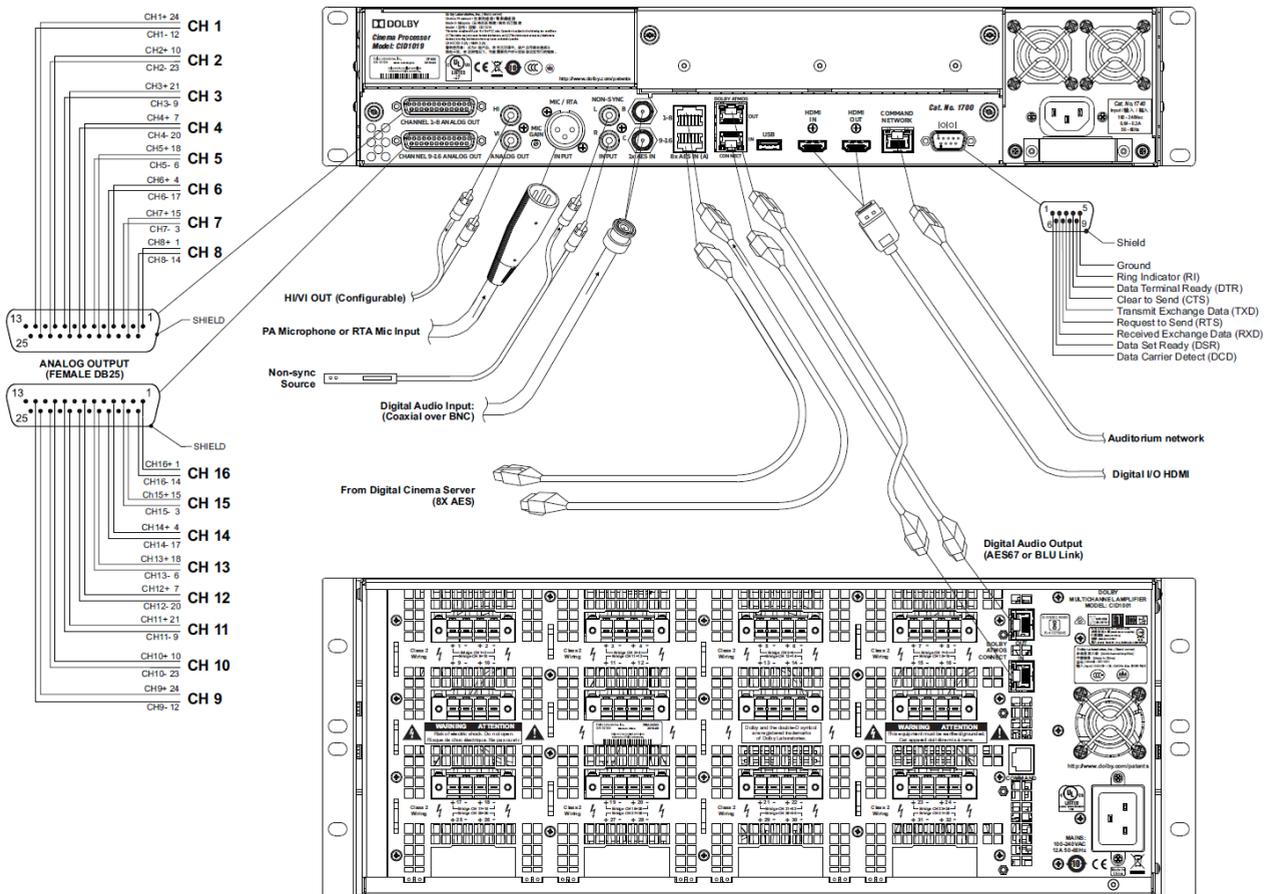
Related information

[Pinouts for Dolby CP950 connectors](#) on page 111

2.5 Dolby CP950 wiring diagram

This figure shows the Dolby CP950 wiring diagram.

Figure 11: Dolby CP950 wiring diagram



2.6 Connecting the Dolby CP950 to the auditorium (command) network

Use a CAT5e (or greater) Ethernet cable to connect the Dolby CP950 rear-panel **COMMAND NETWORK** port to the auditorium network switch. In some environments, where high EMI is present, we recommend the use of shielded cables.

Figure 12: Connecting the Dolby CP950 to the Auditorium Network



2.7 Connecting the Dolby CP950 to a Dolby Digital Cinema playback system

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

Newer systems (Dolby IMS1000, Dolby IMS2000, Dolby IMS3000, Dolby integrated media block (IMB) with Dolby ShowVault, Dolby CAT745 IMB with Dolby DSS220), output audio to the Dolby 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 (Dolby DSS200, Dolby DCP-2000, Dolby 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. Note that for a Dolby DSS200, you also need to use a female-to-female gender changer, which is not included in the Dolby CP950 packing kit.

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

Related information

[Pinouts for Dolby CP950 connectors](#) on page 111

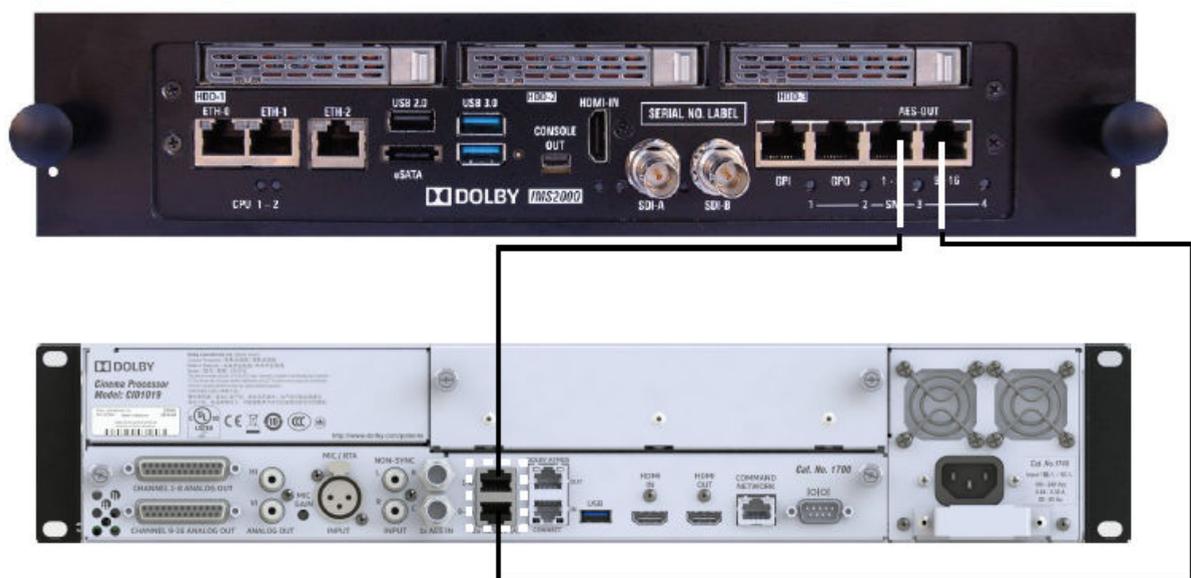
2.7.1 Connecting an IMS or IMB to the Dolby CP950

To connect an integrated media server (IMS) or integrated media block (IMB) to a Dolby CP950, connect the IMS or IMB AES out ports to the Dolby CP950 **8x AES INPUT** ports using CAT5e (or greater) Ethernet cables.

The Dolby IMS1000, Dolby IMS2000, Dolby IMS3000, Dolby IMB with Dolby ShowVault, and Dolby CAT745 IMB with Dolby DSS220 use the same type of connections (Channels 1-8 on one Ethernet cable, Channels 9-16 on another Ethernet cable). For cases where the cable distance is more than 50 feet (15 meters), we recommend that you use shielded twisted pair cables.

The example in the following figure shows a Dolby IMS2000 connection to a CP950.

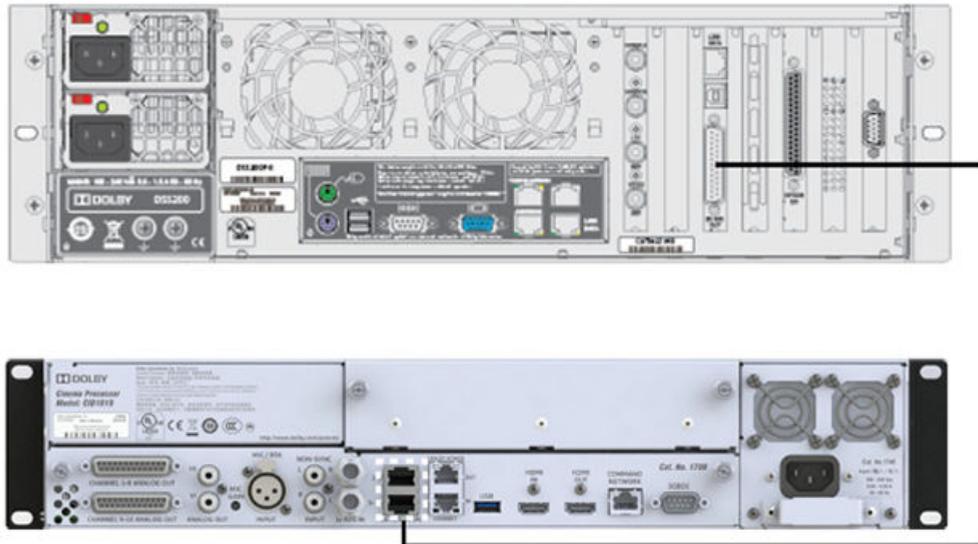
Figure 13: Connecting a Dolby IMS2000 to a Dolby CP950



2.7.2 Connecting a Dolby DSS200 to the Dolby CP950

Connect the DSS200 **8x AES OUTPUT** port to the CP950 **8x AES INPUT** ports with 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 Advanced Encryption Standard (AES) output port. We recommend connecting the adapter to the DSS200 and then connecting the Ethernet cables to the CP950. Reducing the number of connections is useful in preventing electro-magnetic interference (EMI).

Figure 14: Connecting a Dolby DSS200 to the Dolby CP950



Related information

[Pinouts for Dolby CP950 connectors](#) on page 111

2.7.3 Connecting a Dolby DCP-2000 to the Dolby CP950

To connect the Dolby DCP-2000 to the Dolby CP950, connect the Dolby DCP-2000 **AES** output port to the Dolby CP950 **8x AES INPUT** ports with shielded CAT5e (or greater) Ethernet cables using the provided DB25-to-RJ45 adapter, as shown in the following figure. We recommend connecting the adapter to the DCP-2000, and then connecting the Ethernet cables to the CP950. Reducing the number of connections is useful in preventing electro-magnetic interference (EMI).

Figure 15: Connecting a Dolby DCP-2000 to the Dolby CP950



Related information

[Pinouts for Dolby CP950 connectors on page 111](#)

2.7.4 Connecting a Dolby DCP-2K4 to the Dolby CP950

To connect the Dolby DCP-2K4 to the Dolby CP950, connect the Dolby DCP-2K4 AES port to the Dolby CP950 **8x AES INPUT** ports with shielded CAT5e (or greater) Ethernet cables using the provided DB25-to-RJ45 adapter, as shown in the following figure. We recommend connecting the adapter to the DCP-2K4, and then connecting the Ethernet cables to the CP950. Reducing the number of connections is useful in preventing electro-magnetic interference (EMI).

Figure 16: Connecting a Dolby DCP-2K4 to the Dolby CP950



Related information

[Pinouts for Dolby CP950 connectors on page 111](#)

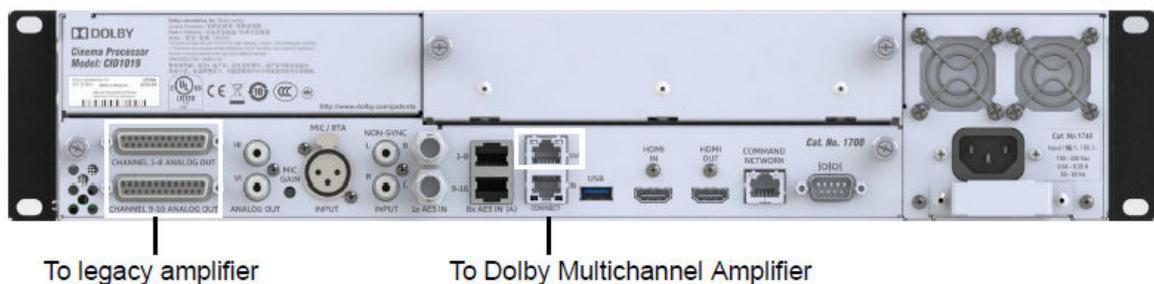
2.8 Connecting amplifiers

You can connect analog amplifiers and a Dolby Multichannel Amplifier to the Dolby CP950.

Procedure

1. For analog amplifier installs, connect the Dolby 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 CAT5e (or greater) Ethernet cable to connect the Dolby CP950 **Dolby Atmos Connect Out** port to the **Dolby Atmos Connect In** port on the downstream device.

Figure 17: Connecting Amplifiers



2.9 Updating and configuring the playback system

Your playback system must be installed with the correct software version and you need to configure the playback system to work with the Dolby CP950.

Updating the Dolby DSS220 or DSS200 playback systems

- Use software v4.9.4 or later, which adds the Dolby CP950 automation commands.
- Run the DSS Config script to select the Dolby CP950 as your cinema processor.
- If needed, use the media block (MB) setup software to set the MB delays.

Updating the Dolby/Doremi playback systems

- Update the Dolby DCP-2000, Dolby DCP-2K4, Dolby IMB with Dolby ShowVault, Dolby IMS1000, Dolby IMS2000, or Dolby IMS3000 playback systems with the Dolby CP950 cue bundle package.

You can download the updated Dolby DSS software or the Dolby CP950 cue bundle package for Dolby/Doremi playback systems at www.dolbycustomer.com.

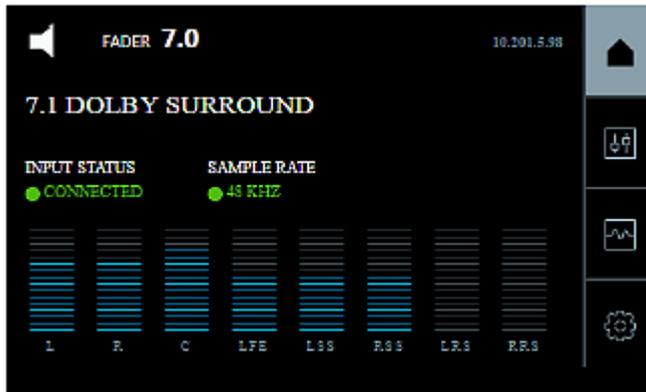
Refer to your respective Dolby Digital Cinema playback system documentation for instructions on how to perform these tasks.

2.10 Starting up the Dolby CP950

The Dolby 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 user interface (FPUI) displays the home screen with the current fader setting, IP address, input status, sample rate, and audio meter, as shown in the following figure.

Figure 18: Front-Panel UI Touch Screen



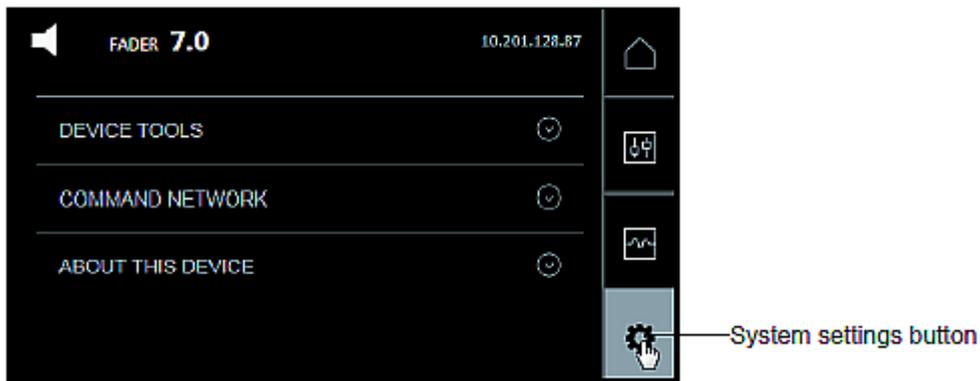
2.11 Configuring the network settings

You must configure your network settings after you perform the hardware installation.

Procedure

1. Press the **system settings** button, and then press **COMMAND NETWORK**, as shown in the following figure.

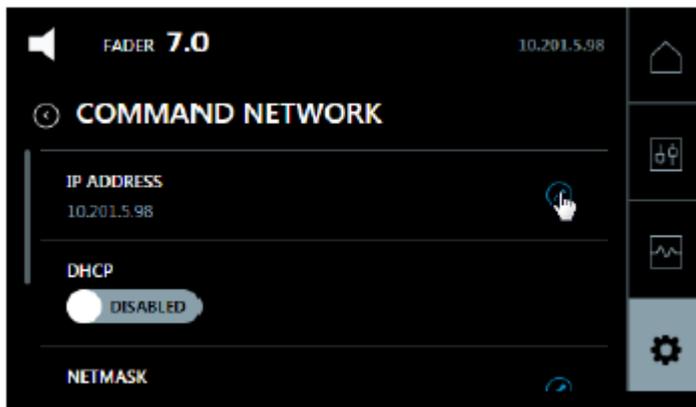
Figure 19: Front-Panel UI Touch Screen



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 20: Press IP address Icon



A soft keyboard appears where you can change the IP address, as shown in the following figure.

Figure 21: 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**.
The system automatically updates these settings after each step. In some cases, you may need to reboot.

What to do next

After starting up the system and configuring the network settings, you can use your web browser to connect to the Dolby CP950.

Related information

[Connecting to the Dolby CP950](#) on page 33

2.12 Performing USB functions

You can use the Dolby CP950 Universal Serial Bus (USB) port to perform specific functions by inserting a USB storage device (flash drive) that contains a specifically named file or folder in the root of the USB device. Supported file systems are file allocation table (FAT) and FAT32. Mechanical hard drives are not supported, as these devices draw more power than the Dolby CP950 USB port can provide.

 **Note:** Do not use the USB port during normal operations. By doing so, audio playback can be interrupted for a short time.

You can perform the following functions:

Viewing and downloading system logs

Create a file or folder at the root of a USB device, and name it *extract-logs*. If creating a file, there should be no file extension. Plug the storage device into the USB port on the back of the CP950 and wait one minute. The system generates the logs and saves them to your USB device in a file named *cp950_logs.tgz*.

Generating a backup via a USB storage device

Create a file or folder at the root of a USB device, and name it *backup*. If creating a file, there should be no file extension. Plug the storage device into the USB port on the back of the CP950 and wait one minute. The system generates a log report *cp950_logs.tgz* file, and a *dolbyAtmosConfiguration.dac* backup file and saves these files to your USB device.

Resetting to factory settings via a USB storage device

Create a file folder at the root of a USB device, and name it *factory-reset*. If creating a file, there should be no file extension. Plug the storage device into the USB port on the back of the CP950 and wait one minute. The system generates a log report *cp950_logs.tgz* file, and a *dolbyAtmosConfiguration.dac* backup file and saves these files to your USB device. Then, the system resets to factory settings.

3

Working with the web client user interface

The Dolby CP950 provides a web client user interface (UI) that enables you to connect to the unit, and operate, monitor, and configure settings.

- [Connecting to the Dolby 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](#)

3.1 Connecting to the Dolby CP950

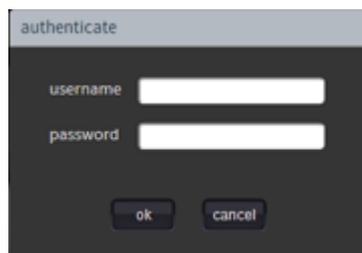
After you install the Dolby CP950 and configure the network settings, connect your computer to the Dolby CP950.

Procedure

1. Connect the Dolby CP950 and your computer to the auditorium network switch. Alternatively, you can connect your computer directly to the Dolby CP950 if your computer is connected to a gigabit Ethernet switch.
2. Open the web browser on your computer. Currently, the Dolby CP950 is compatible with Google Chrome v71.x or later. You can use other browsers, but you may experience issues in the Dolby CP950 web client user interface (UI).
3. Connect to the Dolby CP950 by typing its IP address in your web browser.

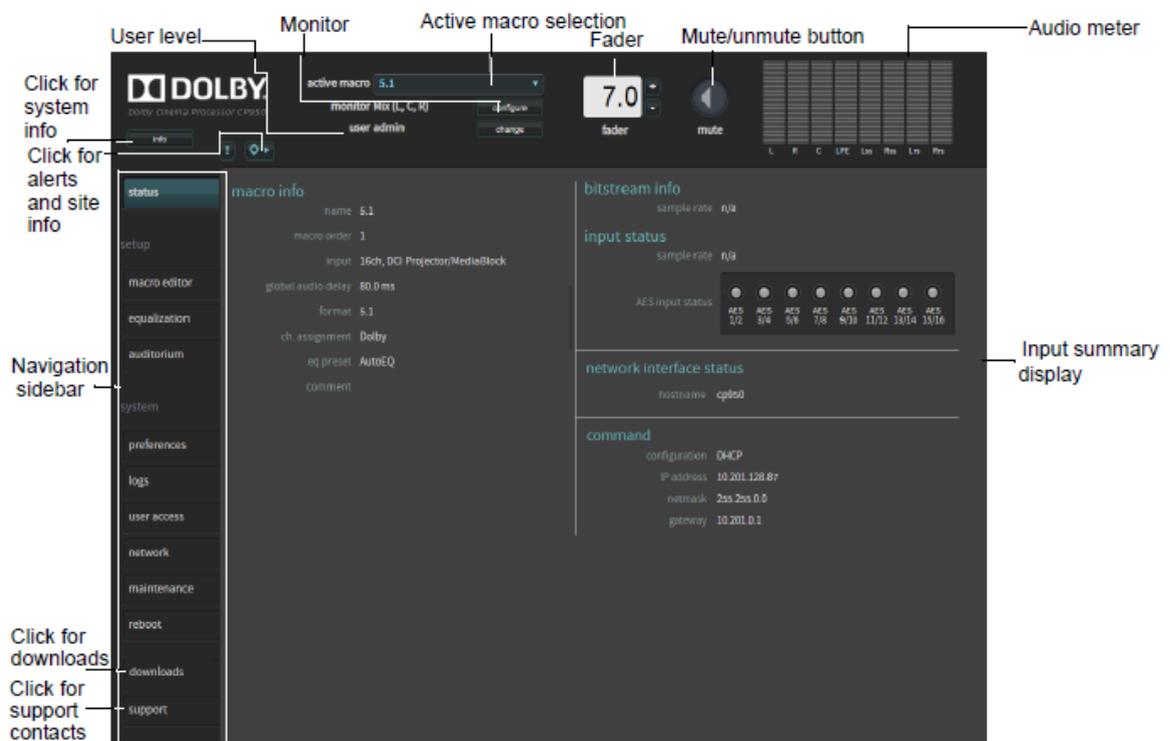
An **authenticate** login screen appears requesting a user name and password, as shown in the following figure. The default administrator user name and password are both *admin*. If you are a system administrator, you should change the administrator password, and then set up user access levels and passwords for all other users, as described in Section 3.7.

Figure 22: Authenticate Login Screen



4. After you log in, the Dolby CP950 web client **status** screen appears, as shown in the following figure.

Figure 23: Dolby CP950 Web Client Status Screen



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

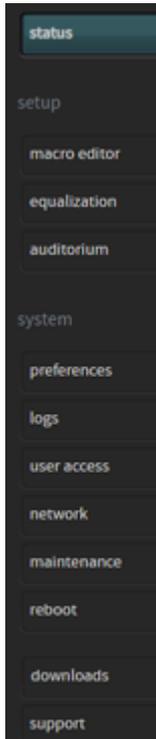
Related information

[Setting up user access](#) on page 61

3.1.1 Navigation sidebar

The Dolby CP950 navigation sidebar (shown in the following figure) provides access to the Dolby 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.

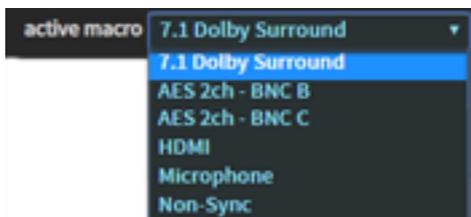
Figure 24: Navigation Sidebar



3.1.2 Active macro field

In this field, you can select the desired macro to use for your input source. The Dolby 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.

Figure 25: Active Macro Menu



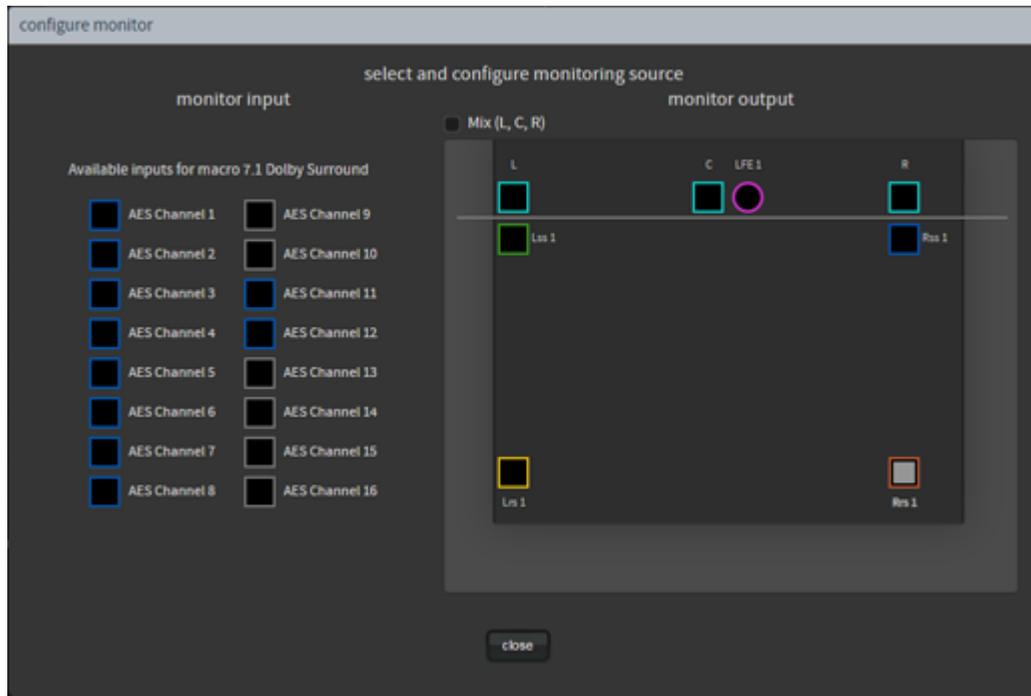
Related information

[Configuring macros](#) on page 38

3.1.3 Monitor mix field

Click the **configure** button next to this field to display the **select and configure monitoring source** screen, as shown in the following figure. You can select and monitor a mix of the Left, Center, and Right speaker (LCR) feeds, any individual speaker feed, or an AES input when the 16-channel input is active.

Figure 26: Select and Configure Monitoring Source Screen

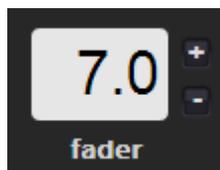


If you change to a macro that does not use an AES 16-channel input, the system defaults to Left, Center, and Right, and you can select a speaker to monitor. In such a case, the monitor input options shown in the previous figure are not available. Similarly, they are not available if the unit is inputting coded audio (for example, Dolby Digital) rather than the DCI standard, which is PCM. 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

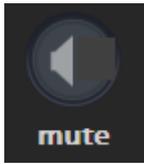
Increase or decrease the volume by clicking the plus (+) or minus (-) buttons or by entering the desired value in this field.

Figure 27: Fader Field



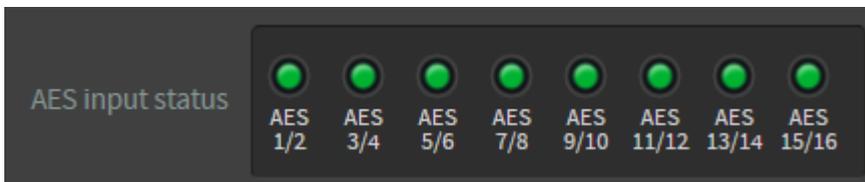
3.1.5 Mute button

Click this button (shown in the following figure) to mute and unmute the system.

Figure 28: Mute Button

3.1.6 Input status display color indicators

In the **input status** display, you can check the current state of the Dolby CP950 input channels, which is indicated in small circles, as shown in the following figure. These indicators represent the **8x AES** input or the **1x AES** input.

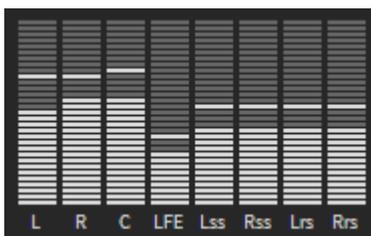
Figure 29: AES input status display

Following are the color indicators that define the current state of the Dolby CP950 input channels:

- Green indicates a good connection. Includes channel pairs required by the active macro with a good connection. In addition, it includes channel pairs not required for the active macro with a good connection.
- Red indicates no connection. Includes channel pairs that are required by the active macro and are not connected.
- Gray indicates channel pairs that are not required by the active macro and are not connected.
- Yellow indicates an intermittent connection over AES. This could occur if the media block was power cycled, or if the cables were unplugged (or not connected securely). This includes channel pairs that were briefly disconnected, but currently show a good connection. Changing or reselecting a macro (or restarting the CP950) returns the status state to green.

3.1.7 Audio meter

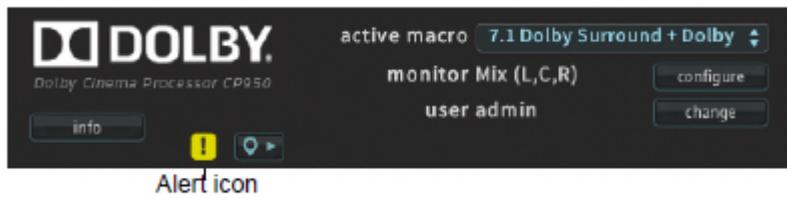
This meter displays the audio levels for channel-based audio. It shows the signal intensity of PCM input channels, decoded bitstreams, and upmixed content.

Figure 30: Audio Output Meter

3.1.8 Alerts

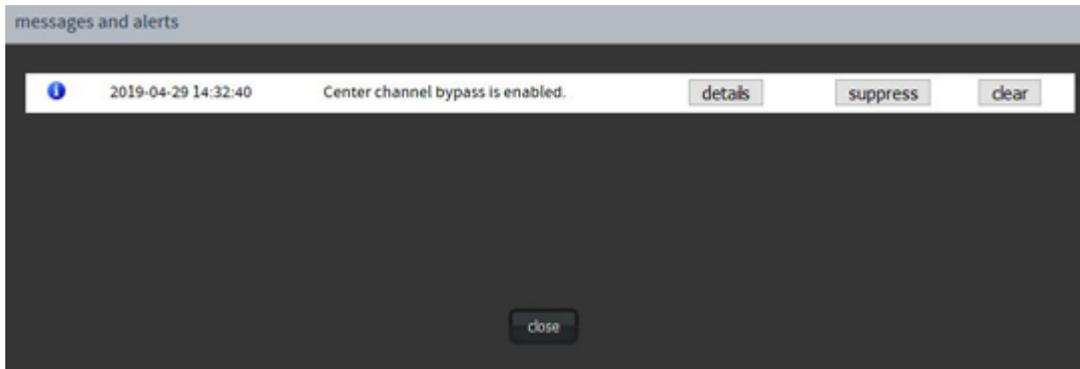
If the system activates an alert, the alert icon changes to a blinking yellow icon, as shown in the following figure.

Figure 31: 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 the example in the following figure.

Figure 32: Alert Message



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 screen.

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 after rebooting).

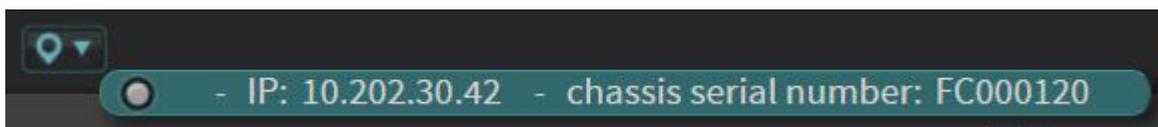
You cannot remove or suppress a temperature alert. A temperature alert disappears when the temperature returns to normal.

The Dolby 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.

3.1.9 Site information and location

To display the CP950 chassis serial number, IP address, and other site information, click the **site** 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. The location information is obtained from a custom room configuration that is created in Dolby Atmos Designer (DAD). If you do not use DAD to set up the CP950, some of the location information is blank or generic.

Figure 33: Site Information Pop-up



3.1.10 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.

Related information

[Setting up user access](#) on page 61

3.1.11 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, as shown in the following figure.

Figure 34: Dolby CP950 Information



If you need an RMA for a faulty part, the **info** button is a good resource where you can find the CP950 chassis serial number. This is the main serial number for the unit and is required for all RMAs. The CAT1700 main board contains all of the inputs and outputs and controls audio processing.

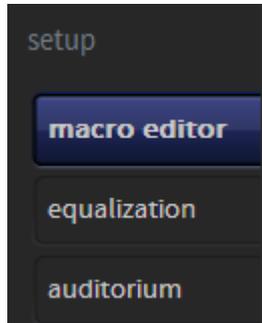
3.2 Configuring macros

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 IN** connector.
- **7.1 Dolby Surround:** Processes a 7.1 signal from a digital cinema playback system through the **8 × AES IN** connector.
- **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 Dolby 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. Note that for some microphones, you need to turn on **phantom power** (at +48 V) in the web client UI **macro editor** screen or in the front-panel user interface (FPUI).
- **Non-Sync:** Accepts left and right analog signals. You can add surround processing (upmixing) to this input for 5.0 or 7.0 analog signals, and turn on **derive LFE** (for low-frequency effects) to change these signals to 5.1 or 7.1.

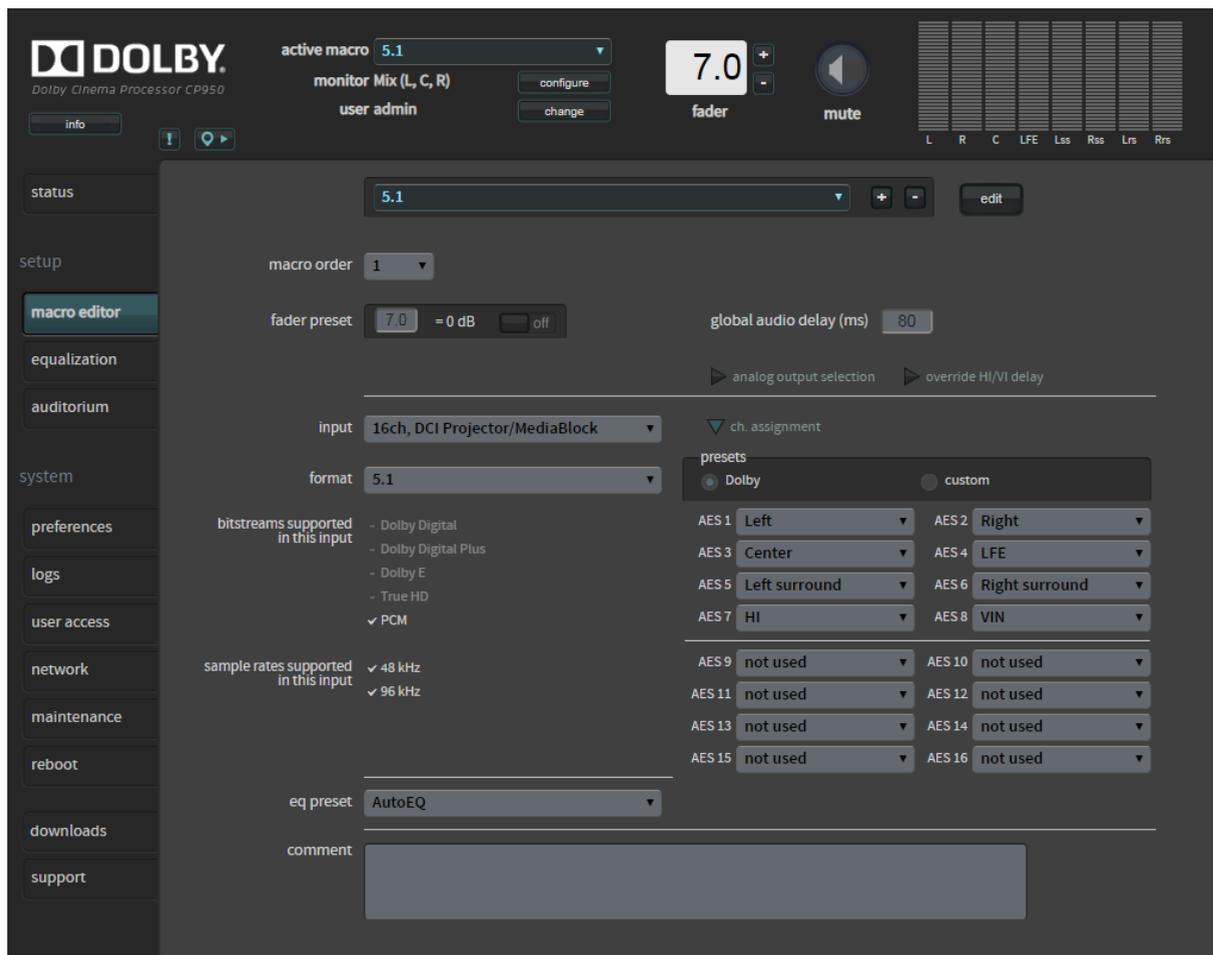
In addition, you can create macros from scratch by selecting **macro editor** in the **setup** menu. You can configure macros and assign the order in which they are displayed in the front panel user interface (FPU), as shown in the following figure.

Figure 35: 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 the plus (+) or **edit** buttons and entering the desired parameters.

Figure 36: Macro Editor Screen



When using the **8 x AES IN** connector, 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.

The following figure shows the parameters in the **macro editor** screen for a **16ch, DCI Projector/MediaBlock** input source, while the figure after 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** tabs. 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 37: Configure Macro Channel Assignment

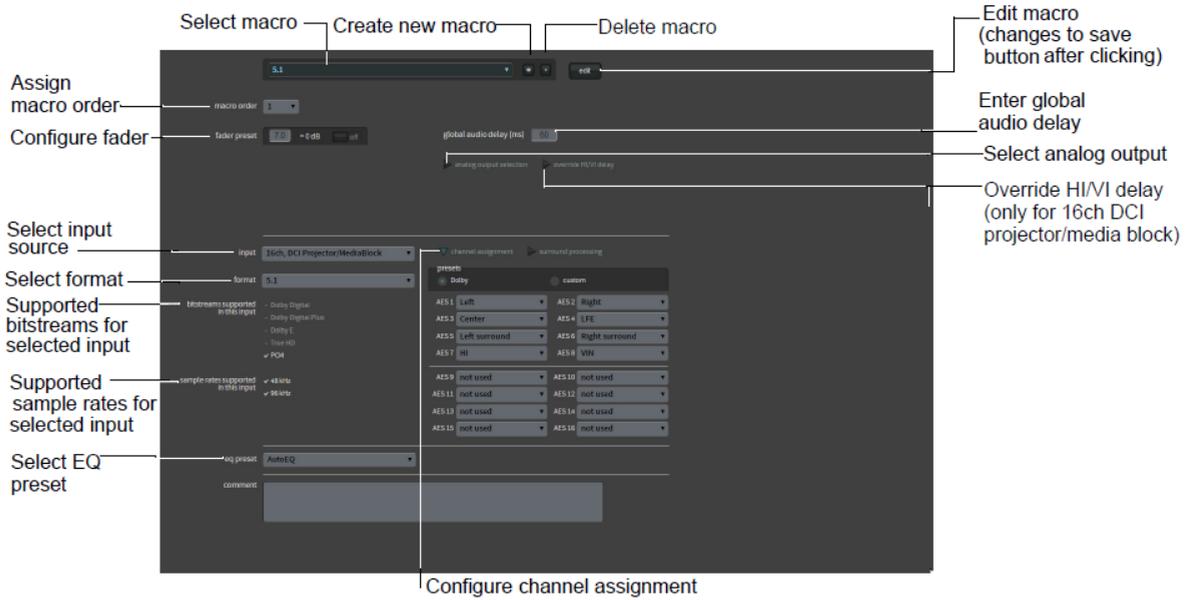
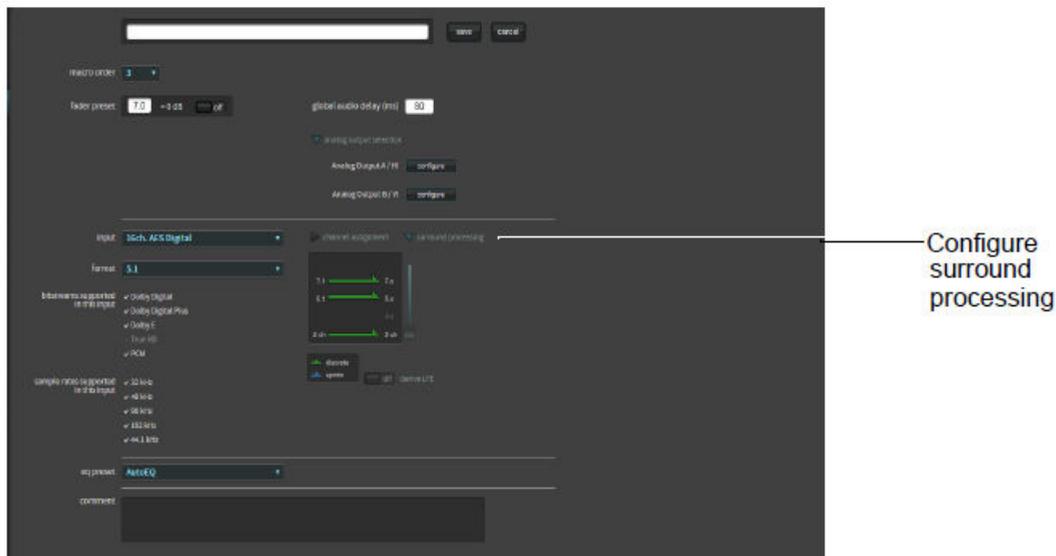


Figure 38: Configure Macro Surround Processing and Upmixing



3.2.1 Creating or editing a macro

You can create or edit a macro. We recommend that you do not edit a macro that is currently in use. When saving changed settings, audio may be lost until the macro is reconfigured and reselected.

Procedure

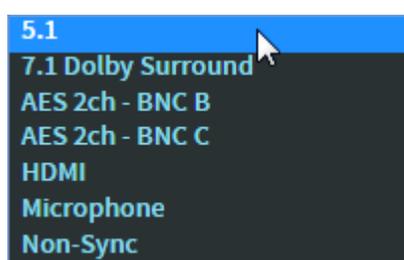
1. Click the plus (+) button to create a new macro or the **edit** button to edit an existing macro.
If you click either of these buttons, the parameter fields become active and you can enter the desired settings. In addition, the **edit** button changes to a **save** button, and a **cancel** button 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.

3.2.2 Selecting a macro

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

If you click the plus (+) or **edit** button, you can create a new macro, or edit a macro.

Figure 39: Select macro to configure



3.2.3 Deleting a macro

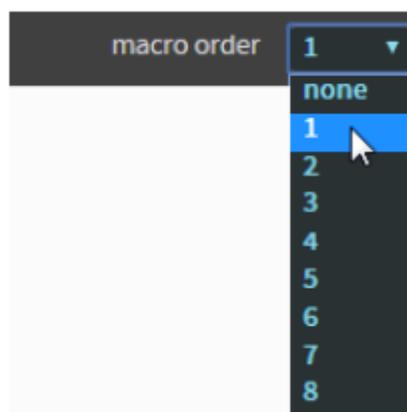
You can delete a macro.

Click the minus (-) button to delete the selected macro.

3.2.4 Macro order

Click in this field to assign a macro number for your macro, as shown in the following figure. Your selection appears in numerical order for the macros displayed on the front panel user interface (FPU).

Figure 40: Assign macro number



3.2.5 Fader preset

You can enter a default fader value for a macro.

Click in this field to enter a default fader value for your macro, as shown in the following figure. 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 41: Enter Fader Preset



3.2.6 Global audio delay

You can enter a global audio delay for a macro.

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 MB when using a 16-channel input. The minimum global audio delay for digital cinema content is 20 milliseconds, and the maximum is 1,000 milliseconds. (For details, refer to the media-block setup instructions in your *Dolby 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 42: Enter Global Audio Delay

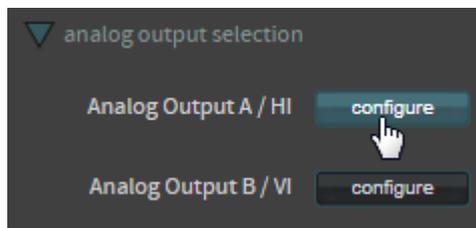


3.2.7 Analog output selection

You can configure the **HI** and **VI** analog outputs. This is useful if you want to use an external booth monitor or output alternative audio for nonstandard installations.

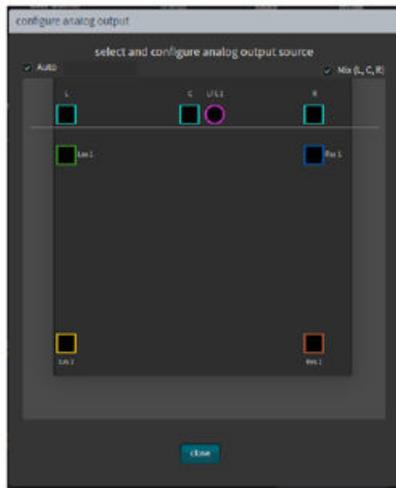
Click this tab to activate the **configure** buttons for the **HI** and **VI** analog outputs. If these analog outputs are not used to provide audio to an accessibility system, you can repurpose them for other functions. These settings override the setup described in Section 3.2.11.

Figure 43: Activate Analog Output Configuration



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

Figure 44: Configure Analog Output

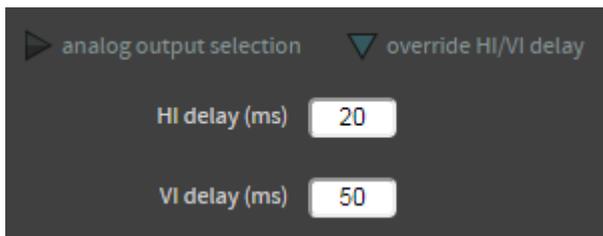


3.2.8 Override HI/VI delay

You can control the timing of the hearing impaired and visually impaired narration.

This parameter appears when you select **16ch, DCI Projector/Media Block** as the **input** for your macro, as shown in the following figure. 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 dialog from the main audio. The system applies the resulting values to the **HI** and **VI** analog outputs. These parameters are independent delay controls and are not related to the global audio delay.

Figure 45: Override HI/VI Delay

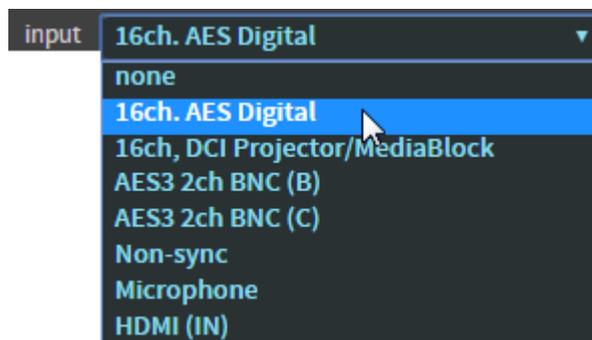


3.2.9 Input

You can select the desired input source.

1. Click in the **input** field.

Figure 46: Select Input Source



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

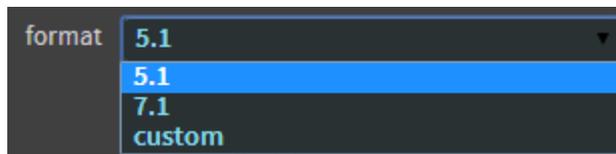
- When connecting to a digital cinema media block (IMS, IMB, or external) use the **16ch, DCI Projector/MediaBlock** input option. This option processes audio correctly for such a device.
- In cases where you are not using a digital cinema source or if you are transmitting coded audio to AES pairs 1/2,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

3.2.10 Format

You can select the desired audio 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**.

Figure 47: Select Audio Format



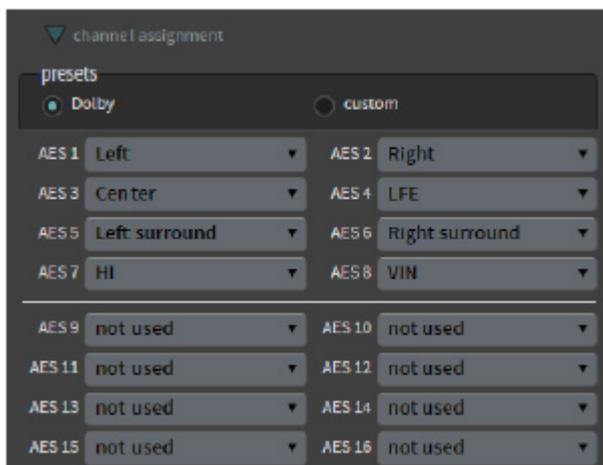
Related information

[Channel assignment](#) on page 44

3.2.11 Channel assignment

For 16-channel inputs, you can view the Dolby channel assignment presets by clicking the **ch. assignment** tab.

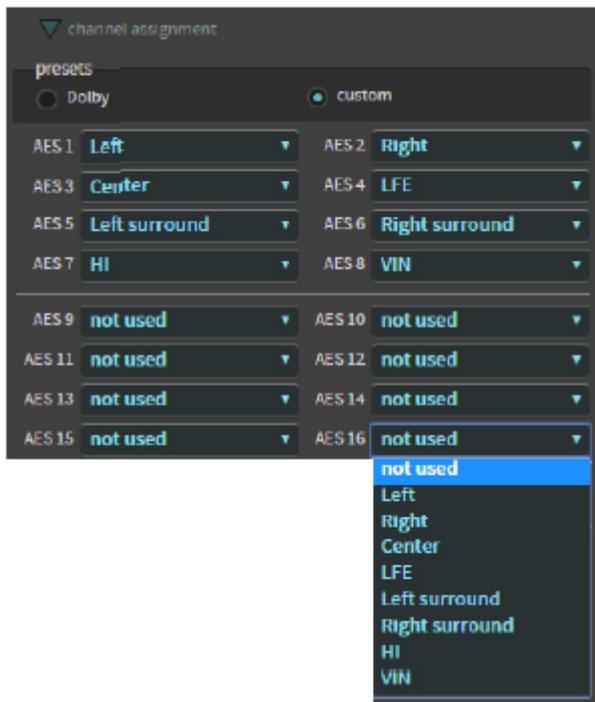
Figure 48: Dolby Preset Channel Assignments



Note: The Dolby CP950 actively monitors any AES3 channels that are in use for the current macro 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**.

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

Figure 49: Customize Channel Assignments



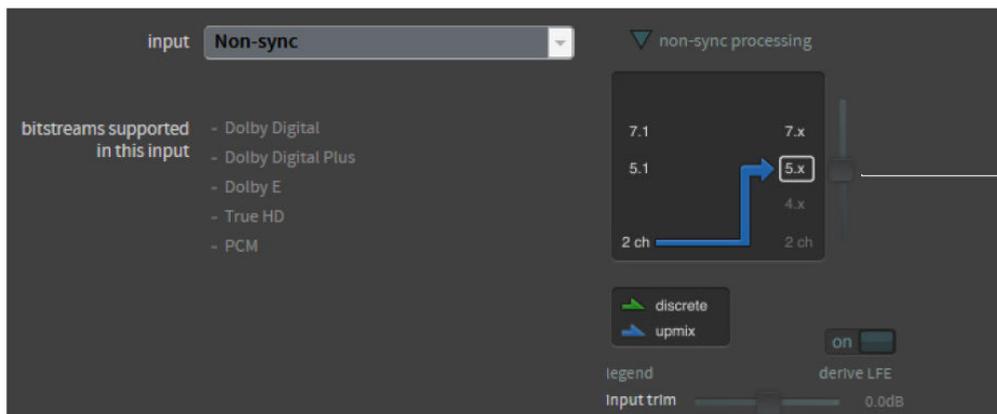
3.2.12 Surround processing

For consumer content (not digital cinema content), you 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 following figure shows the parameters for the **Non-sync** input where the system processes 2-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 50: Surround Processing Parameters (Non-Sync Input)



Move slider to configure upmixing for non-sync and encoded audio (green arrow for discrete processing changes to blue arrow for upmix).

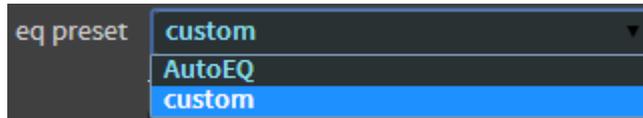
For the **Microphone** macro, you can specify that audio is transmitted from the center or surrounds. You can also enable/disable phantom power (+48 V).

3.2.13 EQ preset

You can select the EQ preset parameters.

Click on this field to select the equalization **eq 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.

Figure 51: Select an EQ Preset



Related information

[Displaying the equalization screen](#) on page 46

3.3 Displaying the equalization screen

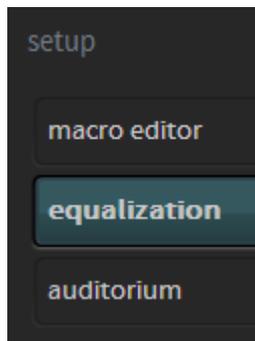
The **equalization** screen enables you to calibrate the CP950 to reproduce audio in a unique auditorium sound field.

You can do this as a stand-alone operation in the Dolby CP950 web client, or in conjunction with Dolby Atmos Designer (DAD) version 3.2.10 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 a brief overview of some of the parameters in the **equalization** screen. For additional descriptions of these and other equalization (EQ) parameters and instructions for configuring equalization, see Chapter 4.

To run EQ in the web client, select **equalization** in the **setup** menu, as shown in the following figure.

Figure 52: Select equalization in setup menu



The real-time analyzer appears in the **equalization** screen, as shown in the following figure.

Figure 53: Real-Time Analyzer equalization screen

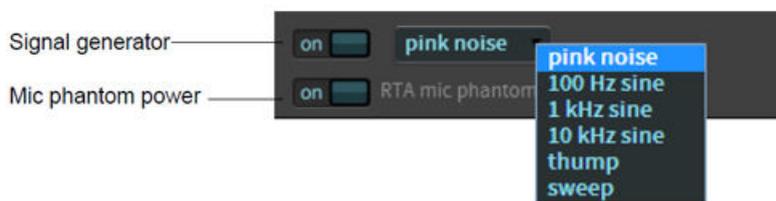


Test signal generator and microphone phantom power

The Dolby 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 54: 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.

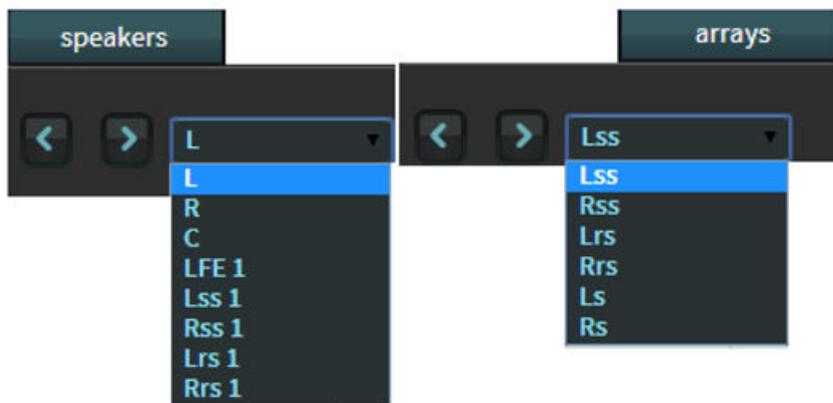
Analog levels are affected by the EQ in use and you should follow the instructions provided in this manual for calibrating a room.

Speakers and array 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 shown in the

following figure or use the arrow buttons to scroll through the list. Currently, the CP950 does not require entries into the **arrays** section of the web client UI.

Figure 55: Speaker and Arrays Feeds



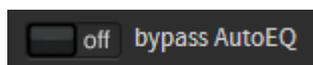
Real-Time Analyzer mic input level

The **RTA mic input level** represents the average power received by the microphone input, which is the average power measured for input frequencies between 50 Hz and 2 Kz. If you are using the internal RTA you should calibrate this level before beginning the equalization process. You can perform this adjustment by using the **MIC GAIN** input level trimpot on the CP950 rear panel, or through the **RTA mic input level adjust**, which is located below the **RTA mic input level** display in the **equalization** screen. You should adjust the **RTA mic input level**, so it is as close to 50% of full range as possible (playing pink noise at 85 dBC from the center channel). Logically, this calibrates the microphone level for use in the equalization process. For a more detailed description of this procedure, see Chapter 4.

Bypass AutoEQ

Click this **on/off** toggle button to **on** to bypass all **AutoEQ** audio calibration. If an **AutoEQ** preset is uploaded to the Dolby CP950 and you turn **bypass AutoEQ** to **on**, the system processes only manual equalization (entered in the one-third octave equalization or Grossman eq). If you are not using **AutoEQ** and no **AutoEQ** preset is uploaded, the **bypass AutoEQ** button does not function in any way.

Figure 56: Bypass AutoEQ

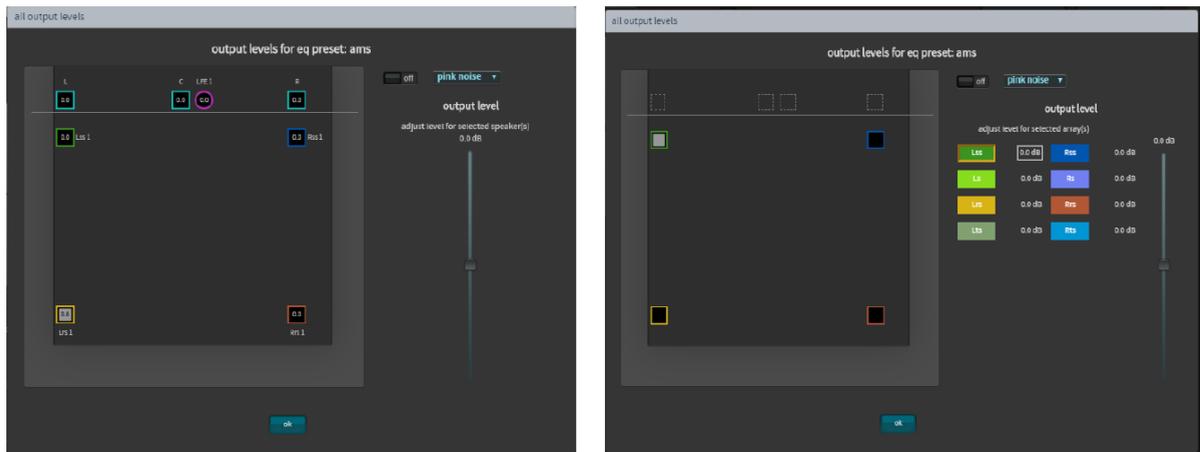


Note: When you select **on**, the system bypasses **AutoEQ** only for the speaker you are currently editing (as specified in the speaker feeds drop-down menu, as shown in Figure 57).

All output levels

Click this button to display and adjust the output levels for each speaker or array in your preset, as shown in the following figure. Select an individual speaker or array by clicking on it, or press <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.

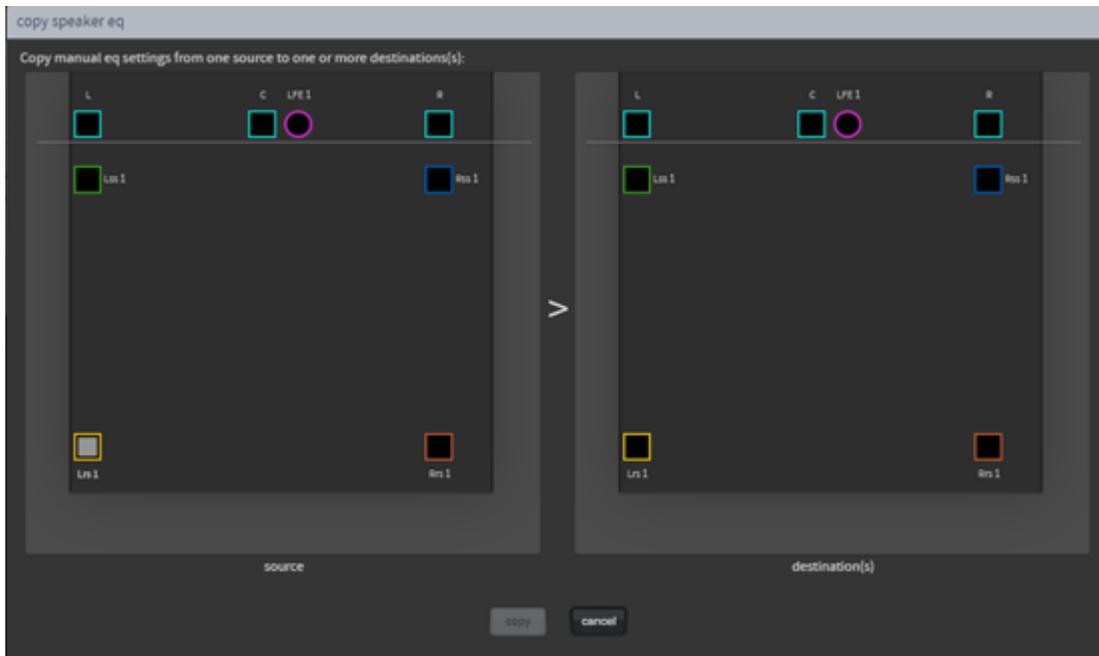
Figure 57: All output levels speakers and arrays



Copy speaker EQ

Click this button to copy manual speaker EQ settings from one source to one or more destinations, as shown in the following figure. 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.

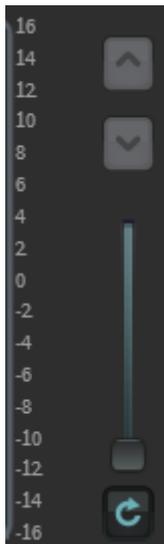
Figure 58: Manual speaker EQ



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 59: Real-Time Analyzer EQ Display Slider



Graphic equalizer

Click on the **graphic eq** button, as shown in the following figure, 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.

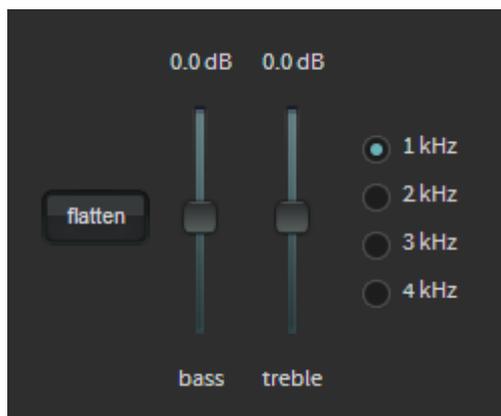
Figure 60: Graphic Equalizer



Bass and treble

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

Figure 61: 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 62: Output Level



Related information

[Configuring the equalization parameters](#) on page 71

[Configuring the equalization parameters](#)

3.3.1 Fine tuning with the Grossman eq

You can use Grossman eq to fine tune room settings.

About this task

Grossman eq is an equalization 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 narrow band EQ. This tool displays an interface that provides users with the ability to utilize the one-twelfth octave capabilities of the Dolby CP950, Dolby CP850, and Dolby 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.

Procedure

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

Figure 63: Grossman EQ Button



2. When you click the **Grossman eq** button, the Grossman eq screen appears, which is shown in Chapter 4 along with a complete description of the Grossman eq parameters.

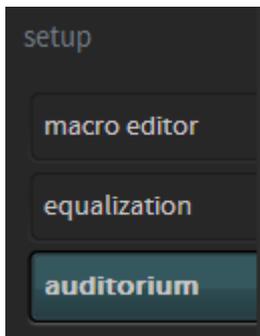
3.4 Displaying the auditorium parameters

You can display the auditorium configuration summary and routing information.

Procedure

Select **auditorium** in the **setup** menu, as shown in the following figure.

Figure 64: Select auditorium



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. The following figure shows a configuration with no crossovers, and the figure after shows a different configuration that includes two crossovers (designated by **x** icons).

Figure 65: Auditorium configuration display (room view)

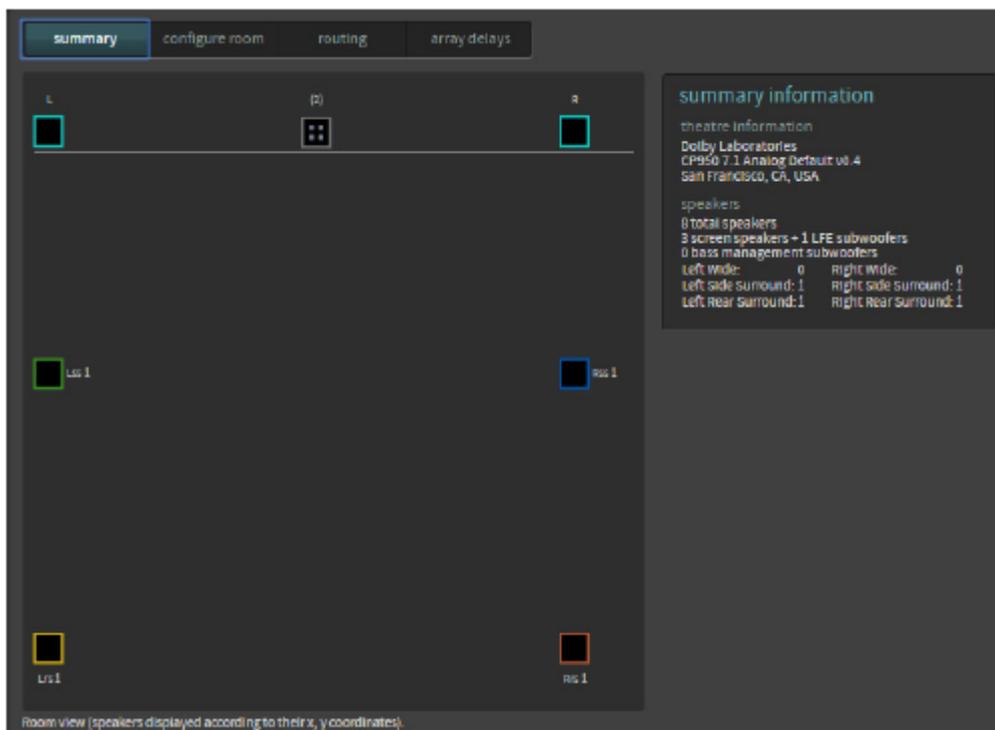
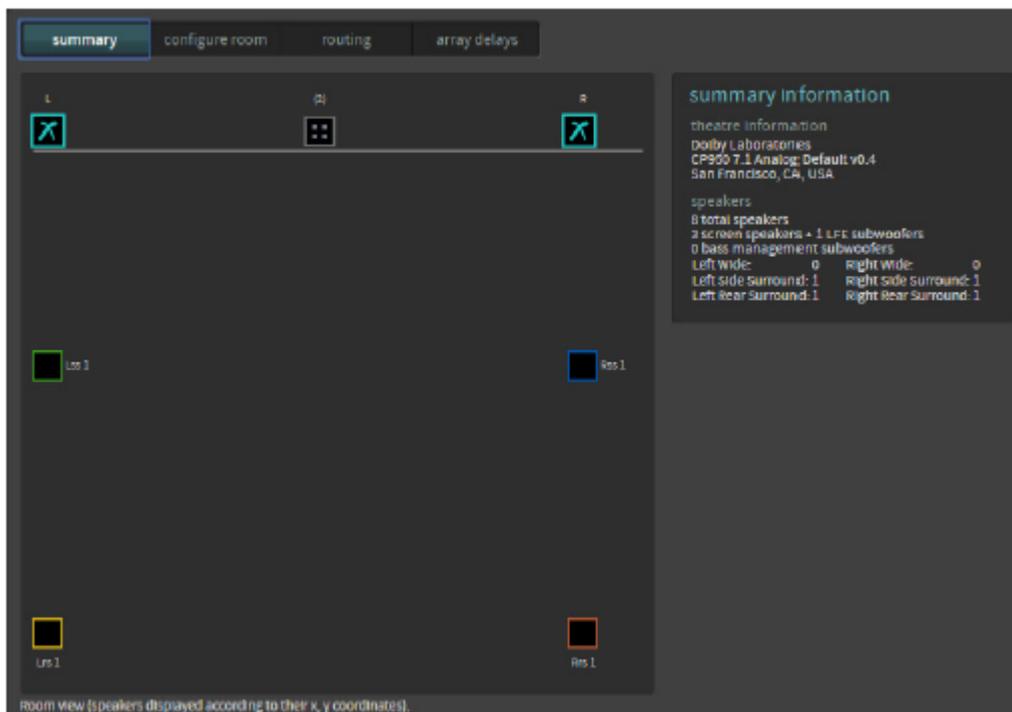
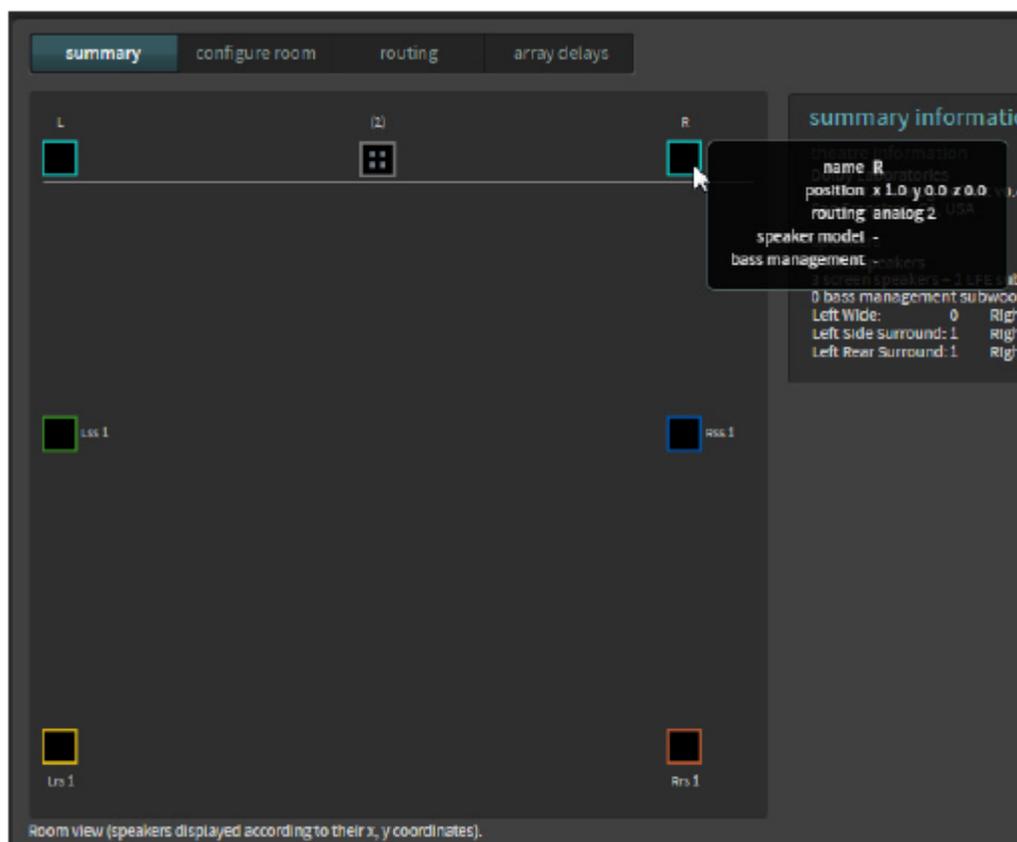


Figure 66: Auditorium configuration display (room view with crossovers)



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.

Figure 67: Hover mouse over icon to display additional information



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.

3.4.1 Configuring a room

You can configure a room using the **configure room** tab.

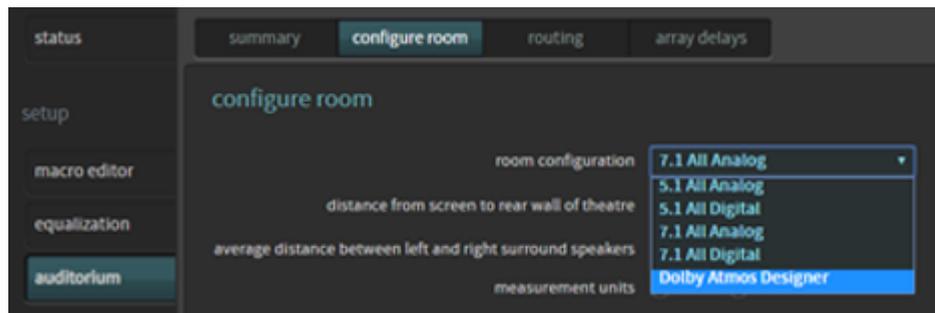
Procedure

1. Click the **configure room** tab to select the room size and surround delay.
2. To configure an auditorium without Dolby Atmos Designer (DAD), click in the **room configuration** field to display a drop-down menu, as shown in Section 4.1.
3. Select the appropriate room configuration, and then use the distance fields to enter the appropriate distances so the system can calculate the surround delays.

Note: When using a default room configuration, as described in Section 4.1, the placement of the speakers does not need to be accurate for surround delay compensation settings to work properly. If you use Dolby Atmos Designer for your room configuration, the room dimension values must be correct for surround delays to work properly.

When using DAD, you cannot make entries in the distance fields. After you upload a room configuration from DAD, **Dolby Atmos Designer** is automatically entered for the room configuration, as shown in Figure 68. You can also reselect it from the drop-down menu.

Figure 68: Configure room screen



Related information

[Configuring equalization with the Dolby CP950 Real-Time Analyzer](#) on page 72

3.4.2 Displaying the routing configuration

You can view the routing configuration using the **routing** tab.

Procedure

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

In this screen, the output routing channel is identified within each icon, as shown in the following figure. 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 69: View routing configuration



2. When you hover your mouse on any of the icons, the following information appears (as shown in the following figure):
 - 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 70: Hover mouse to display channel information



3.4.3 Configuring array delays

You can configure array delays using the **array delays** tab. This provides you with fine control that is not normally required. In most cases, the information entered in DAD or under the **configure room** tab should be used instead of this tab.

Procedure

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

The **surround speaker array delays** screen appears, as shown in the following figure. The Dolby Atmos Designer (DAD) 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 DAD file values or the values entered in the **configure room** tab.

2. When the **use configuration file values** box is not checked, you can enter the desired delay values and then click the **apply** button.

Figure 71: Surround speaker array delays screen

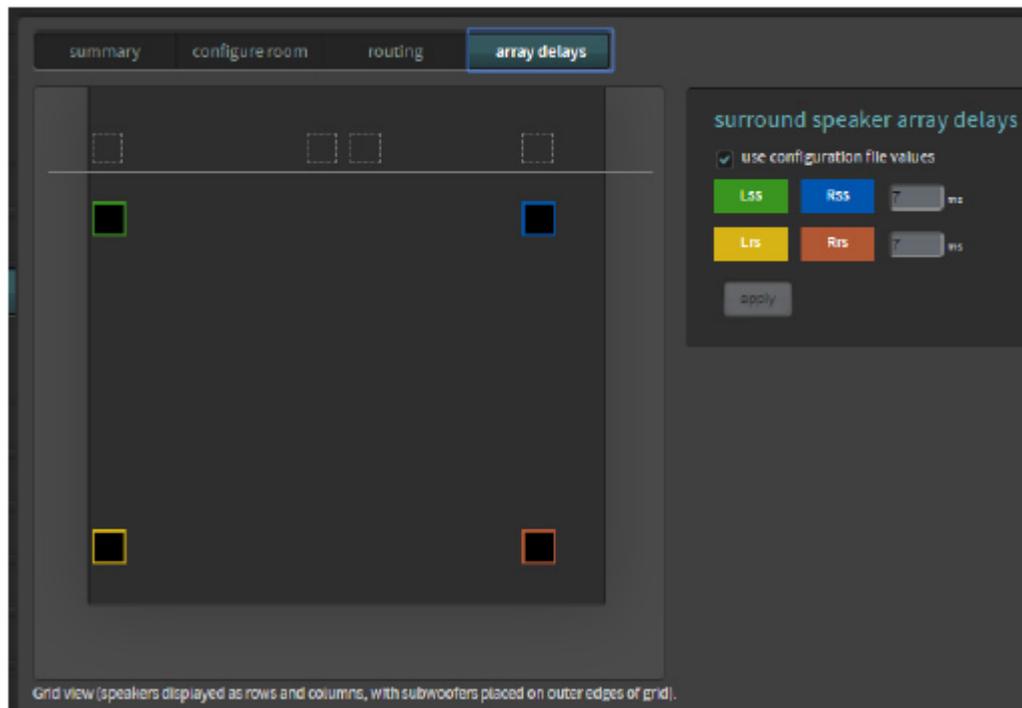
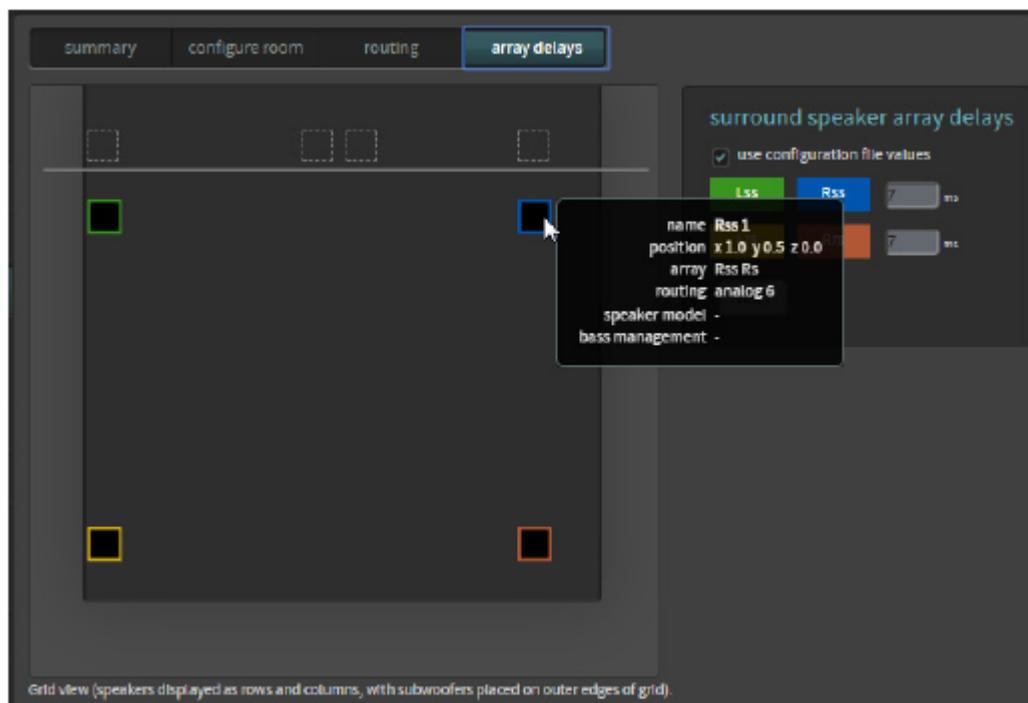


Figure 72: Hover mouse for additional information



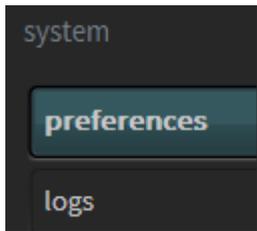
3.5 Configuring preferences

You can configure preferences using the **system** menu.

Procedure

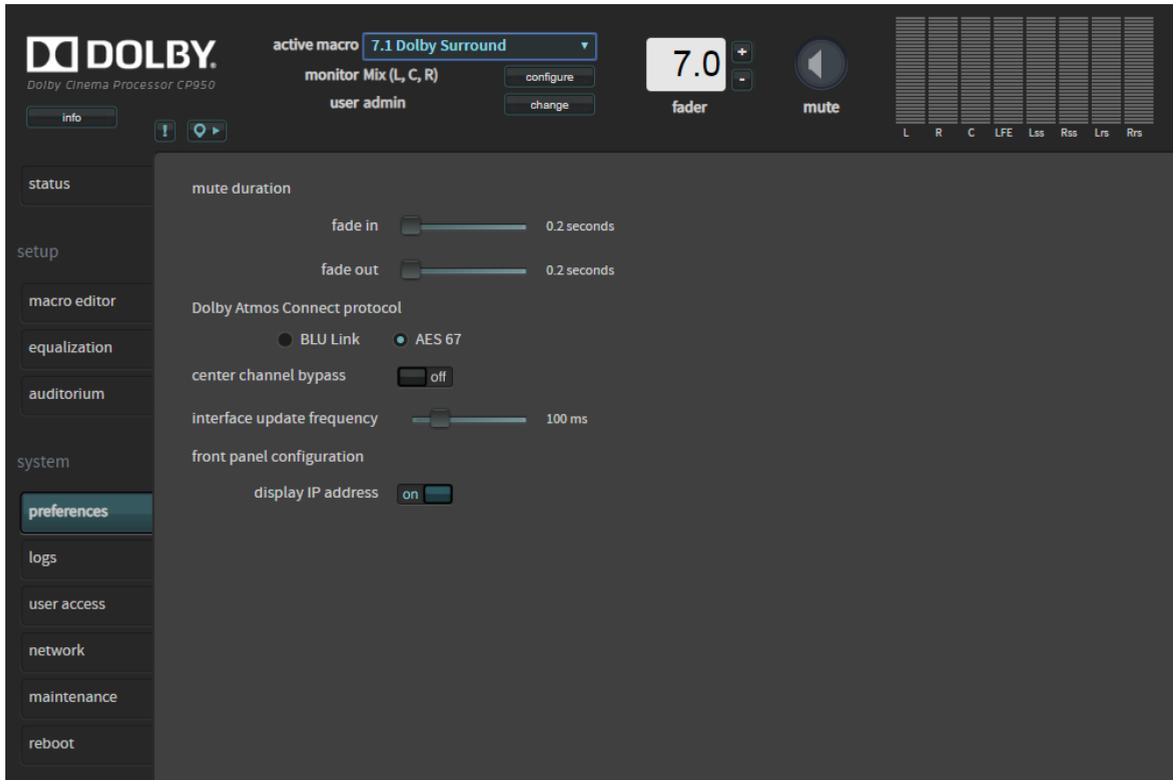
1. Select **preferences** in the **system** menu, as shown in the following figure.

Figure 73: Select preferences in system menu



The **preferences** screen appears, as shown in the following figure.

Figure 74: Preferences screen



2. Enter the Dolby CP950 fade-in and fade-out values when switching macros (or muting) under **mute duration**. 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.

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.

 **Note:** Changing this setting from one value to another may cause a brief loss of sound in the auditorium, as the system realigns to the new setting. We do not recommend changing this setting while guests are in the auditorium.

3. Under **Dolby Atmos Connect protocol**, select between **AES67** or **BLU Link** protocols for the Dolby CP950 digital outputs. You can use only one of these protocols at a time.

 **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 **1× AES IN B** BNC input for a word clock. When you select a current macro, the valid 48 kHz word clock signal must be present on this BNC 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.

4. If there is a problem with the center channel speaker, enable **center channel bypass** by clicking its **on/off** button, which toggles between **on** and **off**.

Enabling the bypass (**on**) sends center channel audio to the left and right speakers. You can run in this mode until the center channel speaker problems are resolved.

5. If your network connection is slow, specify the **interface update frequency** by moving the respective slider. This setting allows you to indicate how many updates per second the web client UI sends.

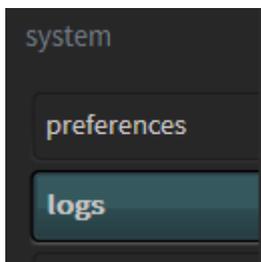
If your network connection is slow, you can increase this value using the slider, which has a range of 50 ms (fast updates) to 10,000 ms (slow updates). Slower updates result in a more responsive user interface, but less updates to the audio meters. Connecting over the network to the CP950 (locally, or remotely) results in a web client update at the specified frequency.

6. If you want to specify whether the FPUI displays the CP950 IP address, click the **front panel configuration > display IP address on/off** button, which toggles between on and off. This option is provided, as some customers do not want the IP address displayed on the front panel user interface (FPUI).

3.6 Viewing and downloading the system logs

The logs display information regarding the Dolby CP950 system. You can view the logs by clicking **logs** in the **system** menu at the left side of the screen, as shown in the following figure, 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 75: Select logs



The **logs** screen appears, as shown in the following figure. 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 Dolby CP950 status.

You can use the Dolby Log Analyzer (<http://loganalyzer.dolbycustomer.com/>) to import log files and obtain useful information to diagnose common problems.

Figure 76: Event logs screen

The screenshot shows the Event Logs screen in the Dolby Cinema Processor CP950 web client. The interface includes a top navigation bar with 'active macro 5.1', 'monitor Mix (L, C, R)', 'user admin', and '7.0 fader mute'. Below this is a sidebar with various system settings. The main content area is a table of event logs. The table has the following columns: Date, Level, Category, and Message. The 'logs' option is selected in the sidebar. At the bottom right, there is a 'Download logs' button.

Date	Level	Category	Message
2018-12-09 23:59:59,858	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:59:30,138	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:59:00,351	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:58:30,633	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:58:00,896	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:57:31,118	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:57:01,437	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:56:31,645	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:56:01,919	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:55:32,152	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:55:02,371	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:54:32,594	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0
2018-12-09 23:54:02,908	Info	System Manager	rpc.ParameterManager - Message received: ForcePcmControlMessage - response -- forcePCM: 0

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 the following figure.

Figure 77: Level menu



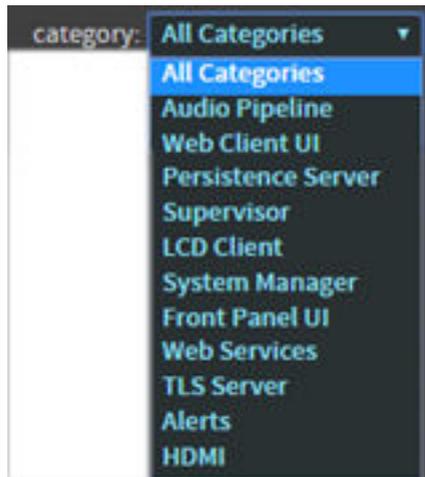
You can display all of these user log levels or only one of these user log levels:

- **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 the following figure. These items allow you to display events from a specific system component.

Figure 78: 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 check mark to display the specified log. If you click the x, 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 79: Start time/end time fields



3.7 Setting up user access

You can set up user access for your login and other users' logins as follows:

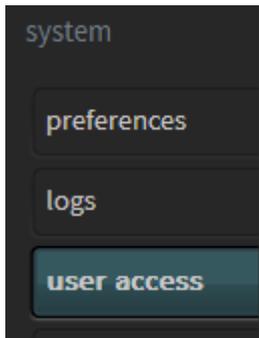
About this task

You need administrator privileges to set up user access.

Procedure

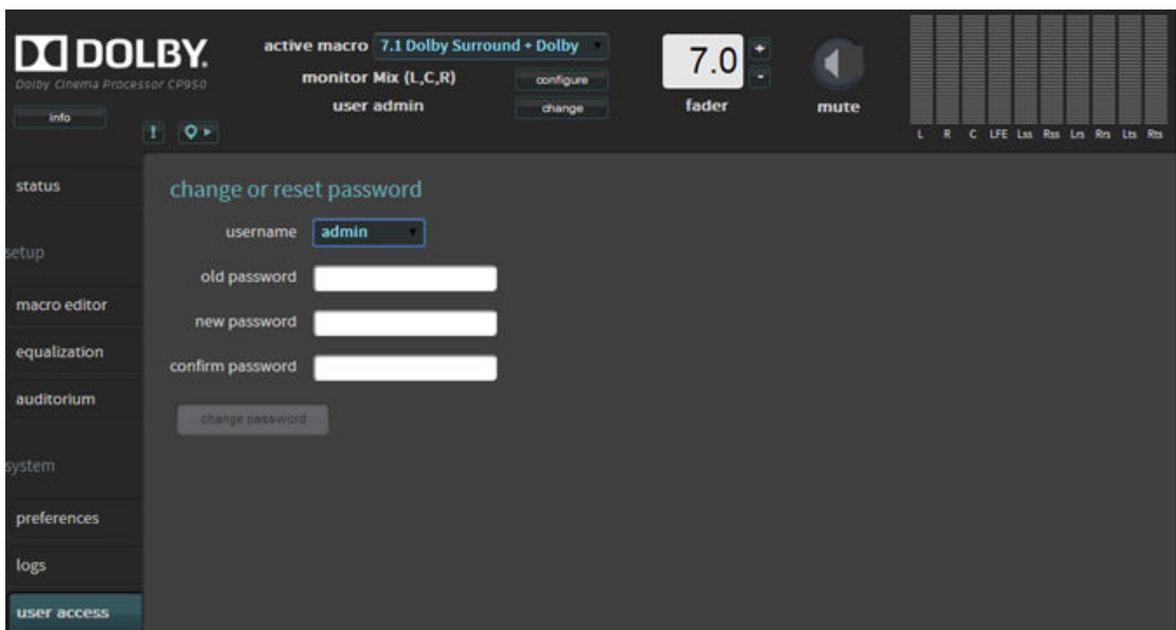
1. Select **user access** in the **system** menu, as shown in the following figure.

Figure 80: 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. The other access levels have default passwords that match their logins (technician/technician, manager/manager, operator/operator).

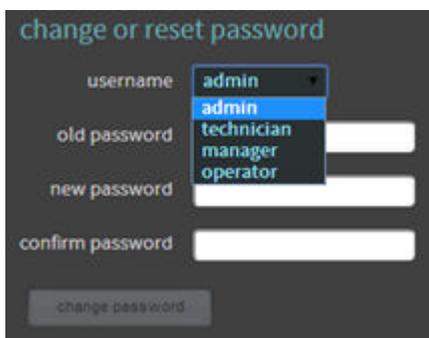
Figure 81: User access screen



2. Click the **username** field.

The **username** menu appears with a list of all user levels, as shown in the following figure.

Figure 82: Username menu



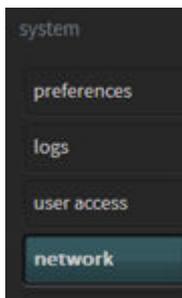
3. Select a user name, enter the old password, enter the new password, and then confirm the new password in the respective fields.

- The default passwords are the same as the user names. Following 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, and change the operator- and manager-level passwords.
 - **admin**: Access all technician-level tasks, and change the operator-, manager-, and technician-level passwords.

3.8 Modifying the network settings

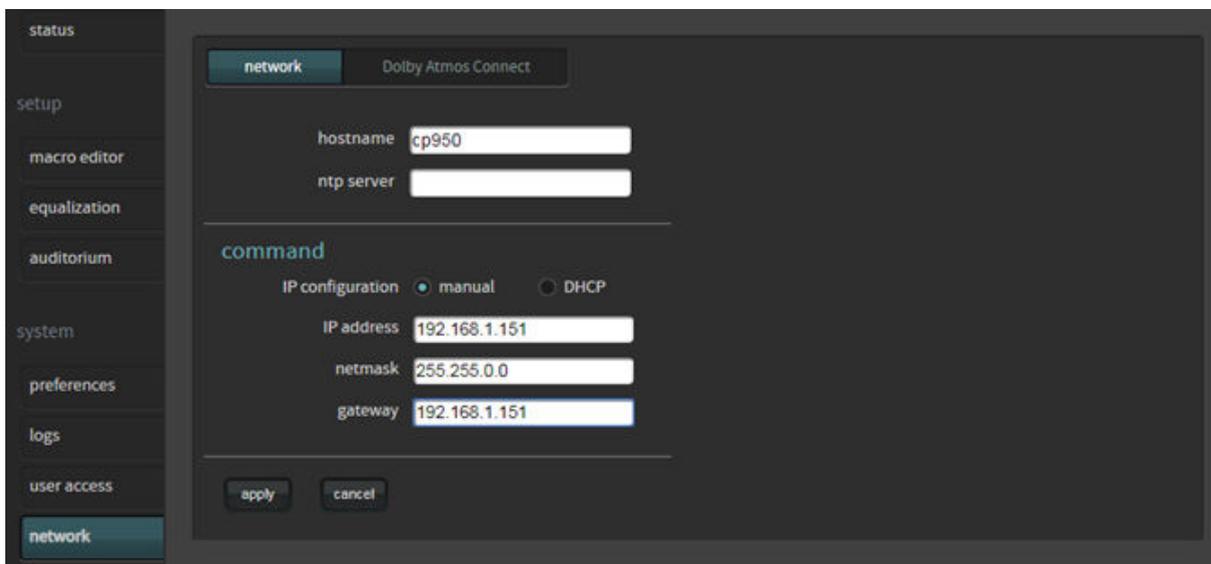
To modify the network settings, select **network** in the **system** menu.

Figure 83: Select network



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 84: Modifying the network settings



If you click the **Dolby Atmos Connect** tab, you can change the Dolby CP950 digital output settings. These parameters default to **legacy mode** with AES67, 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 85: Setting up Dolby Atmos Connect parameters (legacy mode)

network **Dolby Atmos Connect**

legacy mode

static source IP

PTP domain number

PTP priority 1

PTP priority 2

destination multicast IP

source UDP port

RTP destination UDP port

RTCP destination UDP port

unique RTP destination UDP ports

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

Figure 86: Setting up Dolby Atmos Connect parameters (non-legacy mode)

DOLBY
Dolby Cinema Processor CP950

active macro 5.1

monitor Mix (L, C, R)

user admin

7.0

L R C LFE Lss Rss Lrs Rrs

status

setup

macro editor

equalization

auditorium

system

preferences

logs

user access

network

maintenance

network **Dolby Atmos Connect**

legacy mode

static source IP

PTP domain number

PTP priority 1

PTP priority 2

destination multicast IP

1-8 9-16

RTP source UDP ports

RTP destination UDP ports

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 in a cinema complex 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. For example, you can set one auditorium to 109, the next auditorium to 110, and so on.

PTP priority specifies the most trusted clock. A lower number device is trusted more than a higher number. You should set PTP priority 1 to 127. This is the default setting and correctly sets the DolbyCP950 as the highest priority clock in the AES67network with other Dolby devices that use 128 or a higher priority. You should use PTP priority 2 to specify the higher priority clock if there is a duplicate priority with PTP priority 1. 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 Dolby 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 Multichannel 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 unique destination multicast IP address for each auditorium.

RTP source and RTP destination UDP ports

The system transmits audio in streams of eight channels. The Dolby 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 User Datagram Protocol (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 RTP Control Protocol (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**.

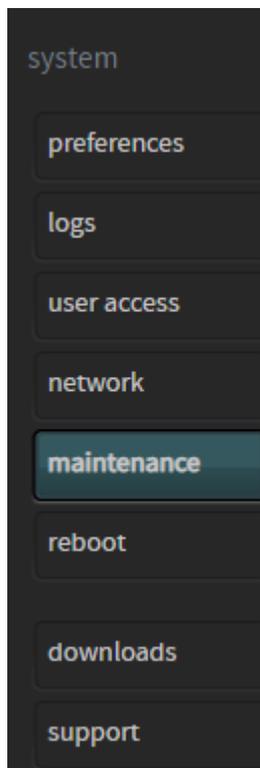
Unique RTP destination UDP ports

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

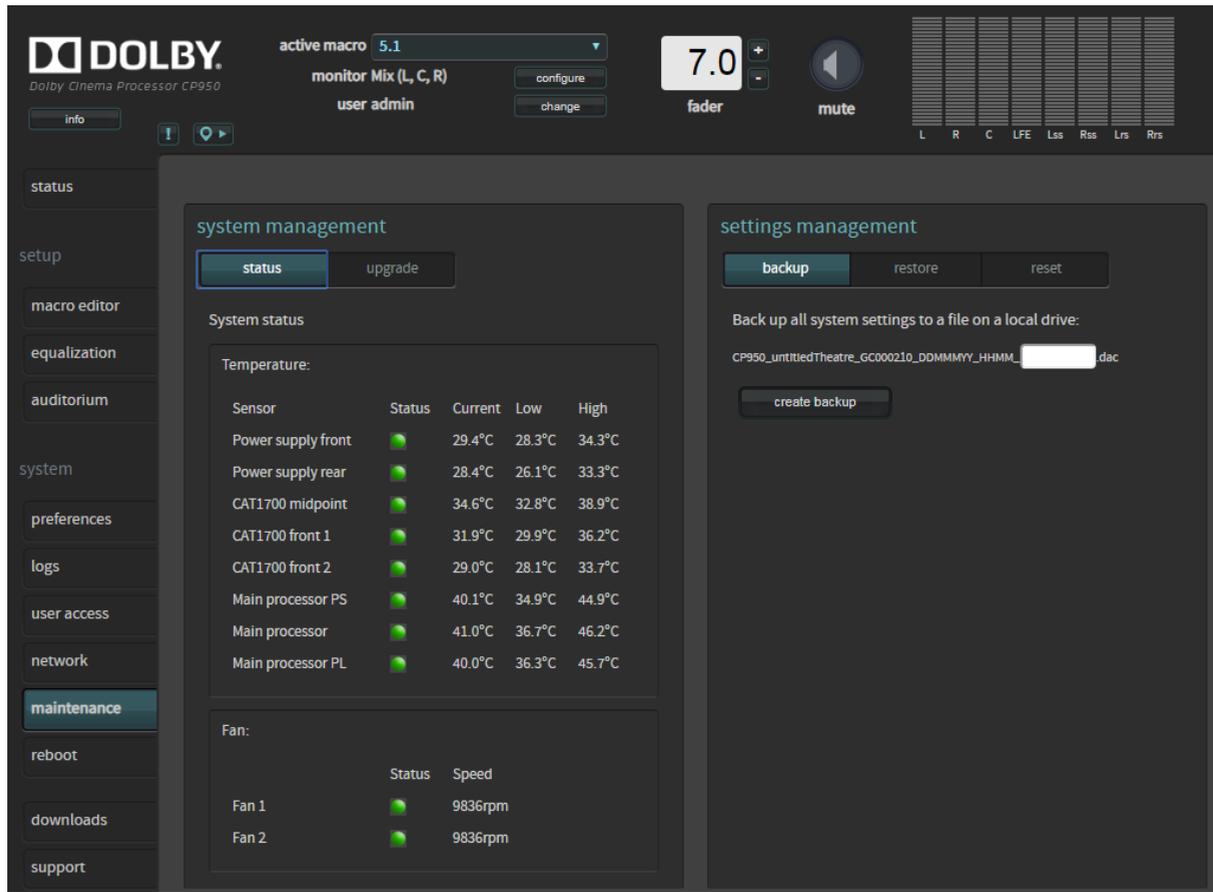
If you are a technician or a system administrator, select **maintenance** in the **system** menu to perform maintenance tasks, as shown in the following figure.

Figure 87: Select maintenance



The **maintenance** screen appears with the **status** tab activated in the **system management** pane, as shown in the following figure. When the **status** tab is selected, you can check the system status for current component temperatures, low and high component temperatures for the current boot cycle, and the state of fans 1 and 2. Green illumination is good, while red indicates an error. In addition, you can upgrade the system by clicking the **upgrade** tab in the **system management** pane, and backup, restore, and reset system settings in the **settings management** pane, as described in the following sections.

Figure 88: Maintenance screen



3.9.1 Upgrading the Dolby CP950 system software

You can upgrade your Dolby CP950 system software in the **maintenance** screen.

Procedure

1. Obtain the *.dlb* upgrade file from Dolby Laboratories at www.dolbycustomer.com.
2. Copy the upgrade file to your local disk.
3. Click the **upgrade** tab in the **maintenance > system management** pane.
4. Click **choose file**, select the upgrade file on your local disk, and then click **upload**.
5. Confirm the displayed upgrade file version, then click **install upgrade**.

The system initiates the upgrade process, displays the progress, and reboots the Dolby CP950 when the upgrade is completed.

3.9.2 Backing up system settings

You can back your system settings in the **maintenance** screen. During a backup, all system settings are saved to a file.

About this task

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

- 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)

Procedure

1. Click the **backup** tab in the **maintenance > settings management** pane.
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.

3.9.3 Restoring system settings

You can restore your system settings in the **maintenance** screen.

About this task

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

Procedure

1. Click the **restore** tab in the **maintenance > settings management** pane, then click **Choose File** to select a *.dac* restore file.
2. Click the **restore** button at the lower-left side of the **settings management** pane to run the restoration process.

3.9.4 Resetting the system settings

You can reset your system settings in the **maintenance** screen.

About this task

The reset tool enables you to clear the current Dolby 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.

Procedure

1. Click the **reset** tab in the **maintenance > settings management** pane.
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-left side of the **settings management** pane to run the reset operation.

3.10 Rebooting the system

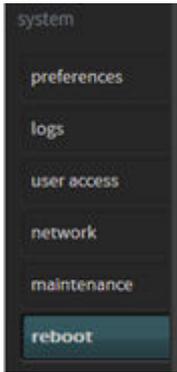
You can reboot the system from the **system** menu.

Procedure

If you have technician- or administrator-level access, you can reboot the Dolby CP950 by clicking **reboot** in the **system** menu, as shown in the following figure, 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 89: Reboot



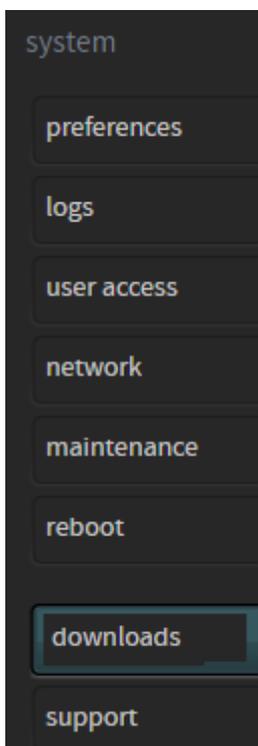
3.11 Downloading CP950 essentials

You can access essential items by clicking **downloads** in the **system** menu.

You can access:

- This CP950 manual.
- Web services WSDL document that provides information for controlling the CP950 using an application programming interface (API). This information is provided for the updated API version 2.0. This version supports version 1.1, which is backward compatible with the CP850. Commands are included in this web services file.
- 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
- End-user License Agreement (EULA)

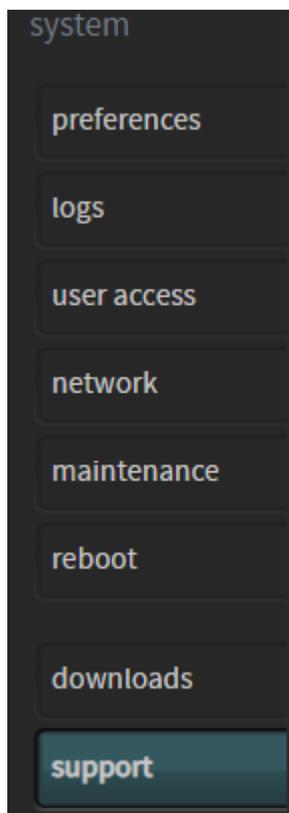
Figure 90: Select downloads in system menu



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 91: 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:

1. Equalize an auditorium with the Dolby 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 Dolby CP950 Grossman eq, which allows you to zoom in and make finer adjustments).
2. 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 Dolby 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).
3. Create a room configuration using DAD and use Dolby AutoEQ, which is similar to the Dolby CP850 EQ, to equalize the room.

 **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:

- Use the front panel UI (FPUI) to change the default IP address to your cinema networking standard and connect to the Dolby CP950 web client using Google Chrome version 71.x or later (for best results).
- Check the Dolby CP950 software version by clicking **info** at the upper left corner of the web client. If the version is not up to date with the current Dolby 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 3.2.10 or higher.

You can download the current version of DAD software by clicking **downloads** in the Dolby 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.

Select the method you are using to configure the equalization parameters.

- [Configuring equalization with the Dolby CP950 Real-Time Analyzer](#)
- [Using Dolby Atmos Designer and one-third octave EQ](#)
- [Configuring a room using Dolby Atmos Designer and AutoEQ](#)

4.1 Configuring equalization with the Dolby CP950 Real-Time Analyzer

This section explains how to use the Dolby CP950 web client UI to configure a room and equalize the auditorium. Following the steps in this section will help you configure a room that does not use any internal crossovers and is very similar to a Dolby CP750 configuration and equalization.

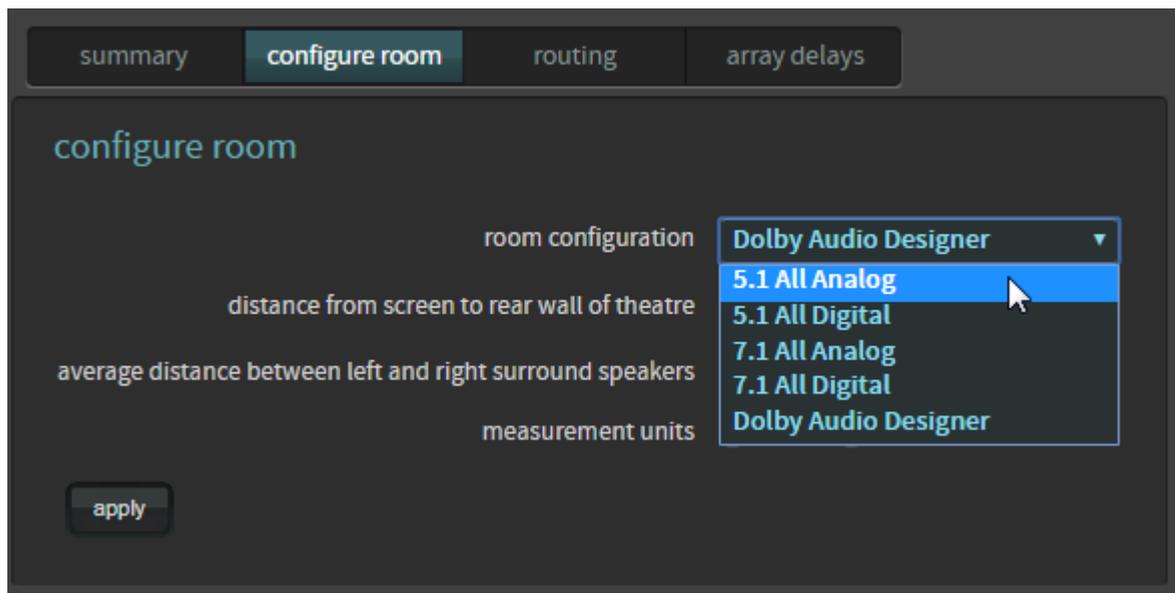
4.1.1 Configuring a room

You can configure a room with the Dolby CP950 Real-Time analyzer.

Procedure

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 92: Configure room screen drop-down menu



When you use the Dolby CP950 Real-Time analyzer, you can select a room configuration for:

- **5.1 All Analog:** Three screen channels (L, C, R), one subwoofer (Low-Frequency Effects (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 are listed in the following table.

Table 2: Outputs for analog and digital 5.1 configurations

Speaker	Analog (top connector)	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 are listed in the following table:

Table 3: Outputs for analog and digital 7.1 configurations

Speaker	Analog (top connector)	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 exactly where you have physical speakers. This is normal, as the speakers are spread across a wall surface and a precise display of the speakers is not needed. The speaker icon primarily shows the output channel. You can see an example in the following figure.

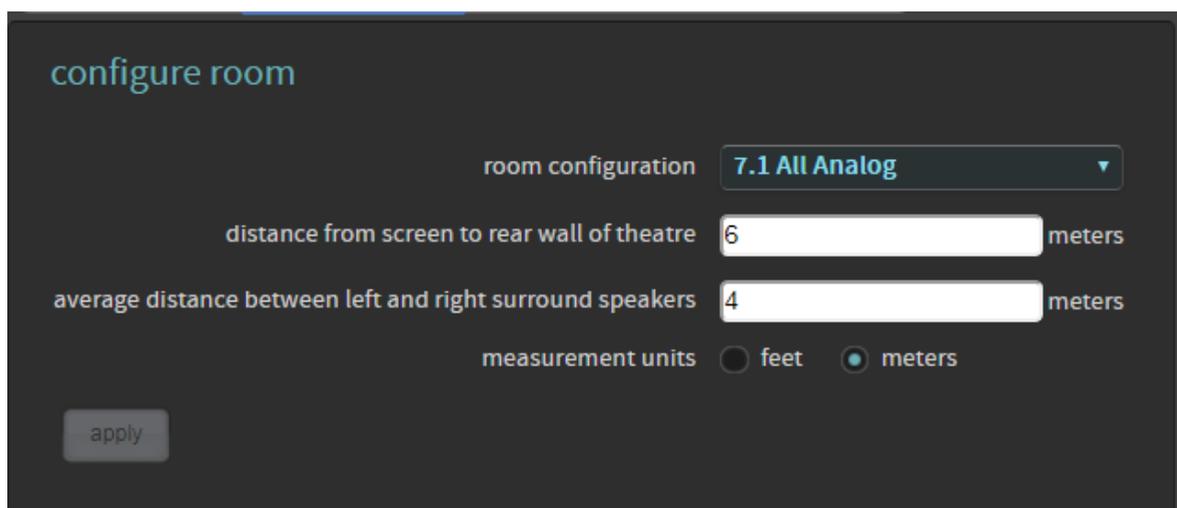
Figure 93: Default Speaker Positions for 7.1 Room



3. 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 Dolby CP750 room configuration. This enables the system to determine the correct surround speaker delay. You can toggle this entry between feet and meters and can enter only whole numbers (no fractions or decimals).

Figure 94: 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.

Related information

[Configuring a digital output](#) on page 75

[Using the Internal or External Real Time Analyzer](#) on page 75

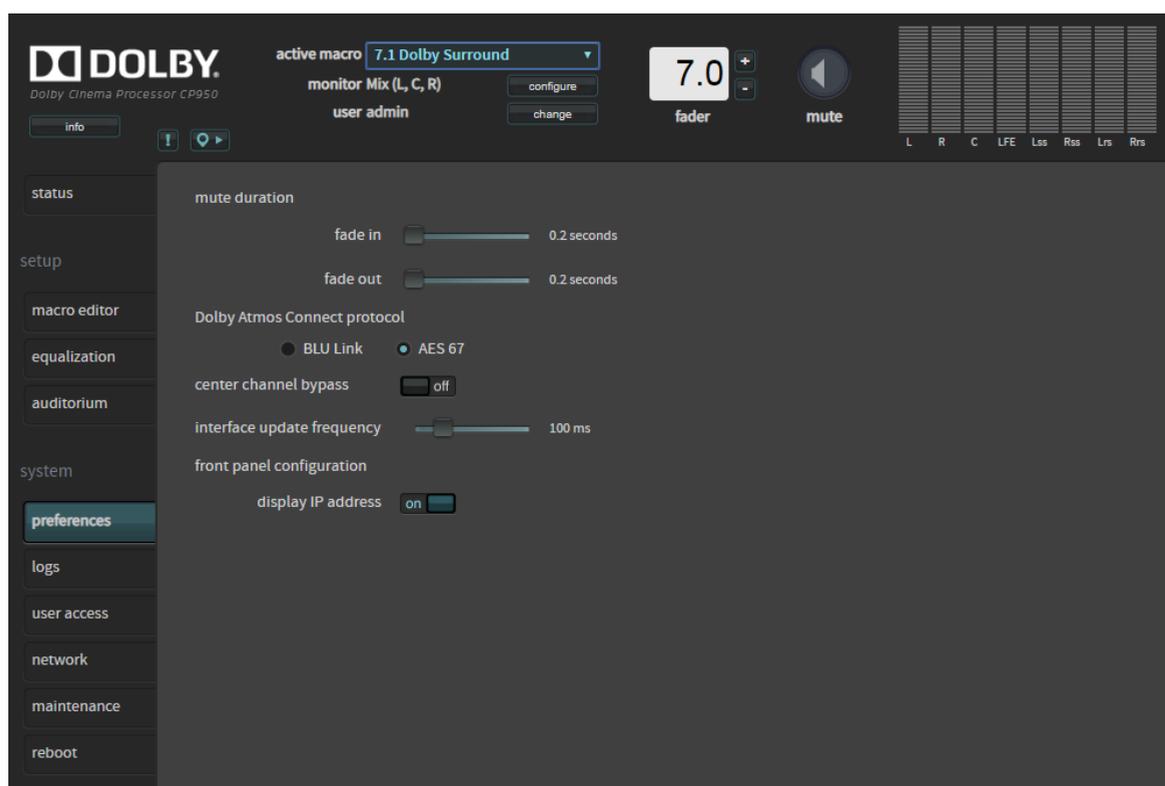
4.1.2 Configuring a digital output

You can configure a digital output.

Procedure

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

Figure 95: 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.

Related information

[Modifying the network settings](#) on page 63

4.1.3 Using the Internal or External Real Time Analyzer

You can use the Dolby CP950 internal real time analyzer (RTA) or an external (third party) RTA to achieve a frequency response that closely matches the x curve overlay (SMPTE 202M-2010).

Following is the RTA equalization sequence:

1. Coarse adjusting of each channel using the **bass & treble** sliders in the web client **equalization** screen.
2. Fine adjusting of each band using the 27-band one-third octave equalizer.
3. If necessary, fine tune adjusting using **Grossman eq**, as described later in this chapter.
4. Setting frequency Q (width) for LFE channel equalization and level of cut using the single-band parametric equalizer.

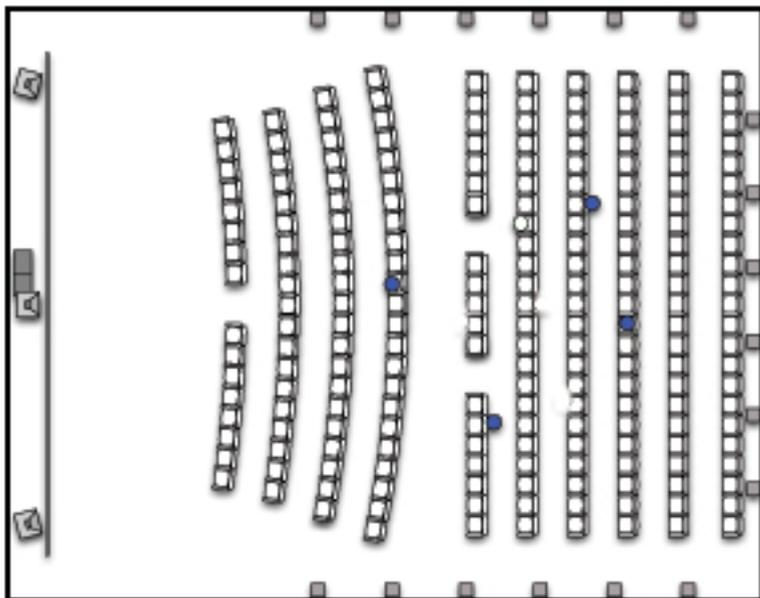
Required tools

- An RTA with four or more microphone inputs and averaging/muxing technology. A single microphone can be used instead, but it will not produce a result as effective as a four-microphone system. The Dolby CP950 can accept a single microphone input and can display the basic 1/3 octave EQ.
- A handheld Sound Pressure Level (SPL) meter or another device that can produce accurate SPL measurements. Measurements must be taken two thirds of the way back in the room, slightly off axis from center, and at ear height.
- High quality microphones that should all be the same make and model. The microphones should be from the same batch (similar serial numbers) so that they all produce similar sound results.

Setting up the RTA for 1-4 microphones

1. Position a microphone multiplexer in the center of the auditorium listening area.
2. Place each microphone in the reverberant field, not in an area that receives the most direct energy from the speakers. In addition, avoid perfect symmetry.
3. Arrange the microphones so that they do not form a square or rectangle parallel to the sides of the room, as shown in the following figure (microphones are represented by blue circles). Be sure not to place any of the multiplexing microphones on the auditorium center line. Standing waves and nodes can cause measurement errors.

Figure 96: Position four microphones



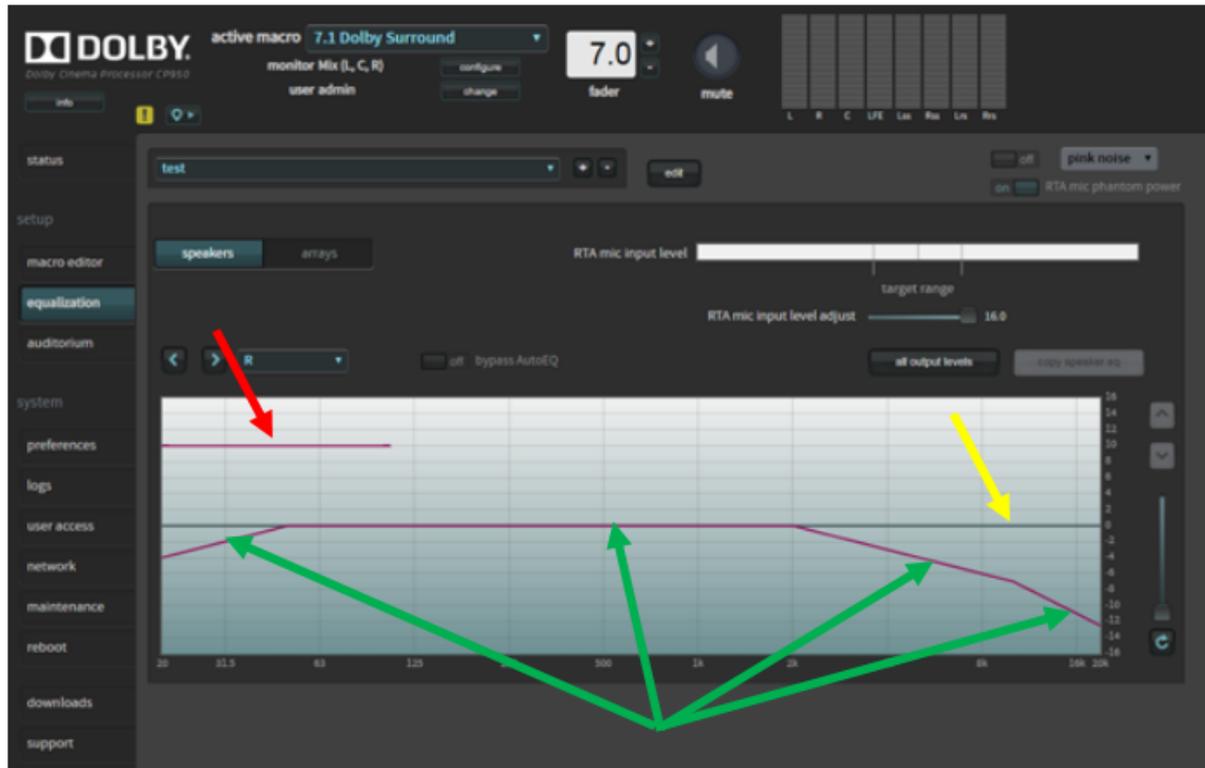
4. During final SPL calibration, position microphone number 1 two-thirds of the distance from the front speakers to the rear, at the exact side-to-side center of the room, approximately five feet above the floor level, and rotated 45 degrees upward toward the screen. (Some multiplexer microphones are designed to be pointed directly at the ceiling.) Placement of this microphone is important for output level adjustments.

Real time analyzer equalization

1. Begin with the system in the **7.1 Dolby Surround** macro (if the auditorium is configured for 5.1, use the **5.1 macro**).
2. Change the CP950 fader level to 7.0.
3. Select **equalization** in the web client navigation bar **setup** menu at the left side of the screen.

The real-time analyzer appears in the equalization screen, as shown in the following figure.

Figure 97: Real-Time analyzer equalization screen



The CP950 RTA displays several lines that can help you equalize each loudspeaker.

- The yellow arrow points to a line that indicates the applied EQ filter. This line will change as you apply gain or cut to the frequencies in the equalizer.
- The green arrows point to a magenta line that represents the x-curve, the target frequency response specified in SMPTE 202. Note that when you EQ larger rooms it may be necessary to adjust your target frequency response established in the SMPTE standard.
- The red arrow points to the target frequency response for the Low Frequency Effects (LFE) channel that is located behind the screen. This represents 10 dB of in-band gain over the center channel.

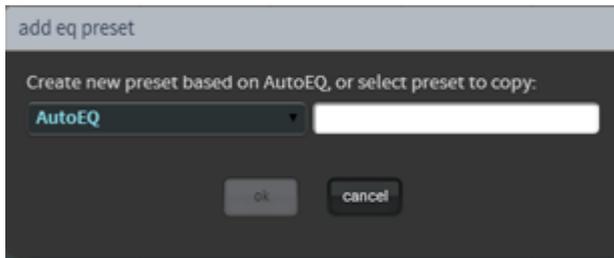
Note: The default EQ preset is **AutoEQ**. You cannot edit the **AutoEQ** preset parameters. However, you can save a copy of these parameters under a different name, and make changes to the copy.

To add a new EQ preset:

1. Click the plus (+) button.

You are prompted to base your new preset on either the **AutoEQ** preset or a copy of a previously created custom preset, as shown in the following figure. In either case, you must also enter a name for your new preset. Alternatively, you can create a new custom preset by following the instructions after step 4. This example uses **ams** as the preset name.

Figure 98: 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 EQ parameters are now activated for editing, as shown in the figure on the next page.

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

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

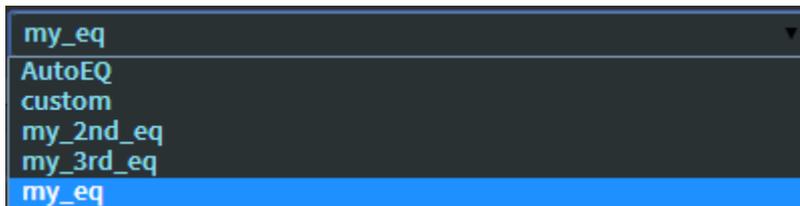
You can delete a customized preset by clicking the minus (-) button. You cannot delete the **AutoEQ** preset.

Loading or editing an EQ preset

To load an existing preset:

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

Figure 99: Load an EQ Preset

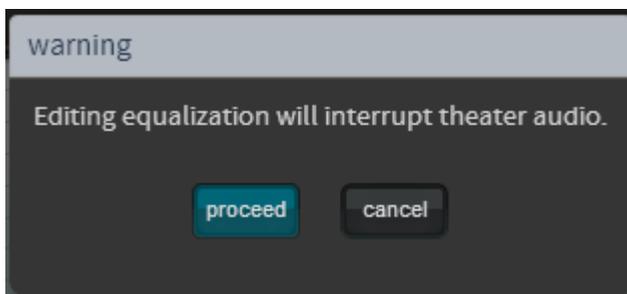


You can use the loaded preset for EQ, or you can edit the parameters for one of your customized presets, as described next.

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 100: Editing EQ 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 EQ parameters are now activated for editing, as shown in the following figure.

Figure 101: EQ Parameters Activated for Editing

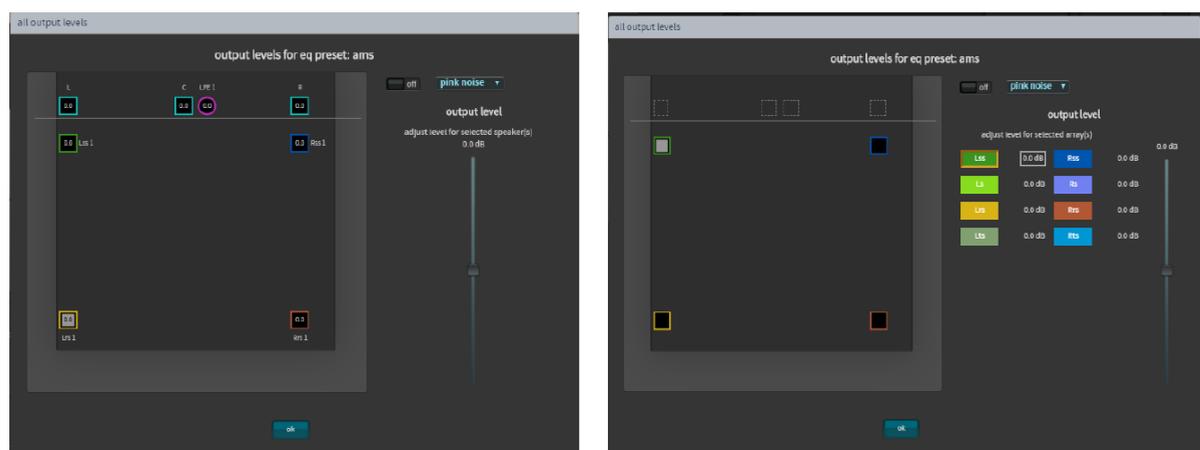


3. Configure the desired parameters in the **equalization** screen.
4. After configuring all of the desired parameters, click the **save** button to finalize your changes to the existing preset.

You can delete a customized preset by clicking the minus (-) button. You cannot delete the **AutoEQ** preset.

5. Click the **all output levels** button and verify that all speakers are set to 0.0.

Figure 102: All output levels screen (speakers and arrays)



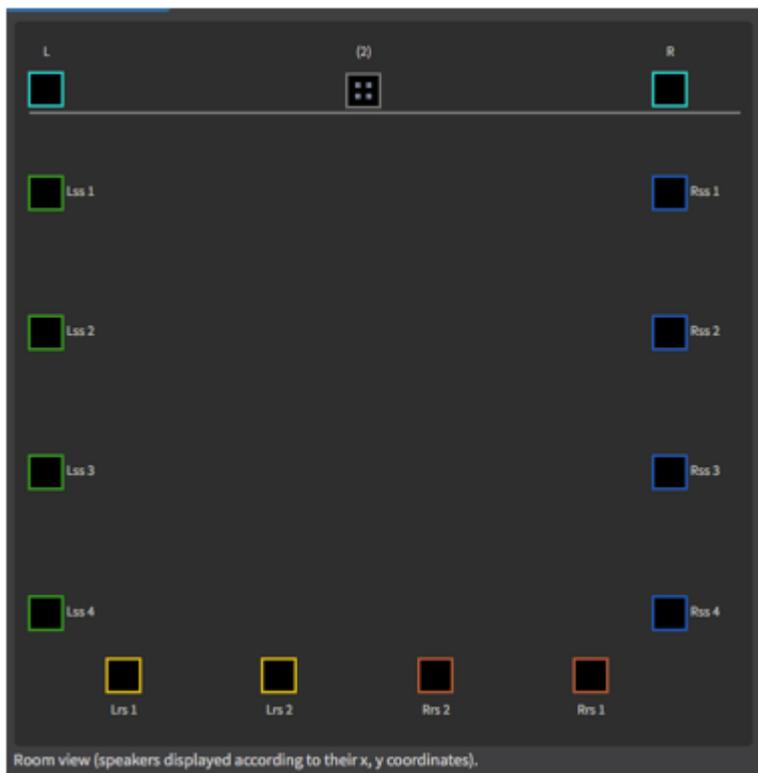
At this point, it is time to play pink noise from the speakers in the auditorium and set some basic levels. You may want to start with the amplifier inputs turned down.

1. Select **pink noise** from the signal generator and turn the signal generator **on** at the upper right-side of the screen. The selected speaker will output the test signal.
2. Take the SPL measurement at a location that is two thirds of the way back in the room and slightly to the left or right of center. View the SPL on your meter and proceed as follows:
3. For traditional analog amplifiers, increase the gains on all stage and surround speakers to 85 DBFS (slow) average. You should do this on each speaker or groups of speakers on a wall. With multiway speakers, you should add crossover filters at this time, reference the RTA, and then adjust the high and low frequencies to the same level for a more representative final x-curve.

 **Note:** If using a Dolby Multichannel Amplifier, first increase the outputs of the CP950 and then, if needed, increase the amplifier gains above 0 dB.

- Change the amplifier gains for the subwoofer to 91 dB, C-weighted, slow average. Note that in some instances, with subwoofers that include band-pass filtering, the SPL level could be different (89 dB).
- If you have more than one speaker feed on a wall (as shown in the following figure), you can press and hold the <Ctrl> key and select multiple speakers for pink noise output. This allows you to average the audio across the units in an array.

Figure 103: More than one speaker feed



- You should now set basic SPL levels for each speaker, or group of speakers using analog amplifier gains.
- Turn off the signal generator and close the **Output levels** window.
- To use the internal CP950 RTA, calibrate the **RTA mic input level** using your SPL meter. Take the SPL measurement at a location that is two thirds of the way back in the room and slightly to the left or right of center.

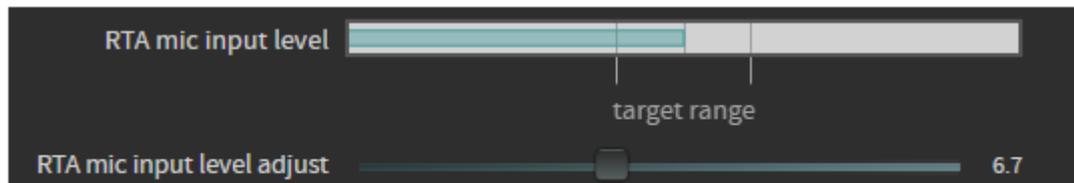
To adjust the **RTA Mic input level**:

1. Set the fader level to 7.0.

2. Turn on **pink noise** in the signal generator (pink noise is heard in the auditorium).
3. Using the previously described output levels control, adjust the output level for the center channel so 85 DBFS (slow) is measured on the external SPL meter.
4. The **RTA mic input level** meter has reference marks. The **target range** is marked between 40 and 60%. The 50% level is marked as the center of this range.
5. When the level is within the target range, increase or decrease the **RTA mic input level adjust** slider until the reading is as close to the 50% mark as possible. This is equal to the center channel output level at 85 DBFS (slow) and represents the overall reference level of 0 on the CP950 RTA display graph.

 **Note:** If your microphone has electronics that require +48V, to see activity on the CP950 RTA, you may need to click **on** for **RTA mic phantom power**.

- *Figure 104: CP950 RTA microphone level adjustment*



Move slider to 50% for target range - - - - - 

- The CP950 RTA should display results, as shown in the following figure. Be sure that you are measuring 85 DBFS (Slow) on your SPL meter.

Figure 105: Real-time analyzer display graph



 **Note:** On multiway speakers, you can adjust analog amplifiers to match the highs, mids, or lows to the x-curve as closely as possible.

- The **RTA mic input level** should show some activity. If the activity is low or does not appear, adjust the **MIC GAIN** on the CP950 rear panel to a level that is within the target range. The CP950 ships with a potentiometer trimmer, as shown in the following figure.

Figure 106: Potentiometer trimmer



- The web client UI also includes a digital trim that allows you to make fine adjustments.
- The system automatically saves the **RTA mic input level adjust** value in its last position and performs calibration at that level. You can now proceed with the EQ. You need to obtain the final levels after EQ is complete.
- It is now time to perform EQ for each individual speaker (or group of speakers on a single output). Refer to the RTA and adjust the 1/3 octave graphic EQ to bring the measured frequencies close to the x-curve line. Use industry best practices to make calibration decisions.

Note: For some multiway speakers, it may be better to adjust the amplifier gains. In some cases, a speaker may not be capable of producing very low or very high frequencies. For improved low frequencies on surround speakers, you can apply bass management. If the correct level on high frequencies is not reachable, you could add too much boost and wear out the drivers.

- After calibrating the individual speakers, you may need to calibrate speakers in an array. If you have only one speaker feed per wall, this is not needed (as shown previously for the output levels) and you can skip the next step.

4.1.4 Fine tuning with the Grossman eq

You can use the Grossman eq to fine tune room settings.

About this task

Grossman eq is an equalization 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 narrow band EQ. This tool displays an interface that provides users with the ability to utilize the one-twelfth octave capabilities of the Dolby CP950, Dolby CP850, and Dolby 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.

Procedure

1. 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 107: Grossman eq button



2. 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 108: 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 the Grossman equalizer 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

You can use the **flatten** button to set all visible bands to 0 dB gain.

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

You can view the results of the Grossman EQ.

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.

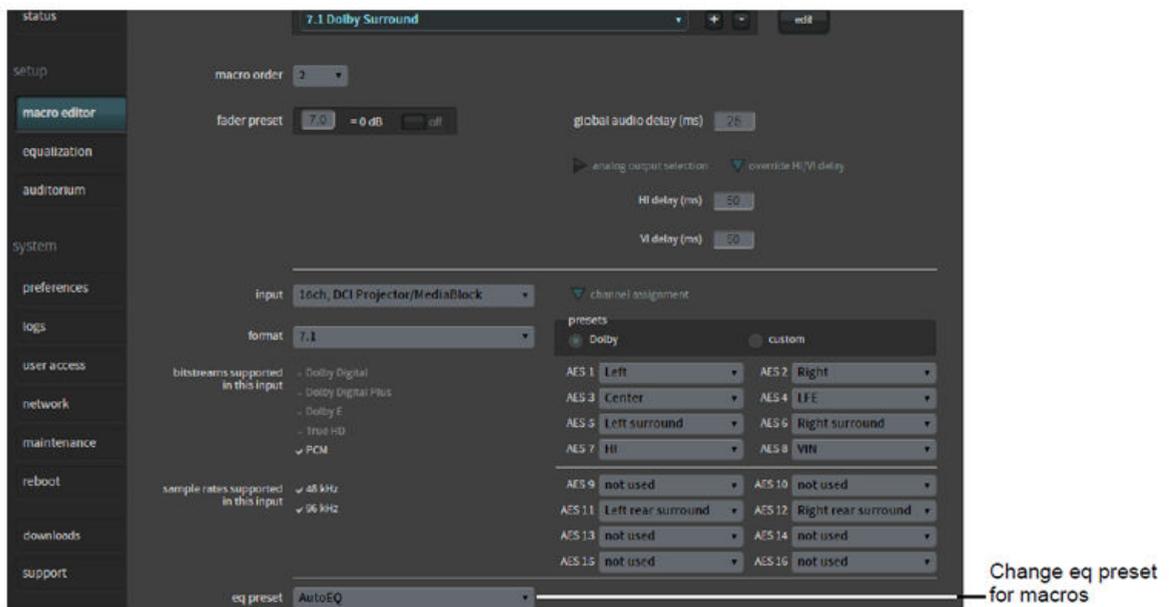
4.1.5 Configuring the macro editor

When your new EQ preset is finalized and completed, you can configure the macro editor.

Procedure

1. After equalizing the auditorium, click **macro editor** in the navigation bar.
2. Change the EQ preset for all of your current macros to the new preset you created.

Figure 109: Enter New EQ Preset for All Macros



4.1.6 Finalizing the equalization

You can finalize the equalization.

Procedure

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

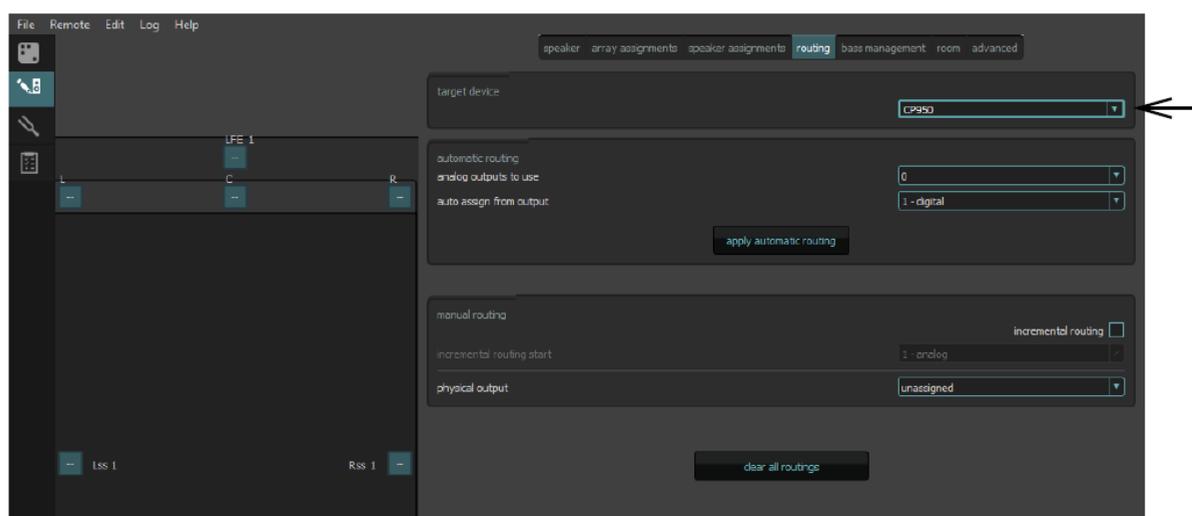
4.2 Using Dolby Atmos Designer and one-third octave EQ

You can use Dolby Atmos Designer (DAD) and standard one-third octave EQ to configure a room.

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. This configuration does not use the Dolby AutoEQ system.

You can connect to the Dolby CP950 in DAD version 3.2.10 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 **Dolby CP950**.

Figure 110: Select Dolby 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 Dolby 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: <http://www.vimeo.com/showcase/4989198/video/280122204>

Follow the instructions in the *Dolby Atmos Designer Manual* to set up a room configuration. This includes room dimensions, speakers, amplifiers, and so on. When you complete this setup, upload the room configuration to the Dolby CP950. The system is then ready for you to start the equalization process.

Related information

[Configuring a digital output](#) on page 86

4.2.1 Creating a room in Dolby Atmos Designer

You can create a room in Dolby Atmos Designer.

About this task

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 Dolby CP950. In DAD, it is not possible to mix different routing types (analog and digital) for multiway speakers.

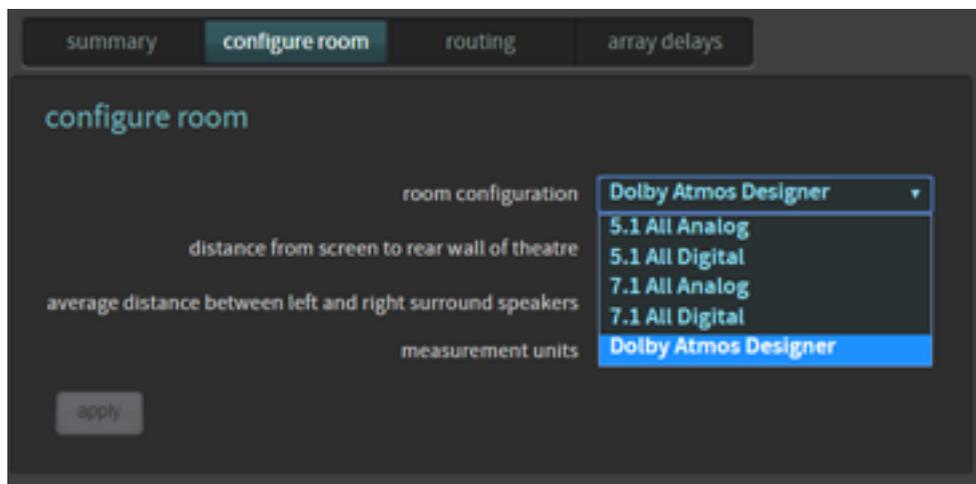
Note: To correctly set the surround speaker delays, your room configuration must use accurate measurements and speaker placements. If you are using one CP950 processor output to drive all speakers on a wall, use a point that is the average distance between the speakers.

After you create a room, save a copy of the DAD.dac file to your computer, and then:

Procedure

1. Push the room configuration to the Dolby CP950 using DAD.
2. Click **auditorium** in the Dolby 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.
3. To confirm that your settings are correct, click the **summary** or **routing** tab.

Figure 111: Dolby Atmos Designer Selected for Room Configuration



Digital users proceed to the next section (Section 4.2.2). Analog users can skip this next section and proceed to Section 4.2.3.

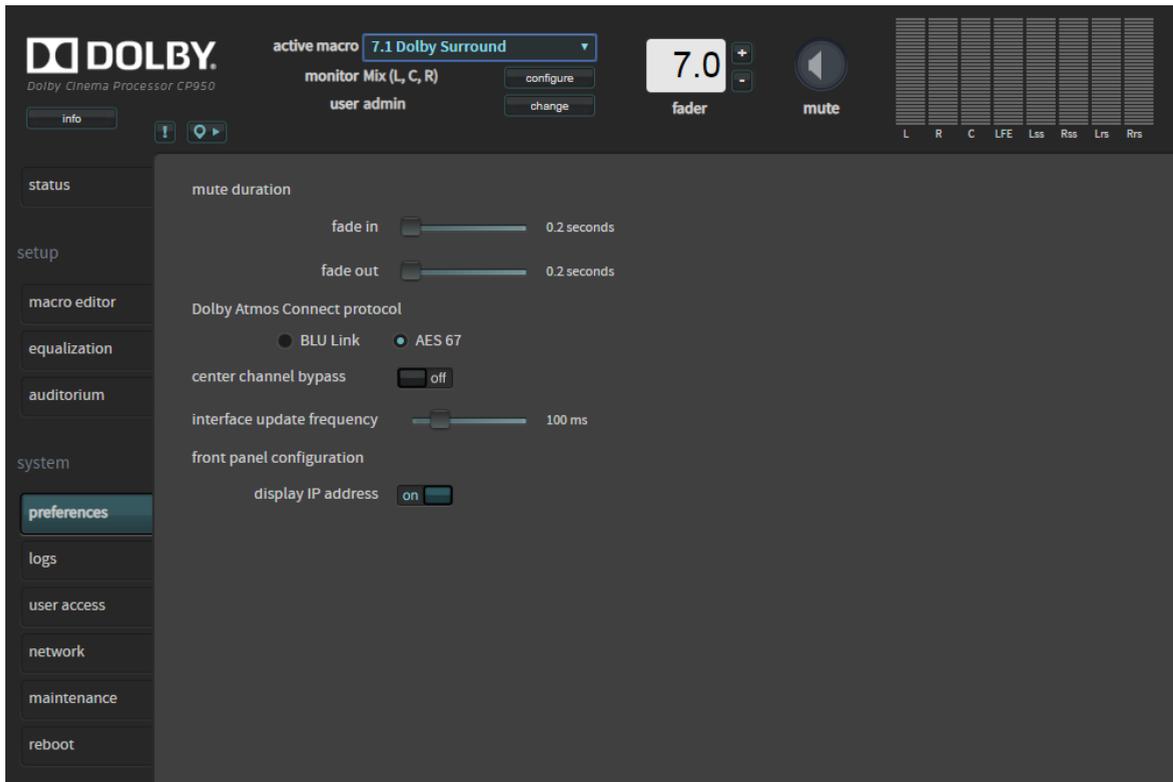
4.2.2 Configuring a digital output

You can configure a digital output.

Procedure

1. If you selected a digital output room configuration, the system default is **AES67**, which enables an easy connection to a Dolby Multichannel Amplifier.
2. 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** in the **preferences** screen under **Dolby Atmos Connect protocol** (refer to the following figure).

Figure 112: 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.

Related information

[Modifying the network settings](#) on page 63

4.2.3 Using the Internal or External Real Time Analyzer

You can use the Dolby CP950 internal real time analyzer (RTA) or an external (third party) RTA to achieve a frequency response that closely matches the x curve overlay (SMPTE 202M-2010).

Following is the RTA equalization sequence:

1. Coarse adjusting of each channel using the **bass & treble** sliders in the web client **equalization** screen.
2. Fine adjusting of each band using the 27-band one-third octave equalizer.
3. If necessary, fine tune adjusting using **Grossman eq**, as described later in this chapter.
4. Setting frequency Q (width) for LFE channel equalization and level of cut using the single-band parametric equalizer.

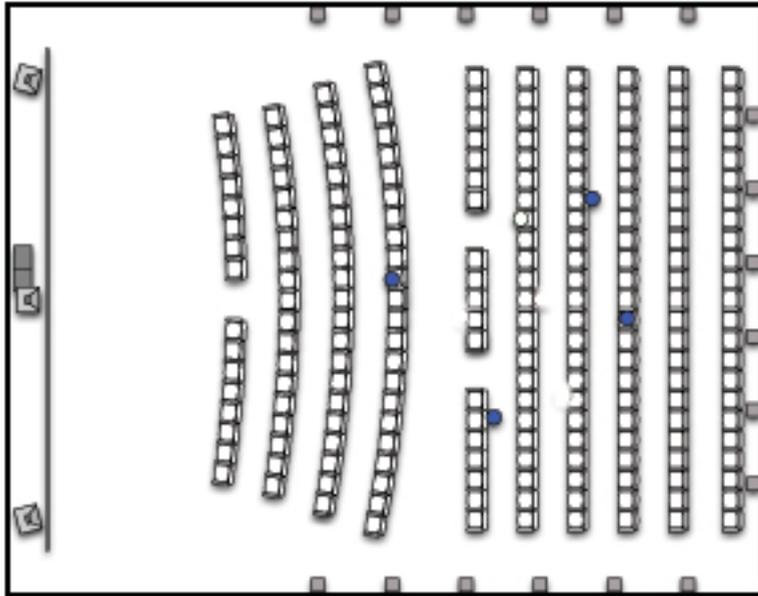
Required tools

- An RTA with four or more microphone inputs and averaging/muxing technology. A single microphone can be used instead, but it will not produce a result as effective as a four-microphone system. The Dolby CP950 can accept a single microphone input and can display the basic 1/3 octave EQ.
- A handheld Sound Pressure Level (SPL) meter or another device that can produce accurate SPL measurements. Measurements must be taken two thirds of the way back in the room, slightly off axis from center, and at ear height.
- High quality microphones that should all be the same make and model. The microphones should be from the same batch (similar serial numbers) so that they all produce similar sound results.

Setting up the RTA for 1-4 microphones

1. Position a microphone multiplexer in the center of the auditorium listening area.
2. Place each microphone in the reverberant field, not in an area that receives the most direct energy from the speakers. In addition, avoid perfect symmetry.
3. Arrange the microphones so that they do not form a square or rectangle parallel to the sides of the room, as shown in the following figure (microphones are represented by blue circles). Be sure not to place any of the multiplexing microphones on the auditorium center line. Standing waves and nodes can cause measurement errors.

Figure 113: Position four microphones



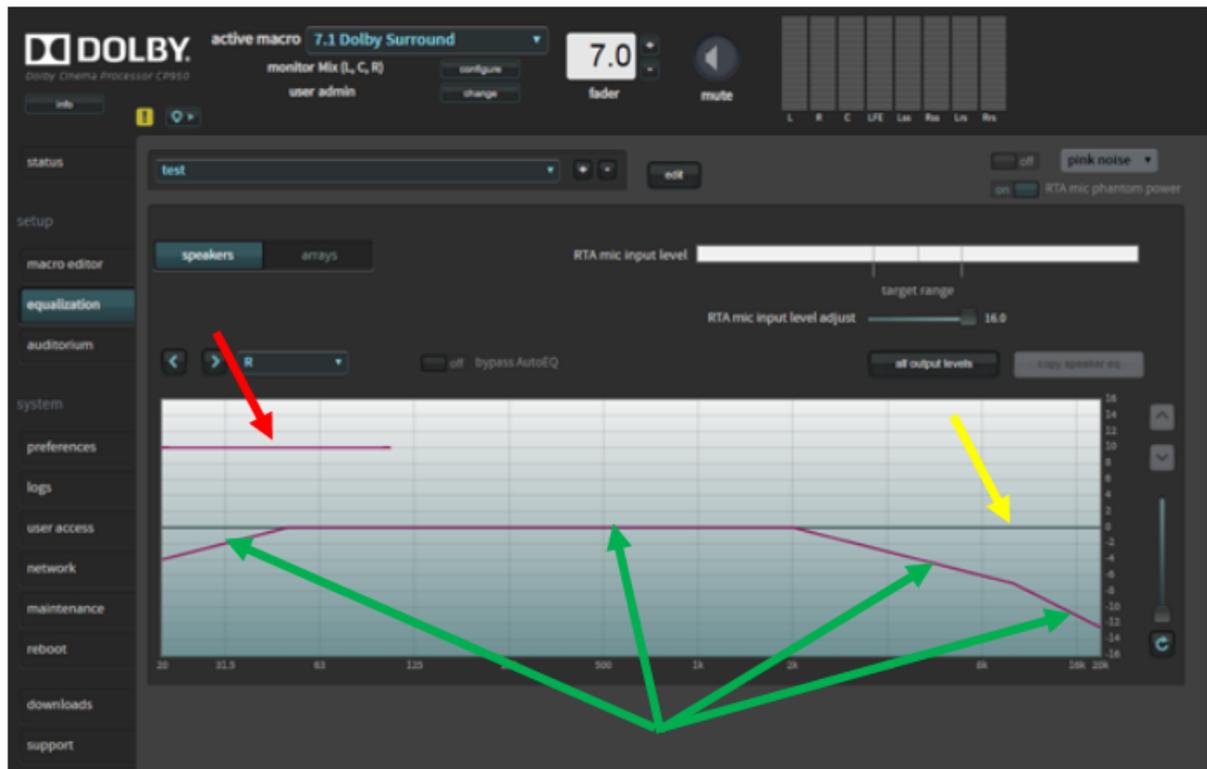
4. During final SPL calibration, position microphone number 1 two-thirds of the distance from the front speakers to the rear, at the exact side-to-side center of the room, approximately five feet above the floor level, and rotated 45 degrees upward toward the screen. (Some multiplexer microphones are designed to be pointed directly at the ceiling.) Placement of this microphone is important for output level adjustments.

Real time analyzer equalization

1. Begin with the system in the **7.1 Dolby Surround** macro (if the auditorium is configured for 5.1, use the **5.1 macro**).
2. Change the CP950 fader level to 7.0.
3. Select **equalization** in the web client navigation bar **setup** menu at the left side of the screen.

The real-time analyzer appears in the equalization screen, as shown in the following figure.

Figure 114: Real-Time analyzer equalization screen



The CP950 RTA displays several lines that can help you equalize each loudspeaker.

- The yellow arrow points to a line that indicates the applied EQ filter. This line will change as you apply gain or cut to the frequencies in the equalizer.
- The green arrows point to a magenta line that represents the x-curve, the target frequency response specified in SMPTE 202. Note that when you EQ larger rooms it may be necessary to adjust your target frequency response established in the SMPTE standard.
- The red arrow points to the target frequency response for the Low Frequency Effects (LFE) channel that is located behind the screen. This represents 10 dB of in-band gain over the center channel.

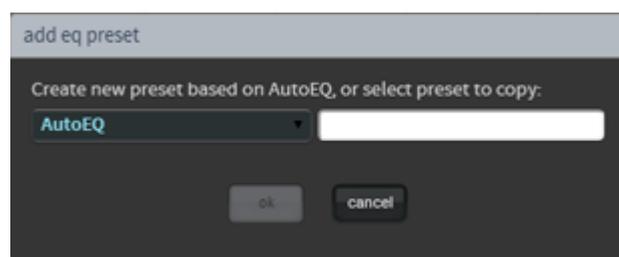
Note: The default EQ preset is **AutoEQ**. You cannot edit the **AutoEQ** preset parameters. However, you can save a copy of these parameters under a different name, and make changes to the copy.

To add a new EQ preset:

1. Click the plus (+) button.

You are prompted to base your new preset on either the **AutoEQ** preset or a copy of a previously created custom preset, as shown in the following figure. In either case, you must also enter a name for your new preset. Alternatively, you can create a new custom preset by following the instructions after step 4. This example uses **ams** as the preset name.

Figure 115: 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 EQ parameters are now activated for editing, as shown in the figure on the next page.

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

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

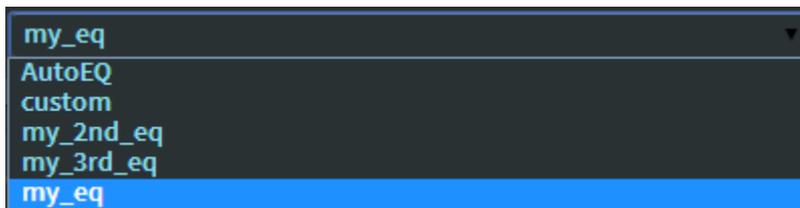
You can delete a customized preset by clicking the minus (-) button. You cannot delete the **AutoEQ** preset.

Loading or editing an EQ preset

To load an existing preset:

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

Figure 116: Load an EQ Preset

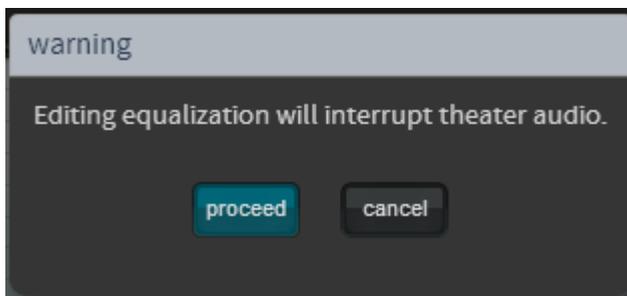


You can use the loaded preset for EQ, or you can edit the parameters for one of your customized presets, as described next.

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 117: Editing EQ Warning Message

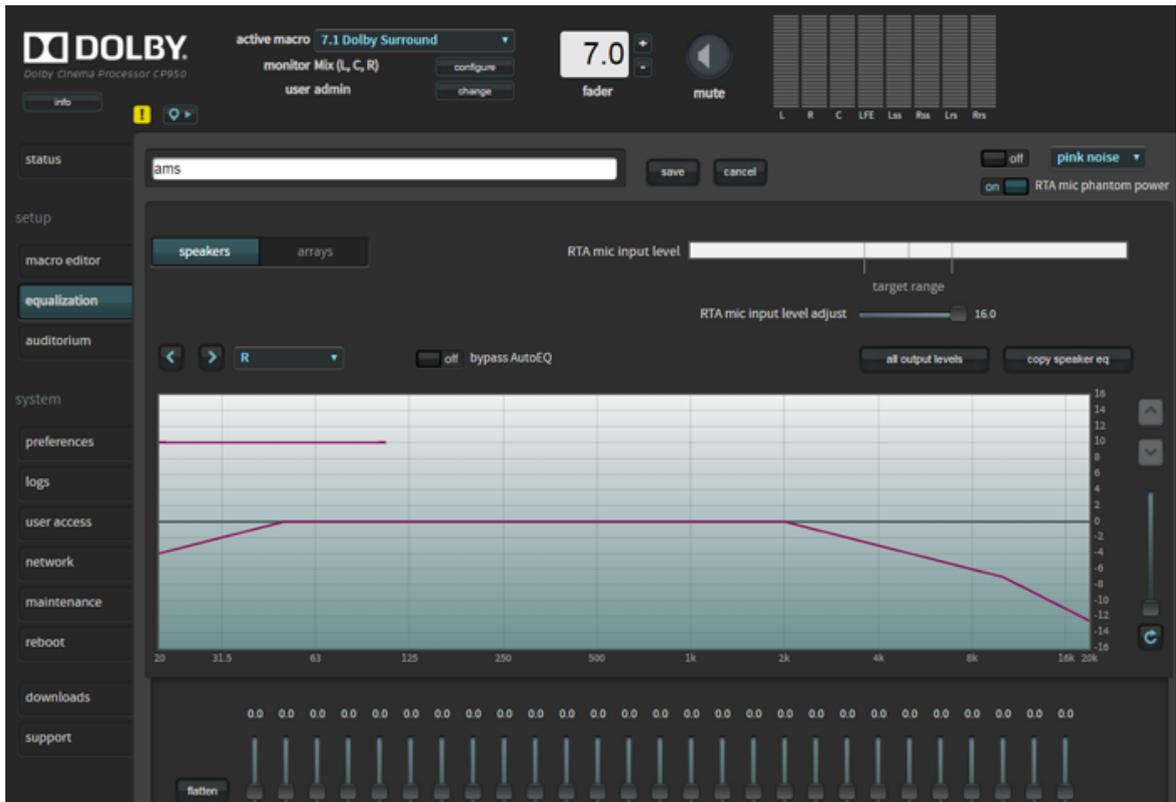


2. Click **proceed** to edit your preset.

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

The EQ parameters are now activated for editing, as shown in the following figure.

Figure 118: EQ Parameters Activated for Editing

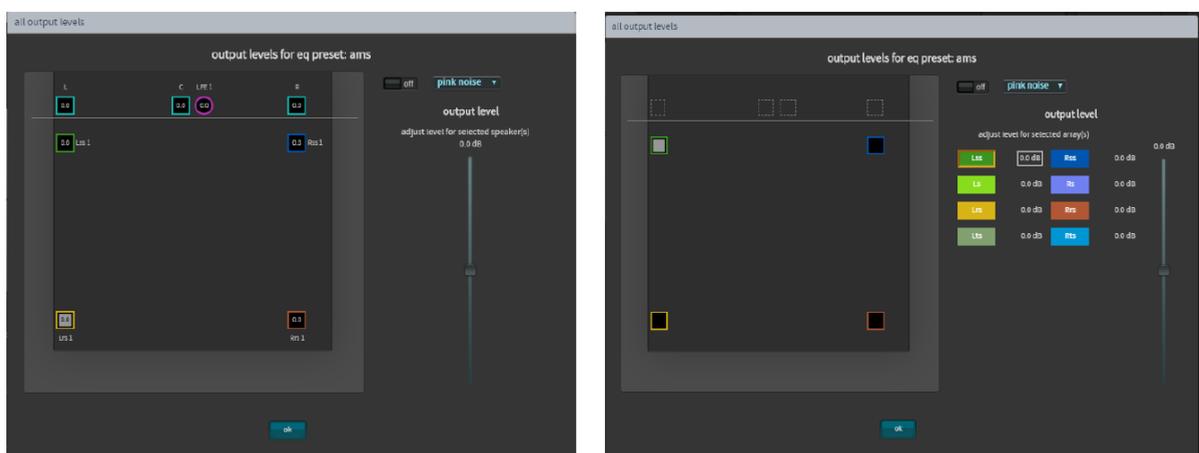


3. Configure the desired parameters in the **equalization** screen.
4. After configuring all of the desired parameters, click the **save** button to finalize your changes to the existing preset.

You can delete a customized preset by clicking the minus (-) button. You cannot delete the **AutoEQ** preset.

5. Click the **all output levels** button and verify that all speakers are set to 0.0.

Figure 119: All output levels screen (speakers and arrays)



At this point, it is time to play pink noise from the speakers in the auditorium and set some basic levels. You may want to start with the amplifier inputs turned down.

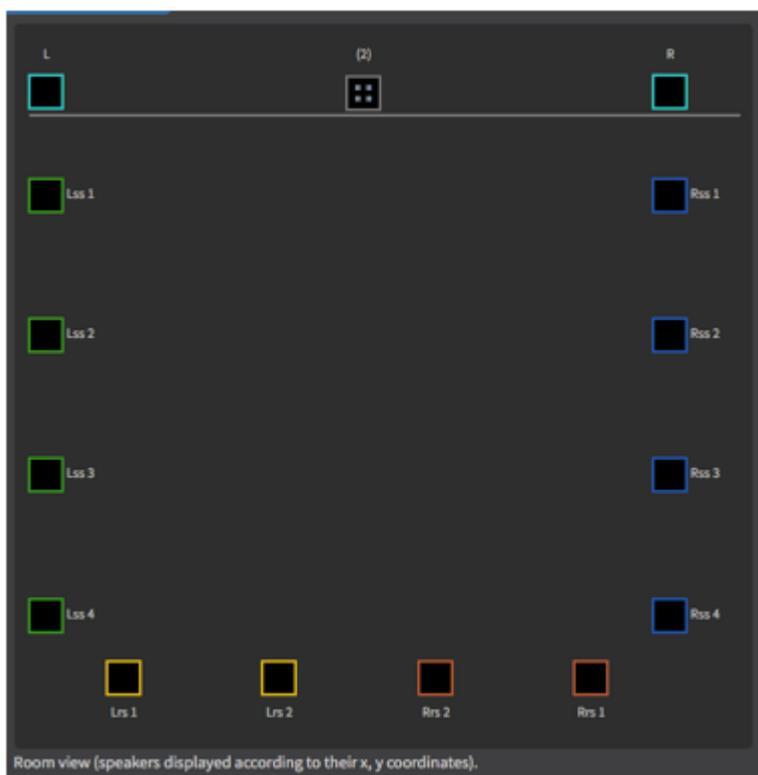
1. Select **pink noise** from the signal generator and turn the signal generator **on** at the upper right-side of the screen. The selected speaker will output the test signal.

2. Take the SPL measurement at a location that is two thirds of the way back in the room and slightly to the left or right of center. View the SPL on your meter and proceed as follows:
3. For traditional analog amplifiers, increase the gains on all stage and surround speakers to 85 DBFS (slow) average. You should do this on each speaker or groups of speakers on a wall. With multiway speakers, you should add crossover filters at this time, reference the RTA, and then adjust the high and low frequencies to the same level for a more representative final x-curve.

 **Note:** If using a Dolby Multichannel Amplifier, first increase the outputs of the CP950 and then, if needed, increase the amplifier gains above 0 dB.

- Change the amplifier gains for the subwoofer to 91 dB, C-weighted, slow average. Note that in some instances, with subwoofers that include band-pass filtering, the SPL level could be different (89 dB).
- If you have more than one speaker feed on a wall (as shown in the following figure), you can press and hold the <Ctrl> key and select multiple speakers for pink noise output. This allows you to average the audio across the units in an array.

Figure 120: More than one speaker feed



- You should now set basic SPL levels for each speaker, or group of speakers using analog amplifier gains.
- Turn off the signal generator and close the **Output levels** window.
- To use the internal CP950 RTA, calibrate the **RTA mic input level** using your SPL meter. Take the SPL measurement at a location that is two thirds of the way back in the room and slightly to the left or right of center.

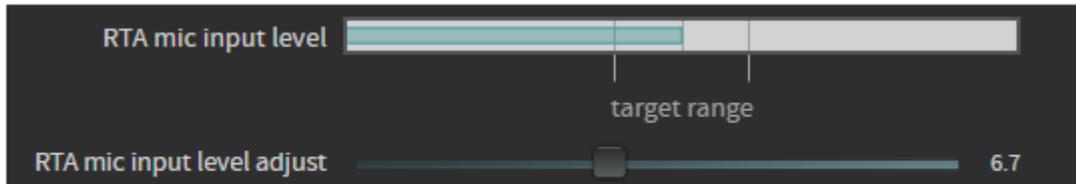
To adjust the **RTA Mic input level**:

1. Set the fader level to 7.0.
2. Turn on **pink noise** in the signal generator (pink noise is heard in the auditorium).
3. Using the previously described output levels control, adjust the output level for the center channel so 85 DBFS (slow) is measured on the external SPL meter.
4. The **RTA mic input level** meter has reference marks. The **target range** is marked between 40 and 60%. The 50% level is marked as the center of this range.

- When the level is within the target range, increase or decrease the **RTA mic input level adjust** slider until the reading is as close to the 50% mark as possible. This is equal to the center channel output level at 85 DBFS (slow) and represents the overall reference level of 0 on the CP950 RTA display graph.

 **Note:** If your microphone has electronics that require +48V, to see activity on the CP950 RTA, you may need to click **on** for **RTA mic phantom power**.

- Figure 121: CP950 RTA microphone level adjustment



Move slider to 50% for target range - - - - - 

- The CP950 RTA should display results, as shown in the following figure. Be sure that you are measuring 85 DBFS (Slow) on your SPL meter.

Figure 122: Real-time analyzer display graph



 **Note:** On multiway speakers, you can adjust analog amplifiers to match the highs, mids, or lows to the x-curve as closely as possible.

- The **RTA mic input level** should show some activity. If the activity is low or does not appear, adjust the **MIC GAIN** on the CP950 rear panel to a level that is within the target range. The CP950 ships with a potentiometer trimmer, as shown in the following figure.

Figure 123: Potentiometer trimmer



- The web client UI also includes a digital trim that allows you to make fine adjustments.
 - The system automatically saves the **RTA mic input level adjust** value in its last position and performs calibration at that level. You can now proceed with the EQ. You need to obtain the final levels after EQ is complete.
 - It is now time to perform EQ for each individual speaker (or group of speakers on a single output). Refer to the RTA and adjust the 1/3 octave graphic EQ to bring the measured frequencies close to the x-curve line. Use industry best practices to make calibration decisions.
- Note:** For some multiway speakers, it may be better to adjust the amplifier gains. In some cases, a speaker may not be capable of producing very low or very high frequencies. For improved low frequencies on surround speakers, you can apply bass management. If the correct level on high frequencies is not reachable, you could add too much boost and wear out the drivers.
- After calibrating the individual speakers, you may need to calibrate speakers in an array. If you have only one speaker feed per wall, this is not needed (as shown previously for the output levels) and you can skip the next step.

4.2.4 Fine tuning with the Grossman eq

You can use the Grossman eq to fine tune room settings.

About this task

Grossman eq is an equalization 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 narrow band EQ. This tool displays an interface that provides users with the ability to utilize the one-twelfth octave capabilities of the Dolby CP950, Dolby CP850, and Dolby 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.

Procedure

1. 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 124: Grossman eq button



2. 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 125: 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 the Grossman equalizer 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

You can use the **flatten** button to set all visible bands to 0 dB gain.

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

You can view the results of the Grossman EQ.

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.

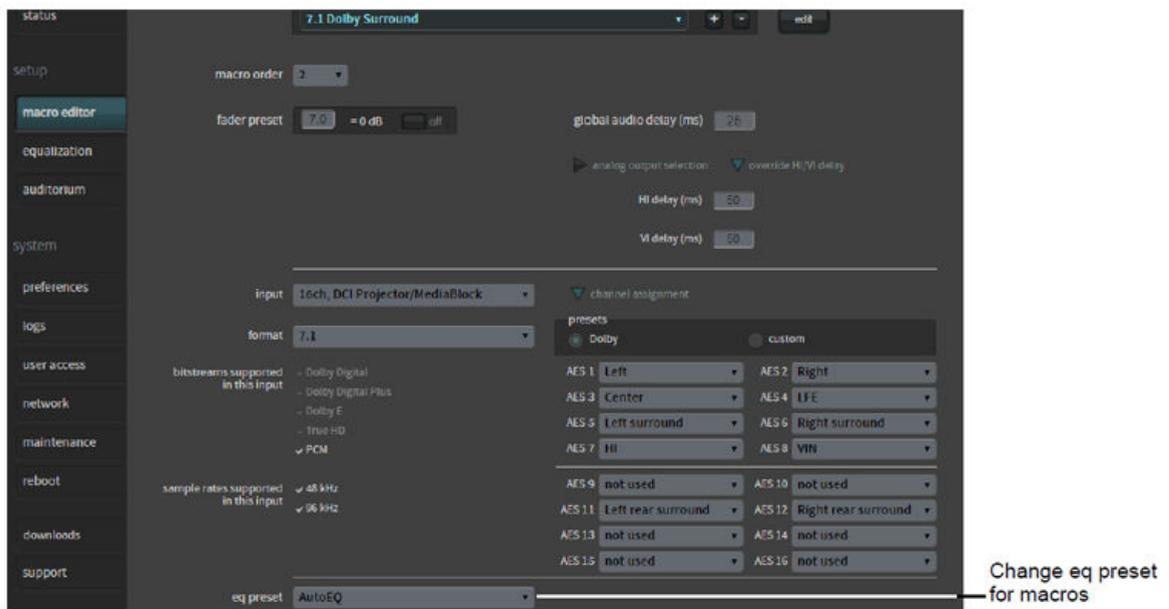
4.2.5 Configuring the macro editor

When your new EQ preset is finalized and completed, you can configure the macro editor.

Procedure

1. After equalizing the auditorium, click **macro editor** in the navigation bar.
2. Change the EQ preset for all of your current macros to the new preset you created.

Figure 126: Enter New EQ Preset for All Macros



4.2.6 Finalizing the equalization

You can finalize the equalization.

Procedure

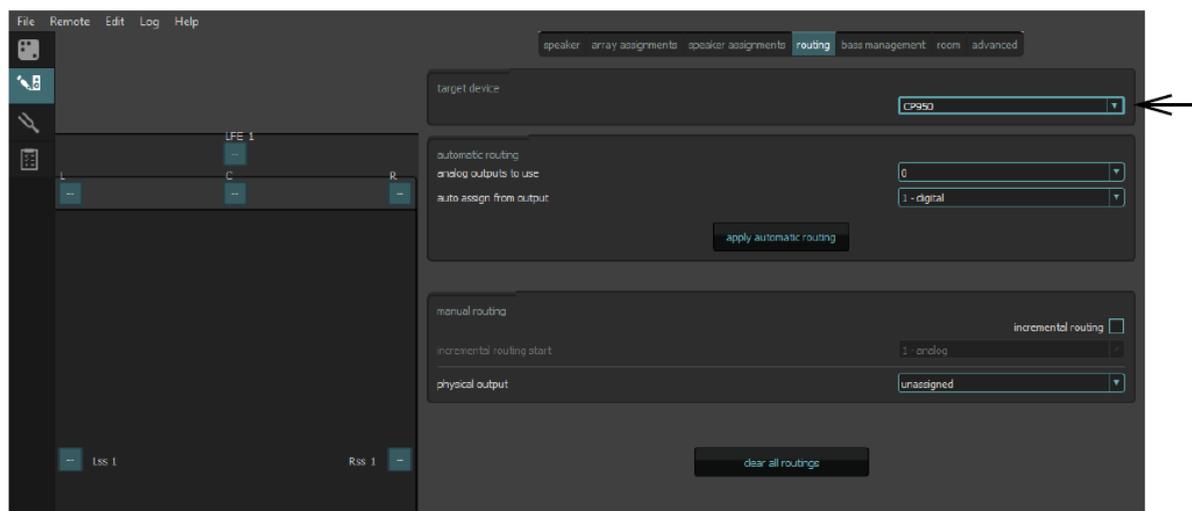
1. Test the Dolby CP950 audio playback to ensure proper operation and sound.
2. Click **maintenance** in the navigation bar and back up your system settings.
3. Save the backup in a safe place for future use.

4.3 Configuring a room using Dolby Atmos Designer and AutoEQ

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

You can connect to the Dolby CP950 in DAD version 3.2.10 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**, as shown in the following figure.

Figure 127: Select Dolby CP950 as Target Device in Dolby Atmos Designer



You can download the current version of DAD software by clicking **downloads** in the Dolby 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.

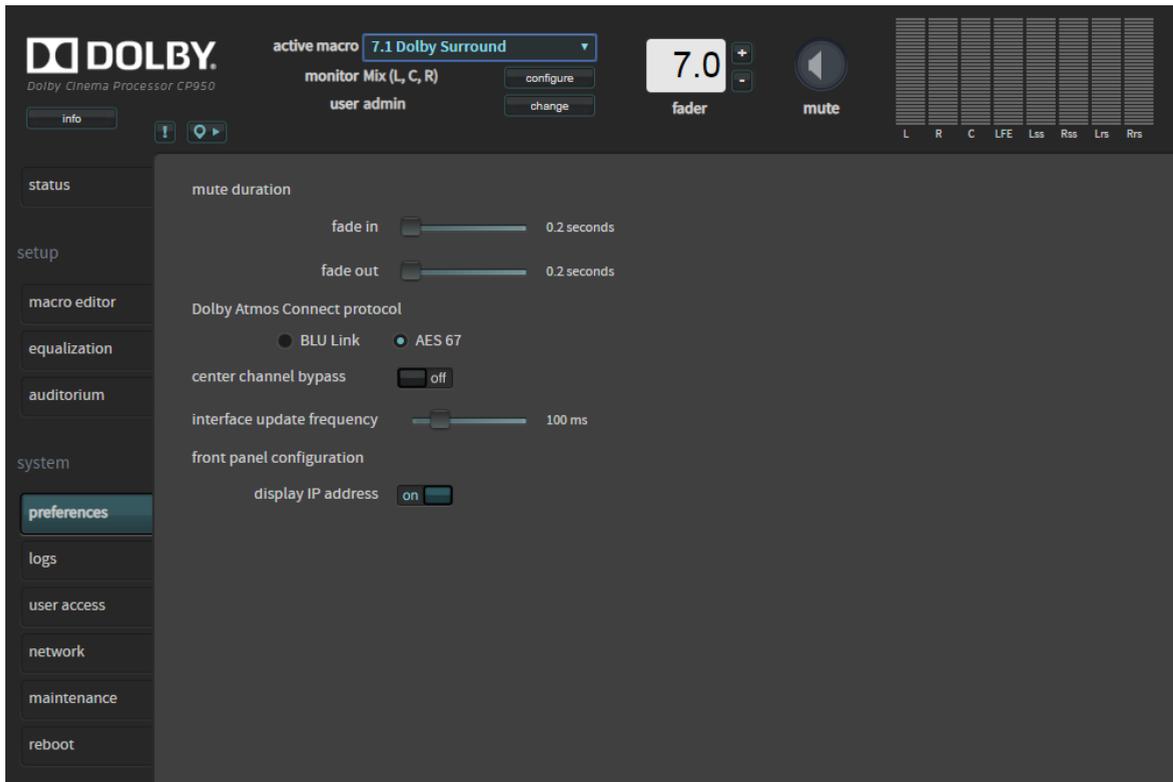
4.3.1 Configuring a digital output

You can configure a digital output.

Procedure

1. 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.
2. If you need BLU Link, select **Preferences** in the navigation bar at the left side of the screen, as shown in the following figure, and then switch from **AES67** to **BLU Link**.

Figure 128: 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.

Related information

[Modifying the network settings](#) on page 63

4.3.2 Creating a room in Dolby Atmos Designer and running AutoEQ

You can create a room in Dolby Atmos Designer and run AutoEQ.

About this task

To create a room and run AutoEQ in DAD, 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 Dolby CP950. In DAD, it is not possible to mix different routing types (analog and digital) for multiway speakers. After you create a room and run AutoEQ, save a copy of the DAD *.dac* file, and then:

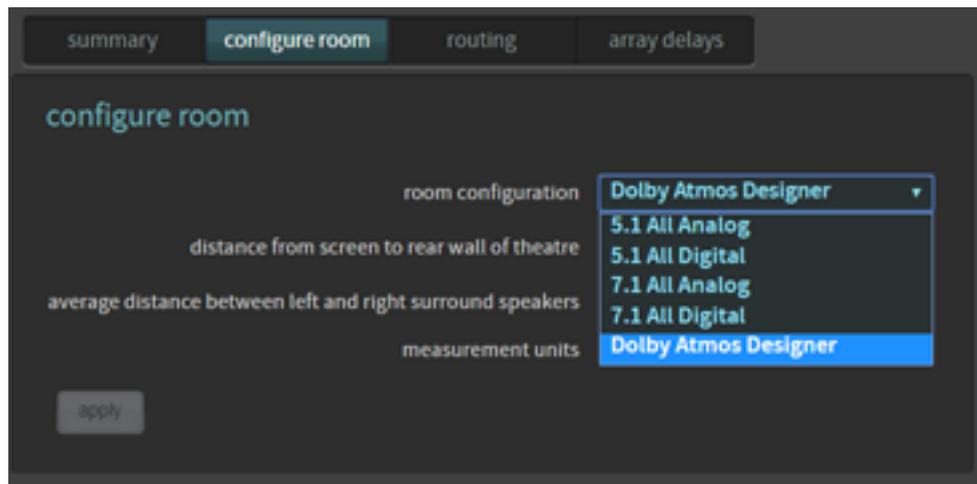
Procedure

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

Dolby Atmos Designer should be the selected for the **room configuration**, as shown in the following figure. 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 129: Dolby Atmos Designer Selected for Room Configuration



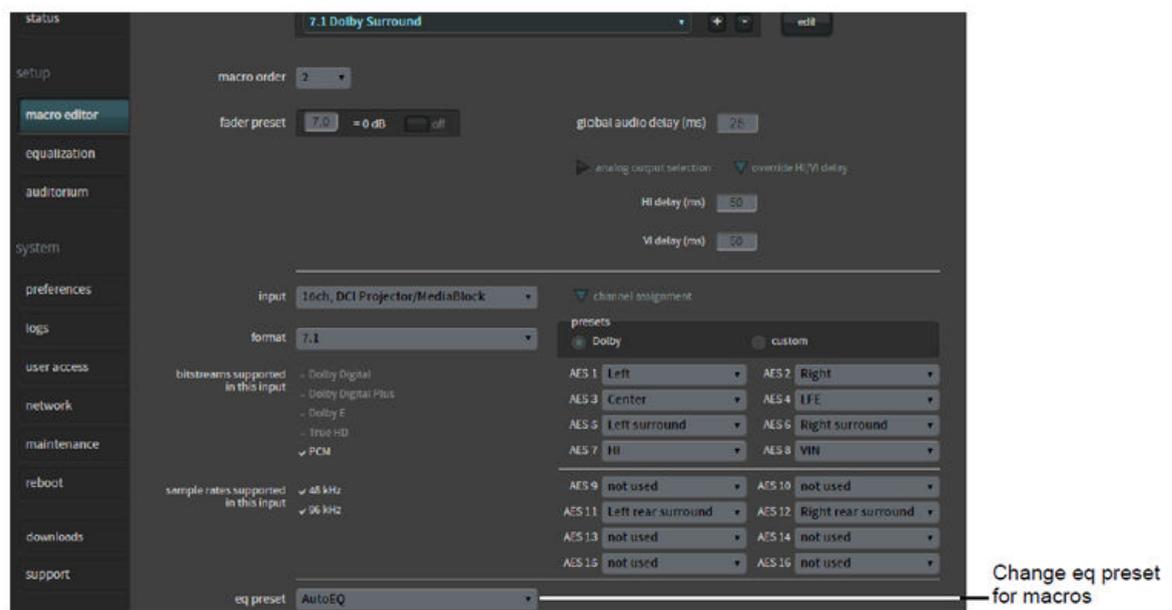
4.3.3 Configuring the macro editor

You can configure the macro editor.

Procedure

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

Figure 130: Enter New EQ Preset for All Macros



4.3.4 Finalizing the equalization

You can finalize the equalization.

Procedure

1. Test the Dolby CP950 audio playback to ensure proper operation and sound.

2. Click **maintenance** in the navigation bar, back up your system settings, and then save the backup in a safe place for future use.

Servicing the Dolby CP950

The Dolby 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 Dolby 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 Dolby CP950 mains power connection before troubleshooting or replacing parts. Place the Dolby CP950 on a stable and clutter free service. Do not place the Dolby CP950 in any area where it may become wet. Avoid servicing the Dolby CP950 during dust, humidity, and temperature extremes. Follow static electricity discharge protocols (use an antistatic strap).

- [Reseating or replacing the CAT1700 main board](#)
- [Replacing the CAT1740 power supply](#)
- [Troubleshooting and replacing fans](#)
- [Replacing the CAT1720 front-panel assembly board](#)

5.1 Reseating or 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 (part number CAT1700), if necessary.

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

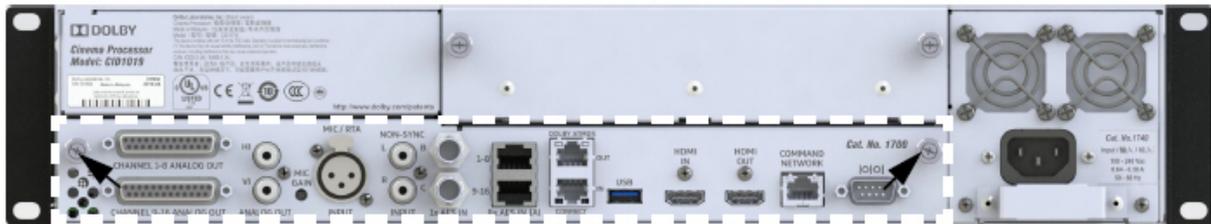
5.1.1 Reseating or replacing the CAT1700 main board

You can reseat or replace the CAT1700 main board.

Procedure

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 131: CAT1700 and Thumb Screws



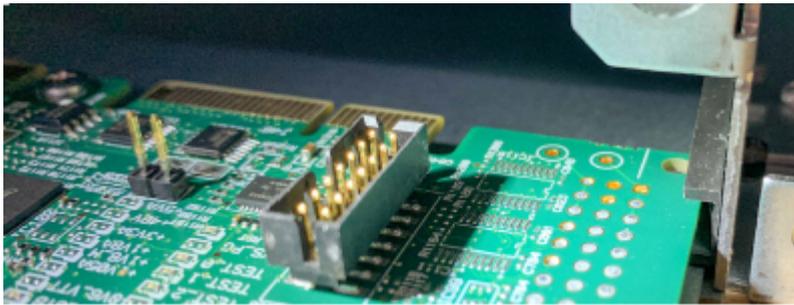
3. Unscrew the thumbscrews in a counterclockwise direction. These screws are captured in the chassis and do not come out completely.
4. When the thumbscrews are no longer securing the CAT1700 to the chassis, carefully pull on the thumbscrews to remove the board.

Figure 132: CAT1700 Removed



5. Inspect the CAT1700 main board for signs of damage to its components or the edge connector that plugs into the CAT1720 front-panel board. If there is damage, you may need to replace the CAT1700 or CAT1720.
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, as shown in the following figure.

Figure 133: 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 Dolby CP950 chassis, and then reconnect all cables.
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 reset the CAT1740, and how to replace it (part number CAT1740), if required.

- ! **Warning:** Double pole, neutral fusing. Disconnect the Dolby 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 Required tool

A small Phillips screwdriver is required to remove and replace the CAT1740 power supply module.

5.2.2 Troubleshooting, reseating, or replacing the CAT1740 power supply

You can troubleshoot, reset, or replace the CAT1740 power supply.

Procedure

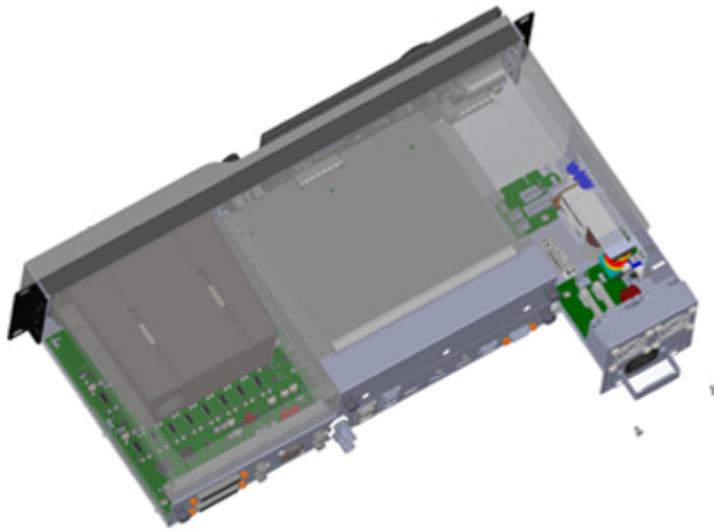
1. Power down the unit by disconnecting the power cord, and then (only if needed), disconnect all other connections.
2. Locate the CAT1740 power supply module on the rear panel.
3. Find the two screws that secure the power supply to the chassis, which are located on the left and right sides of the handle, as shown in the following figure.

Figure 134: 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, as shown in the following figure.

Figure 135: Remove Power Supply



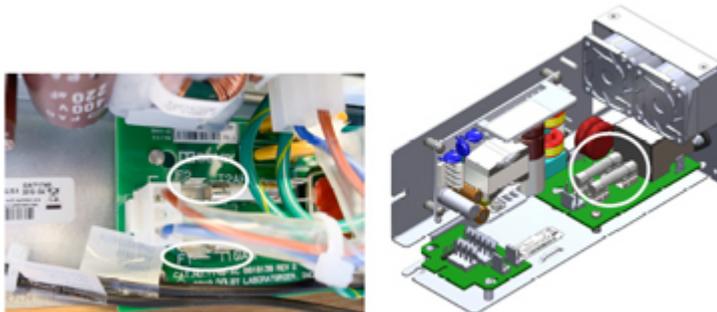
You can see several components in the CAT1740 power supply, as shown in the following figure.

Figure 136: Power Supply Components



The power moves through the AC input into two fuses on the power supply. Fuse 1 (F1), a 10-amp fuse, is closest to the exposed side of the power supply. Fuse 2 (F2), a 2-amp fuse, is located behind fuse 1. For your convenience, each fuse receptacle supports two fuse sizes, which makes it easier to purchase replacement fuses locally.

Figure 137: Power Supply Two Fuses



6. Use a multimeter (with the fuses installed) to determine if 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 the following specifications to locate a suitable replacement locally:
 - Fuse 1 (labeled **F1**) on the printed circuit board
 - Rating: 10 A 250 VAC
 - Type: Ceramic time lag
 - Small size: 5 × 20 mm
 - Large size: 6.3 × 32 mm
 - Fuse 2 (labeled **F2**) on the printed circuit board
 - Rating: 2 A 250 VAC
 - Type: Ceramic time lag
 - Small size: 5 × 20 mm
 - Large size: 6.3 × 32 mm
7. If both fuses are good, look for disconnected cables or damaged components. In some cases, it is good to remove and replace cables. After this inspection, reseat the power supply in the Dolby CP950, secure it with the two screws you removed, and try to power up the system.

If the Dolby CP950 still does not boot up, the problem is most likely related to a power supply component. If you have more than one Dolby 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.
8. The procedure is now complete.

5.3 Troubleshooting and replacing fans

You can troubleshoot and replace the fans in the Dolby CP950 power supply.

If the Dolby 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 Required tools

These tools are required for this procedure.

- Small Phillips screwdriver
- Small zip tie

5.3.2 Troubleshooting and replacing fans

To troubleshoot and replace fans in a CAT1740 power supply:

Procedure

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 Dolby 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 if needed, 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 on the rear panel, as shown in the following figure.
4. Find the two screws that secure the power supply to the chassis, as shown in the following figure.

Figure 138: Rear panel

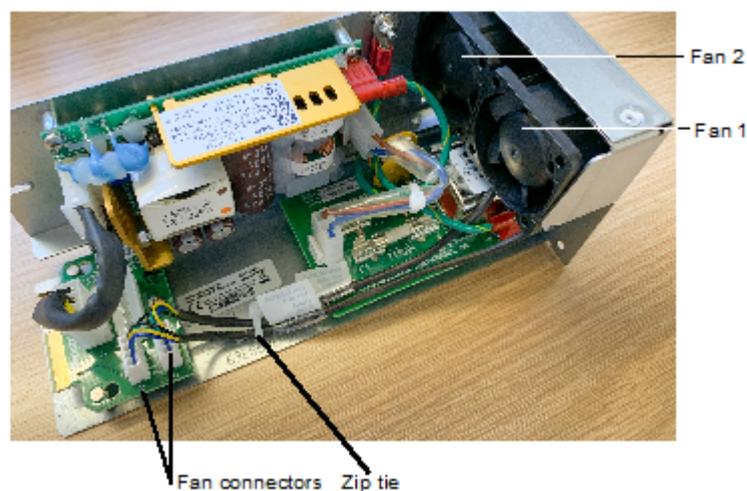


5. Use a small Phillips screwdriver to remove the two screws that secure the power supply to the chassis.
6. Use the handle on the power supply to pull the power supply out of the chassis.
7. Check the fan connection for the fan wires.

The wires for the fans are plugged into a small circuit board labeled CAT1740-DC. Fan 1 (on the left when viewed from the back of the Power Supply Module) connects to the J2 connector. Fan 2 (on the right) connects to the J3 connector.

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.

Figure 139: Fans and connectors



8. Reinstall the power supply in the Dolby 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.
The steps that follow show how to replace fan 1. The steps for replacing fan 2 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 140: Remove screws from fans



11. Locate and cut the zip tie around the fan cables (see zip tie in the figure on the previous page).
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

A small Phillips screwdriver is required to remove and replace the CAT1740 power supply module.

5.4.2 Troubleshooting and replacing the CAT1720

You can troubleshoot and replace the CAT1720 front-panel assembly.

Procedure

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 Dolby CP950.

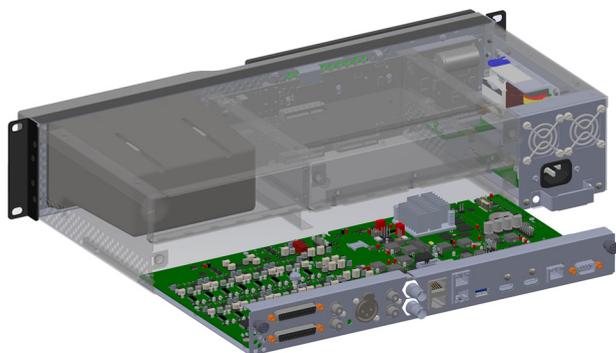
Figure 141: CAT1700 and Thumbscrews



3. Unscrew the thumbscrews in a counter-clockwise 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 142: CAT1700 Removed



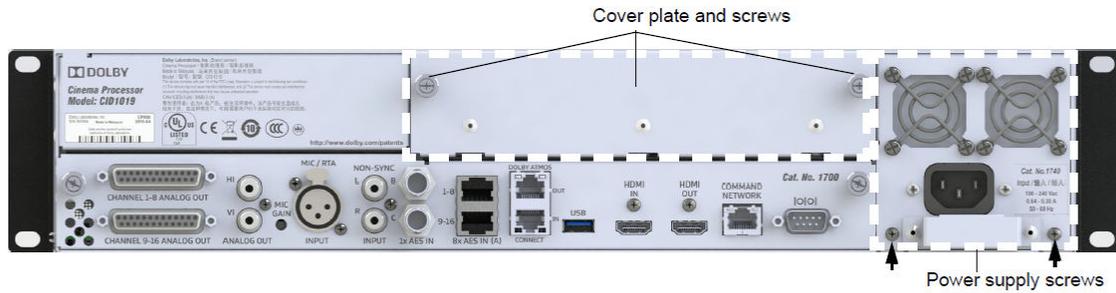
5. Inspect the CAT1700 main board for signs of damage to its components or the edge connector that plugs into the CAT1720 front panel. If there is damage, you may need to replace the CAT1700 or CAT1720.
6. To reseat or replace the existing CAT1700, align the circuit board with the guide rails on both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

Figure 143: 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 Dolby 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, as shown in the following figure.
 - ⚠ **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 144: 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. Locate the expansion board cover plate and screws, and then use the thumb screws 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, as shown in the following figure. Do not remove the two middle screws.

Figure 145: 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 146: 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, as shown in the following figure.

Figure 147: 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, as shown in the following figure.

Figure 148: 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 Dolby CP950 connectors

The pinouts provide useful information to help you connect the Dolby CP950 to external devices.

- [Dolby CP950 HDMI input and output pinouts](#)
- [Dolby CP950 16-Channel analog outputs](#)
- [Dolby CP950 serial port pinouts](#)
- [Dolby CP950 RJ45 AES3 pinouts](#)

6.1 Dolby CP950 HDMI input and output pinouts

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

Table 4: Dolby CP950 HDMI input and output pinouts

Pin	Description
1	Transition-minimalized differential signaling (TMDS) data 2 +
2	TMDS data 2 shield
3	Transition-minimized differential signaling (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 Display Data Channel (DDC) (SCL)
16	Serial DataLine for DDC (SDA)
17	DDC/Consumer Electronics Control (CEC) ground
18	+5 V power
19	Hot plug detect

6.2 Dolby CP950 16-Channel analog outputs

The Dolby 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 Dolby CP950 pinouts for analog output channels 1–8:

Table 5: Analog output 1 channels 1-8 pinouts

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 Dolby CP950 pinouts for analog output channels 9-16:

Table 6: Analog output 2 channels 9-16 pinouts

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

6.3 Dolby CP950 serial port pinouts

The Dolby 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.

Table 7: Dolby CP950 serial port pinouts

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)

6.4 Dolby CP950 RJ45 AES3 pinouts

The Dolby CP950 has two RJ45 AES3 ports, channels 1-8 on one connector and channels 9-16 on the other connector, as shown in the following tables.

Table 8: Dolby CP950 RJ45 AES3 Channels 1-8 pinouts

1	Channels 1 and 2 +
2	Channels 1 and 2 -
3	Channels 3 and 4 +
4	Channels 5 and 6 +
5	Channels 5 and 6 -
6	Channels 3 and 4 -
7	Channels 7 and 8 +
8	Channels 7 and 8 -

Table 9: Dolby CP950 RJ45 AES3 Channels 9-16 pinouts

1	Channels 9 and 10 +
2	Channels 9 and 10 -
3	Channels 11 and 12 +
4	Channels 13 and 14 +
5	Channels 13 and 14 -
6	Channels 11 and 12 -
7	Channels 15 and 16 +
8	Channels 15 and 16 -

Pinouts for Dolby servers with DB25 audio output

This chapter provides information for Dolby servers that use DB25 audio output.

- [Dolby DSS200 with CAT862 MB 8 x AES output pinouts](#)
- [Dolby DCP-2000 and Dolby DCP-2K4 Dolphin MB 8 × AES output pinouts](#)

7.1 Dolby DSS200 with CAT862 MB 8 x AES output pinouts

This table provides the Dolby DSS200 (with CAT862) 8 x AES output pinouts and descriptions.

Table 10: DSS200 8 x 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 +

7.2 Dolby DCP-2000 and Dolby DCP-2K4 Dolphin MB 8 x AES output pinouts

The following table provides the Dolby DCP-2000 and Dolby DCP-2K4 MB 8 x AES output pinouts and descriptions:

Table 11: Dolby DCP-2000 and Dolby DCP-2K4 Dolphin MB 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

8

Wiring the DB25/RJ45 adapter

This chapter 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 MB), and the Dolby DCP-2000 and Dolby DCP-2K4 (equipped with a Dolphin MB).

 **Note:** Dolby DSS playback systems provide two MB 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.

- [Required parts](#)
- [Using the correct pinouts for the DB25-to-Dual-RJ45 adapter](#)

8.1 Required parts

Use these parts to wire the DB25-to-dual-RJ45 adapter.

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

Figure 149: Adapter and Gender Changer



- 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.

8.2 Using the correct pinouts for 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 Dolby CP950.

To wire the adapter for your playback system, you need to connect its colored wires to the correct numbered pin holes, as specified in the following tables. The pinouts for the Dolby DSS200 CAT862 are different than those for the Dolby DCP-2000 and Dolby DCP-2K4, so the adapter wiring pinouts are also different. Be sure to use the correct table for your unit. Insert the specified wire into its corresponding pin hole until you feel the pin latch.

Table 12: Dolby 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 -

Table 13: Dolby 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 -

Table 14: Dolby DCP-2000 and Dolby DCP-2K4 Port-A Adapter Pinouts for Channels 1-8

RJ45 port-B 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 -

Table 15: Dolby DCP-2000 and Dolby DCP-2K4 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 -

Related information

[Installing the Dolby CP950 in a Dolby Digital Cinema network](#) on page 22

Required cabling changes when replacing a Dolby CP750

You need to make cabling changes when replacing a Dolby CP750 with a Dolby CP950.

- [Cabling changes required when replacing a Dolby CP750](#)
- [Pinout information for replacing a CP950 with a CP750](#)

9.1 Cabling changes required when replacing a Dolby CP750

You must change the cabling when replacing a Dolby CP750 with a Dolby CP950.

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

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

9.2 Pinout information for replacing a CP950 with a CP750

This section provides pinout information for the changes you must make when replacing a Dolby CP750 with a Dolby CP950.

There are three wiring change options:

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

The required wiring pinouts are shown in the following table:

Table 16: Dolby CP750 to Dolby CP950 wiring pinouts

Dolby CP750 cable pin number (must be male)	Dolby CP950 cable pin number (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
19	1	BsR+
20	23	R-
21	22	Ground
22	25	Ground
23	18	Ls+
24	4	Rs+
25	7	SW+

10

Remote control, monitoring, and automation

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

- [Web services API](#)
- [ASCII serial commands](#)
- [Simple network management protocol](#)

10.1 Web services API

The Dolby CP950 contains a rich web services API. You can use this API to control the CP950 or obtain information or status.

The use of web services requires the following files that contain the configuration, which you can access in a .zip file (*Dolby_CP950_WSDL_FILES.zip*) by clicking **downloads** in the Dolby CP950 web client navigation bar or via the Dolby customer portal at www.dolbycustomer.com.

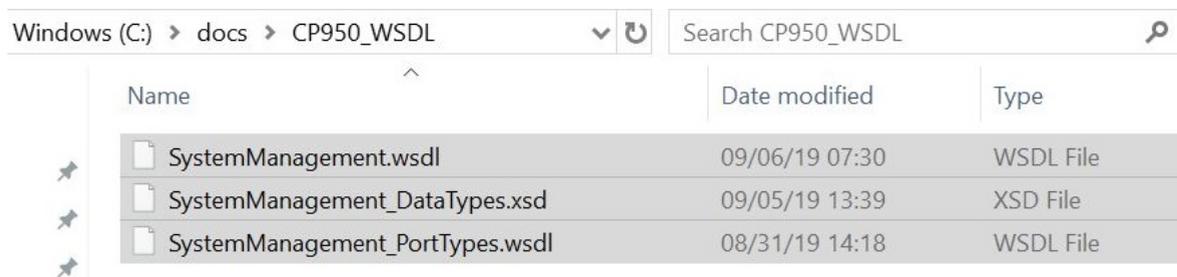
- *SystemManagement.wsdl*: Core functions of web services; References the other files
- *SystemManagement_PortTypes.wsdl*: Contains instructions for using the different commands; Use a text editor to view.
- *System_Management_DataTypes.xsd*: Schema definition file

The web services contained in the .zip file is a new version 2.0 with added functionality. The CP950 continues to support version 1.1 (initially released with the CP950), which is backward compatible with the CP850. For the best results, we recommend using version 2.0.

You can import the web services into your control system or use a program, such as SoapUI to inspect and test operations. Due to the different types of systems and interfaces, this section provides guidance to help you get started with web services.

1. Unzip the files to a single folder so that all three files are in the same directory, as shown in the following figure.

Figure 150: Unzip files into single folder



2. Once unzipped, you can modify the *SystemManagement.wsdl* file using a text editor (WordPad, Notepad++, and so on) to correctly set up the connection. Locate the **wsdl:import** statement near the top of the file, and the **location=** parameter, as shown in the following figure. This parameter tells the web services client where to find the *SystemManagement_PortTypes.wsdl* file. You will see that the instruction indicates that this information is at www.dolby.com. This is a placeholder and not a reference to www.dolby.com on the internet. You must make changes to correctly locate the file.

Figure 151: Unzip and set up location

```
<wsdl:definitions
  name="SystemManagement"
  targetNamespace="http://www.dolby.com/cp/ws/smi/systemmanagement/service"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns:tns="http://www.dolby.com/cp/ws/smi/systemmanagement/service"
  xmlns:dfs="http://www.dolby.com/cp/ws/smi/systemmanagement/definitions"
  xmlns:xmime="http://www.w3.org/2005/05/xmlmime"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <wsdl:import namespace="http://www.dolby.com/cp/ws/smi/systemmanagement/definitions"
    location="http://www.dolby.com:9090/cp/ws/smi/systemmanagement/schemas/SystemManagement_PortTypes.wsdl"/>
```

- If you are connected to the CP950 the network, replace www.dolby.com for **location=** with the CP950 IP address, as shown in the following figure. Be sure to save the configuration after making the change, and then proceed to step 3.

Figure 152: Setup for CP950 network

```

<wsdl:definitions
  name="SystemManagement"
  targetNamespace="http://www.dolby.com/cp/ws/smi/systemmanagement/service"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns:tns="http://www.dolby.com/cp/ws/smi/systemmanagement/service"
  xmlns:defs="http://www.dolby.com/cp/ws/smi/systemmanagement/definitions"
  xmlns:xmime="http://www.w3.org/2005/05/xmlmime"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <wsdl:import namespace="http://www.dolby.com/cp/ws/smi/systemmanagement/definitions"
    location="http://10.19.201.42:9090/cp/ws/smi/systemmanagement/schemas/SystemManagement_PortTypes.wsdl"/>

```

- If you are not connected to the CP950 network and want to explore web services using only the files on your computer (with SoapUI or similar software), replace the http request in **location=** with information that enables the *SystemManagement.wsdl* to locate the *SystemManagement_PortTypes.wsdl* file on your local system. Change "http://www.dolby.com:9090/cp/ws/smi/systemmanagement/schemas/SystemManagement_PortTypes.wsdl" to "./SystemManagement_PortTypes.wsdl", as shown in the example in the following figure.

Figure 153: Setup if not on CP950 network

```

<wsdl:definitions
  name="SystemManagement"
  targetNamespace="http://www.dolby.com/cp/ws/smi/systemmanagement/service"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns:tns="http://www.dolby.com/cp/ws/smi/systemmanagement/service"
  xmlns:defs="http://www.dolby.com/cp/ws/smi/systemmanagement/definitions"
  xmlns:xmime="http://www.w3.org/2005/05/xmlmime"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">

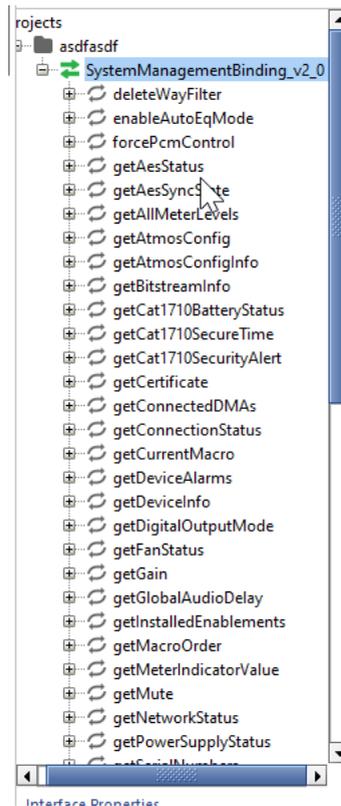
  <wsdl:import namespace="http://www.dolby.com/cp/ws/smi/systemmanagement/definitions"
    location="./SystemManagement_PortTypes.wsdl"/>

```

Be sure to save the configuration after making the change.

3. For both of the previous setups, you can load the *WSDL* files into your automation system, SoapUI, or a similar program. Each of the functions is shown in a list. See the list of loaded file functions in the following figure.

Figure 154: WSDL files loaded



Note: Each of the functions in the *WSDL* file includes the “www.dolby.com” address. This remains only a placeholder. For the commands to work correctly, be sure that “www.dolby.com” is replaced for your CP950 network setup or non-CP950 network setup (in **location=**), as described in the two previous setups.

10.2 ASCII serial commands

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

Table 17: ASCII serial commands

Parameter name	Description	Argument/value	Usage
sys.macros	Read list of macro names and numbers	?	" sys.macros ? "
sys.macro_preset	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 "

Table 17: ASCII serial commands (continued)

Parameter name	Description	Argument/value	Usage
sys.macro_name	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 "
sys.fader	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 a fader to 5.5)	Integer (1-100)	" sys.fader 55 "
ctrl.fader_delta	Increase current fader level (increases fader level by .1)	(Integer 1-100)	" ctrl.fader_delta 1 "
	Decrease current fader level (decreases fader level by .1)	(Integer 1-100)	" ctrl.fader_delta -1 "
	Increase current fader level (increases fader level by .5)	(Integer 1-100)	" ctrl.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 the IP address of the CP950	?	" sys.ip_settings ? "

10.3 Simple network management protocol

Simple Network Management Protocol (SNMP) allows you to monitor different Dolby CP950 operational functions. However, you cannot use SNMP to change settings or configurations. You can download a SNMP *.zip* file by clicking **downloads** in the web client navigation bar.

You can monitor these basic variables for the Dolby CP950:

- Dolby CP950 chassis serial number
- CAT1700 main board serial number
- Main software version
- Fans 1 and 2 status
- Temperature status (several sensors)
- Power supply status
- CAT1700 main board battery voltage

- Current input and format in the active macro
- Current EQ preset in the active macro
- Current global audio delay in the active macro
- Current fader level
- Mute status
- Current bitstream format (when using a coded digital input)
- Current AES sync state status
- Current 8x AES input status
- Hearing impaired (HI) and Visually-impaired narration (VI) delay values when using the 8x AES input
- Center channel bypass status (on/off)
- Meter levels for channels
- Any active system alerts (For more detailed information, connect to the CP950 web client UI)
- Network status
- Current NTP address, status, and hostname
- List of the connected Dolby Multichannel Amplifiers (Dolby Atmos Connect only, status not available for analog connections)
- Current site information (from information provided in the Dolby Atmos Designer software)
- System uptime

A comprehensive list of monitorable objects and their values is contained in the *DOLBY-CP950.mib*, which you can view with a text editor. Note that the file contains support for future functionality (Dolby Atmos and the CAT1710 Media Block). You can monitor these new objects, but they will not be usable data until the new expansion card is installed.