Setup Guide

DSP Bundle

Extron Certified DSP Bundle for Microsoft Teams Rooms - Medium Room

Microsoft Teams Rooms Certified Design Solution

Extron

68-3697-50 Rev. B
02 22

Safety Instructions

Safety Instructions • English

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ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

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Instrucciones de seguridad • Español

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Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, **www.extron.com**.

Istruzioni di sicurezza • Italiano

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안전 지침 • 한국어

경고: 이 기호 ⚠ 가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

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안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(**www.extron.com**)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

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FCC Class B Notice

NOTE: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee that interference will not occur. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment.

NOTE: For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics see the **Extron Safety and Regulatory Compliance Guide** on the Extron website.

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

DANGER:

- Will result in serious injury or death.
- Entraînera des blessures graves ou la mort.

ATTENTION:

- Risk of property damage.
- Risque de dommages matériels.

NOTE: A note draws attention to important information.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

Extron Glossary of Terms

A glossary of terms is available at **http://www.extron.com/technology/glossary.aspx**.

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Introduction

This section provides an overview of the Extron Certified DSP Bundle for Microsoft Teams Rooms - Medium Room. Topics include:

- **About this Guide**
- **Overview**
- **Requirements**
- **Application Diagrams**

About this Guide

This guide describes the integration of Extron's Certified DSP Bundle for Microsoft Teams Rooms - Medium Room system.

Overview

Microsoft and Extron have come together to provide Microsoft Teams Rooms solutions with our certified hardware. Now it's easier than ever to stay connected with flexibility of realtime collaboration from anywhere. The products in our Microsoft Teams Rooms Certified Design Solutions have been designed and meticulously tested for best in class performance and ease of use.

Requirements

Extron Equipment List		
Product	**Description**	**Quantity**
DMP 64 Plus C V AT	6×4 Digital Matrix Processor w/ AEC, VoIP, & Dante	1
XPA U 1002-70V	Two-Channel Amplifier, 100 watts at 70 volts	1
SF 3CT LP	3" Full-Range Ceiling Speakers, 70/100V, Pair	1
SPK16P	16 AWG Plenum Speaker Cable - 75' (22.8 m)	1
USB CFG Cable	USB A Male to USB Mini B Male 6' (1.8 m)	1
Audio Cable	Balanced audio cable for Audio DSP output to Amplifier Input - 6' (1.8 m)	1
Network Cable	Cat-6 Plenum network cable - 35' (10.7 m)	2
Network Cable	Cat-6 Non-Plenum network cable - 6' (1.8 m)	1

Sennheiser Equipment List		
Product	**Description**	**Quantity**
TeamConnect Ceiling 2	Beamforming Ceiling Microphone array	1
SL CM EB US	Ceiling Mic Extension Brackets, US	1

Additional Required Equipment		
Product	**Description**	**Quantity**
MTR Computer	Microsoft Teams Rooms Computer with Camera and Control interface	1
Network Switch	10-port PoE network switch	1
Windows computer or laptop	Computer must contain the following: • Extron DSP Configurator • Dante Controller • Sennheiser TCC2 Control Cockpit • Extron DSP Configuration *.zip files	1

NOTE: The Windows computer or laptop is required for adjustments and can be disconnected after system configuration.

Application Diagrams

The following illustrations are examples of configuring the DMP 64 Plus for use with Teams in a conference room.

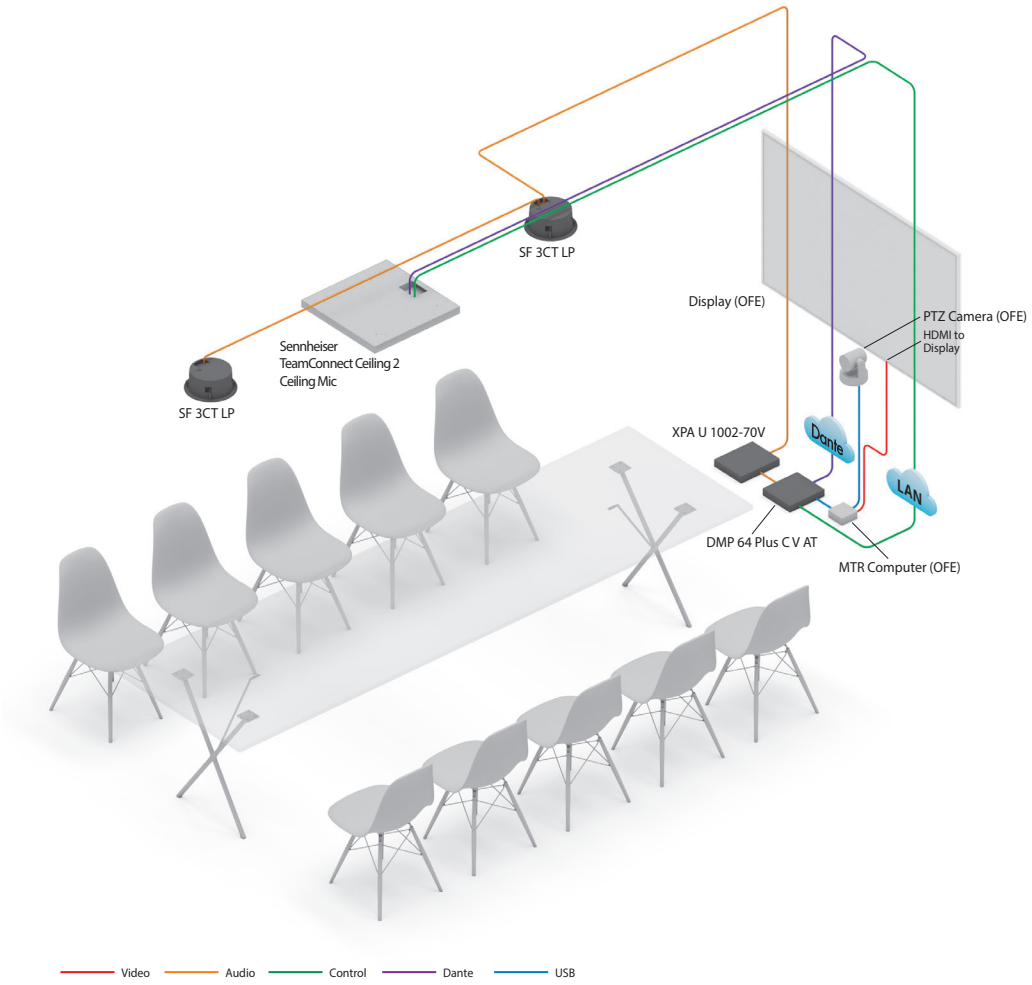


Figure 1. Conference Room Application Example

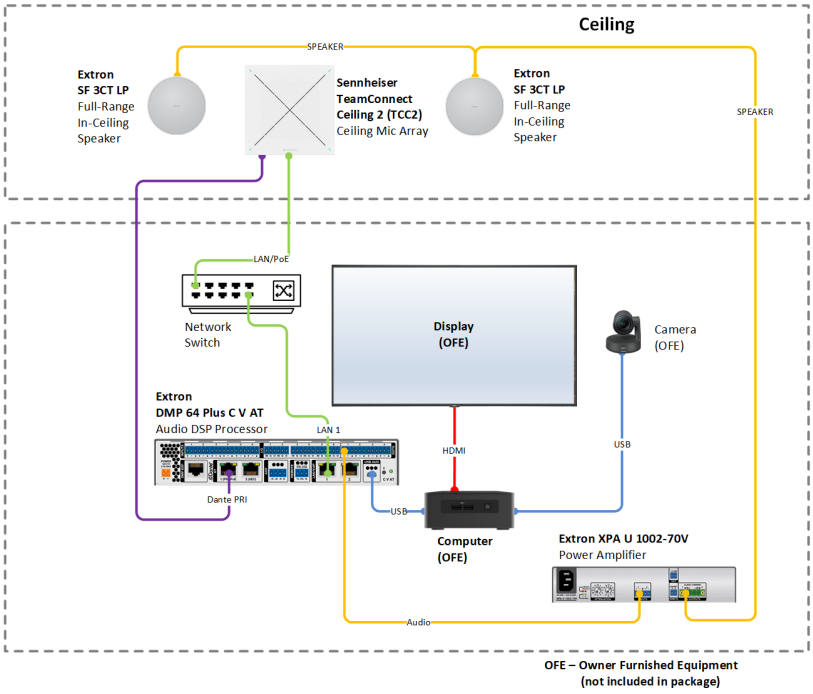


Figure 2. System Diagram Example

NOTE: The supplied network switch is manageable, however the default configuration is sufficient for this solution to function.

Installation Details

See figure 3 for the connections needed between the DMP Plus and the XPA U amplifier. Use the supplied balanced audio cable to connect each product.

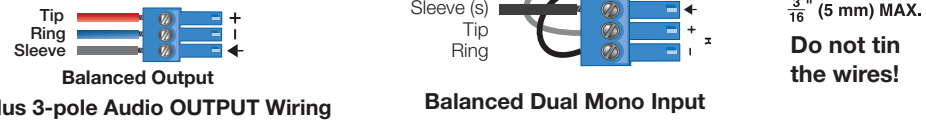
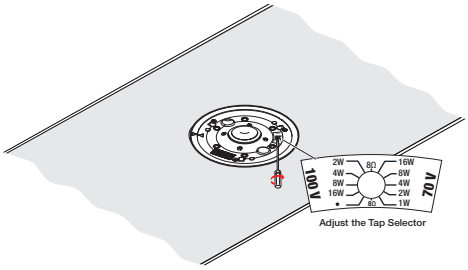


Figure 3. Captive Screw Audio Cable Wiring

Speaker Installation

During installation of the speaker(s), please ensure the rotary tap selector switch is set to 70V, 16W.

For detailed setup instructions please refer to the SF 3CT LP setup guide.



Configuring Extron Certified DSP Bundle for Microsoft Teams Rooms - Medium Room

This section provides information on the following topics:

- **Configuration Overview**
- **Sennheiser TeamConnect Ceiling 2 Setup**
- **Dante Controller Setup**
- **Extron DMP 64 Plus Setup**
- **Microsoft Teams Rooms Setup**

Configuration Overview

1. Unbox and connect the provided hardware using the above diagram (see **figure 2** on page 3).

NOTE: Do not connect the USB cable between the Microsoft Teams Rooms (MTR) computer and Extron DMP Plus. This will be connected after the Extron DMP Plus is properly configured.

2. Configure a computer with the following software utilities:
   - Extron DSP Configurator Software
   - Dante Controller Software
   - Sennheiser Control Cockpit Software
3. Download the following from the Extron website (**www.extron.com/microsoft**):
   - Extron Certified DSP Medium Room Bundle .zip folder

Sennheiser TeamConnect Ceiling 2 Setup

Sennheiser TeamConnect Ceiling 2

Sennheiser TeamConnect 2 (TCC2) audio output is connected to the Extron DMP Plus series via the Dante audio connection.

An additional PoE/Control connection is required to support LED feedback, microphone mute controls as well as powering the ceiling microphone. **Figure 4** on page 5 shows the browser-based Control Cockpit interface used to detect and identify the TCC2.

The browser-based Control Cockpit interface detects and identifies the TCC2 using mDNS when the network cable is attached to the TCC2 Ethernet PoE/Ctrl port.

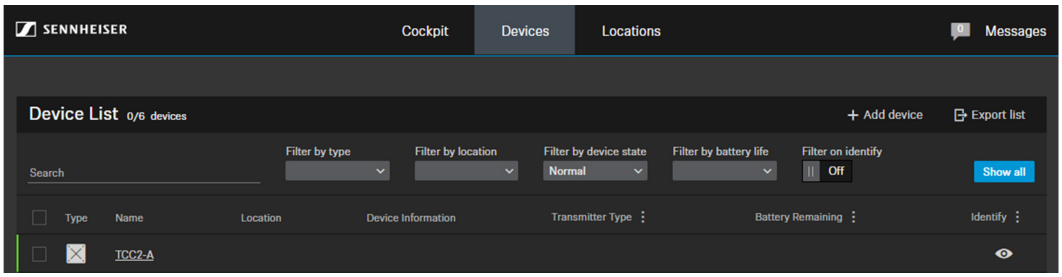


Figure 4. Control Cockpit Interface

From this interface, the following actions are performed:

- Setting Network Settings
- Beam-steering and Exclusion Zone adjustments

Setting Network Settings

Set and document IP/host name of the device. This will be required later.

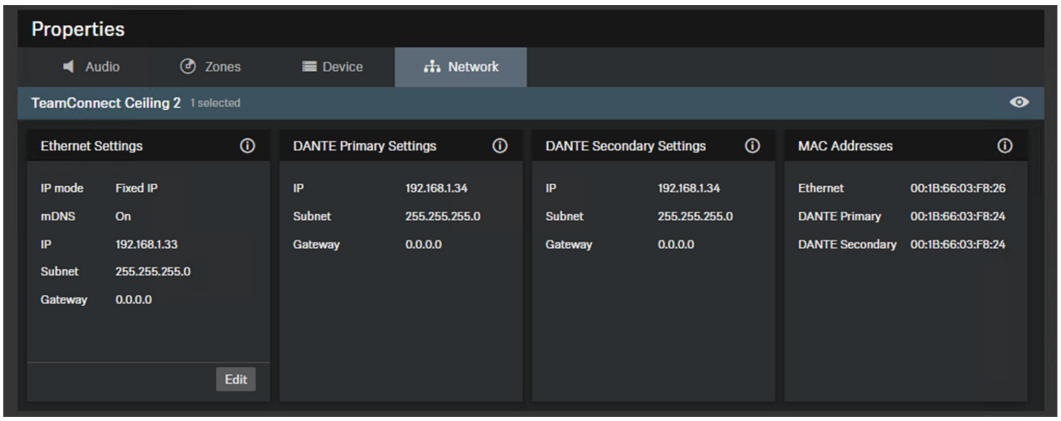


Figure 5. Control Cockpit Network Interface

Beam-steering and Exclusion Zone Adjustments (Optional)

If additional settings are required to reduce background of items such as HVAC, projector fans, credenzas, etc. the TCC2 has a Priority Zone and up to 5 Exclusions Zones which can be leveraged to remove these from the microphone pickup.

To configure a zone:

1. Select the desired unit from the `Device List`, a **`Properties`** dialog box is opened.
2. Under the `Zones` tab, the `3D Overall View` shows the real-time focus of the TCC2 automatic beam-steering (see **figure 6** on page 6). Users can manually enable a Priority or Exclusion Zone,
3. Edit the vertical and horizontal angles of the selected exclusion zones (see **figure 7** on page 6) to remove the observed noise.

NOTE: Refer to the *TeamConnect Ceiling 2* instruction manual for more information.

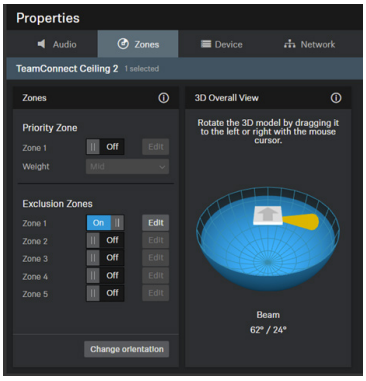


Figure 6. Control Cockpit Properties Window

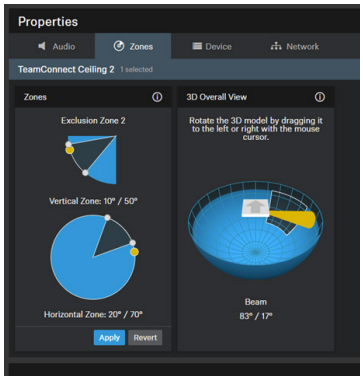


Figure 7. Control Cockpit Zones Tab

Dante Controller Setup

Dante Controller from Audinate is required to route transmitters and receivers, and can be used to configure Dante settings and monitor performance.

Creating Subscriptions Between Sennheiser TCC2 and Extron DMP 64 Plus

1. Ensure the Laptop, DMP 64 Plus C V AT (Dante), and TCC2 (Dante) are connected to the same network.
2. From the Windows `Start Menu` select: `All Programs > Audinate > Dante Controller`. The `Dante Controller - Network View` screen opens. Dante Controller auto-discovers Dante devices on the network and advertises itself to allow other Dante-enabled devices to communicate with it. Transmitters connect to receivers using the subscription matrix (see figure 8).

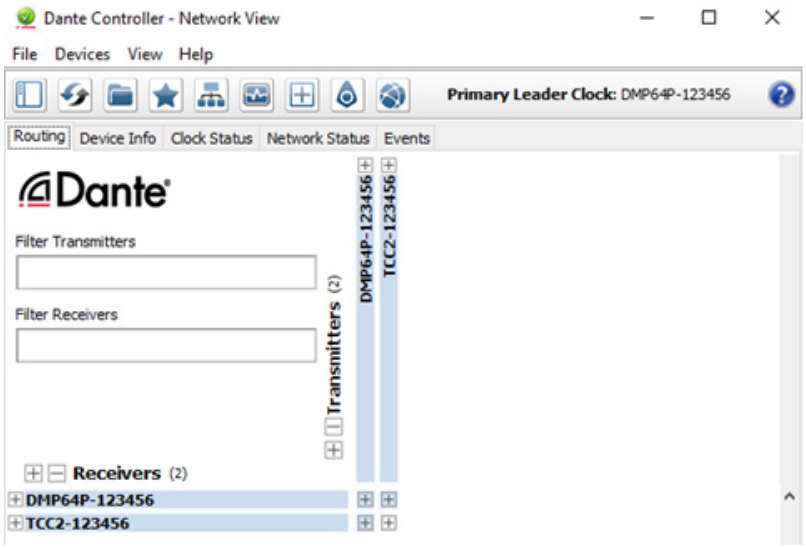


Figure 8. Routing Tab of Network View Screen

NOTE: The DMP 64 Plus and TCC2 Dante connections are set to DHCP by default. If they cannot be discovered, ensure the correct interface is selected on the PC by selecting `Interfaces` from the `File` menu.

3. Open the **Device View** of the DMP 64 Plus by double clicking it in the **Routing** tab.
4. In the **Receive** tab, rename the first receive channel to TCC2-A.

Figure 9. Receive Tab of Network View Screen

5. In the **Transmit** tab, rename the first transmit channel to TCC2 Ref.

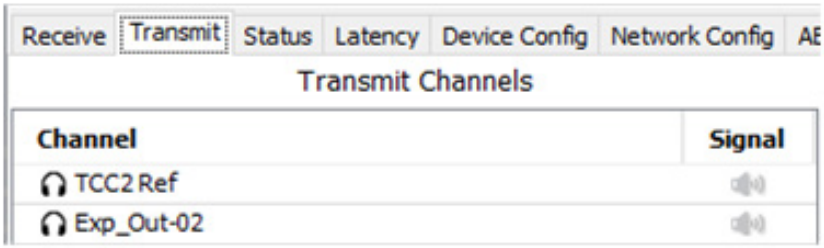


Figure 10. Transmit Tab of Network View Screen

6. In the **Device Config** tab, rename the DMP 64 Plus to the desired name and click **Apply.**

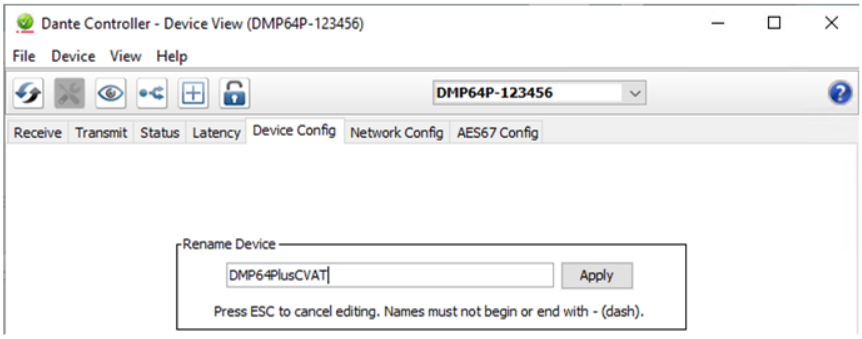


Figure 11. Device Config Tab of Network View Screen

7. From the **Device View** pulldown, choose the TCC2.
8. In the **Device Config** tab, rename the TCC2 to TCC2-A.

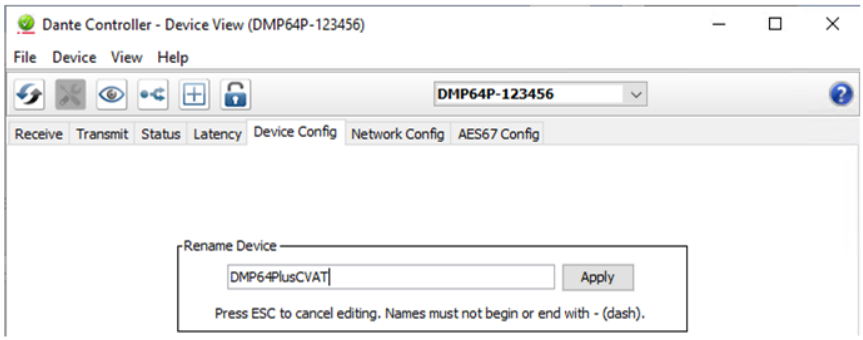


Figure 12. Renaming the Device

9. Close the `Device View` window and return to the `Network View` window.
10. To show the transmitters of a Dante device, click the **+** box next to the desired device in the `Dante Transmitters` panel, such as TCC2-A (see **figure 13** on page 9). The **+** changes to a **-** sign when the device expands.
11. To show the receivers of a Dante device, click the **+** box next to the desired device in the `Dante Receivers` panel, such as DMP64PlusCAT.
12. Click the intersections of the desired subscriptions between transmitter and receiver channels.

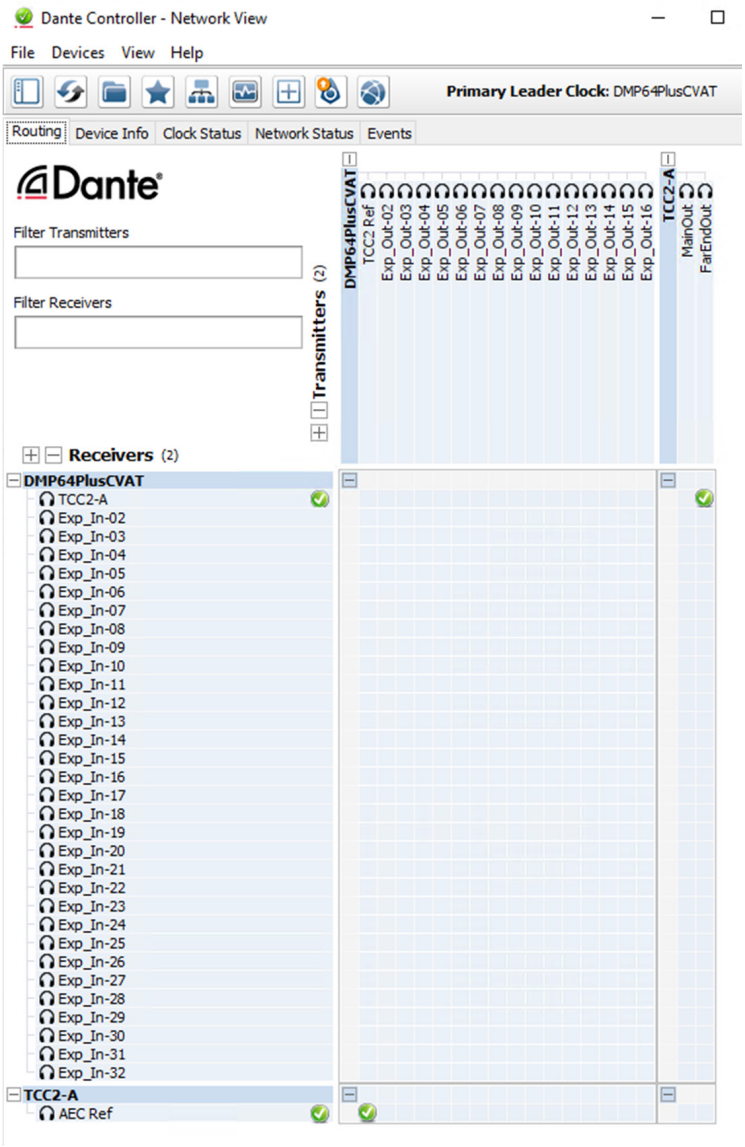


Figure 13. Network View Screen

NOTES:

- The FarEndOut transmitter channel of the TCC2 should be routed to the first receiver channel of the DMP 64 Plus. A check mark at the intersection indicates the subscription is made. A check mark also appears next to the receive channel.
- The TCC2 Ref transmitter channel of the DMP 64 Plus should be routed to the AEC Ref receiver channel of the TCC2.

Extron DMP 64 Plus Setup

To configure the Extron DMP 64 Plus, perform these steps:

1. Set IP address via embedded web page
2. Set the computer's or laptop's IP address within the range of the product's IP address. The default address (LAN for non-V-models, LAN 1 for V-models) is:
   - 192.168.254.254
   - Subnet 255.255.255.0
   - Gateway 0.0.0.0
3. From a web browser, enter the device IP address into the address field.

   NOTE: If the local system administrators have not changed the IP address, and the device has not been assigned an IP address via DHCP, the default address (LAN for non-V-models, LAN 1 for V-models) is 192.168.254.254.

4. Press **Enter**.
5. On the login page, enter "admin" as the **Username**, enter the **Password** (if one has been set), and click **Sign In**.
   - By default, the password is the product's serial number
   - If mode 5 reset has been performed, then the password will be clear and the **Password** field can be left blank.

Figure 14. Login Page

The Communications Settings Panel displays TCP/IP communication settings. Click **Edit** to open the **Communication Settings** dialog box and edit the TCP/IP settings.

The following can be edited: DHCP status, IP address, subnet mask, and default gateway. This dialog box also displays the device MAC address. To revert the computers IP address to a range which can communicate to the new IP address schema.

NOTE: If **Use DHCP** is enabled, IP address, subnet mask, and default gateway cannot be edited.

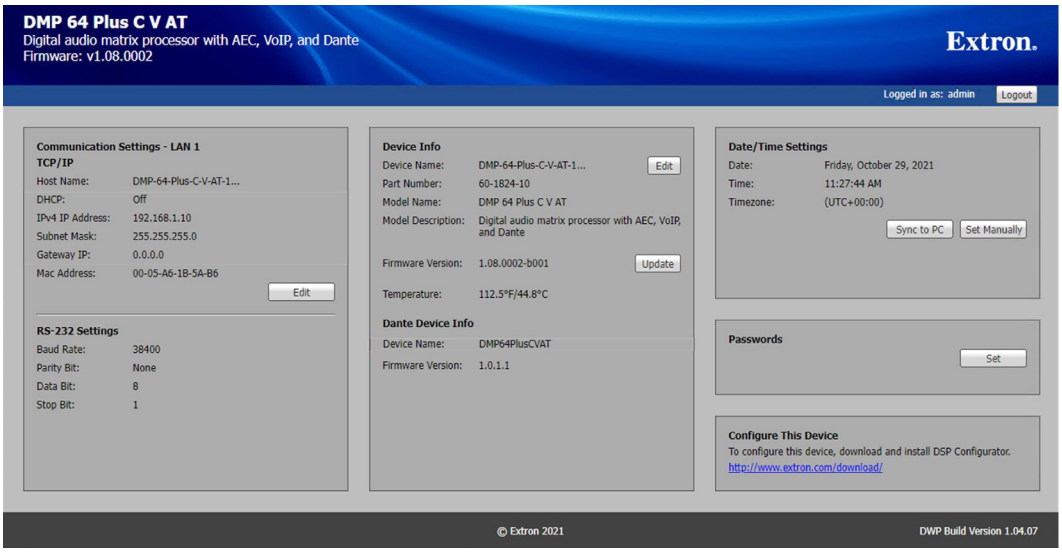


Figure 15. Communications Settings Panel

To push the DSP Template file to the DMP Plus:

1. Open the Extron DSP Template file (downloaded previously in .zip file) with DSP Configurator software.
2. Connect to a DMP 64 Plus in Live Mode by clicking the Live button in the menu bar of DSP Configurator (see figure 16, ❶). Alternatively, select **`Tools > Connect to Device`** or press `F6` on the keyboard. The `Connect to Device` dialog box opens.

Figure 16. Live Button

3. Click the `TCP/IP` tab in the dialog box.
4. Enter the IP address of the device in the **`Hostname`** or **`IP Address`** field. If necessary, enter the device password in the **`Password`** field.
5. When a connection type with a device is established, the `Synchronize with Device` dialog box opens. Select **`Push`**.

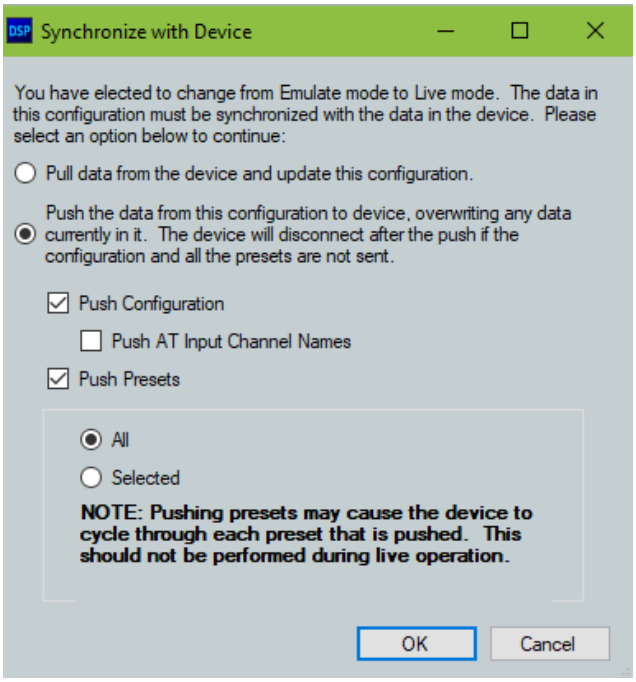


Figure 17. Synchronize with Device Dialog Screen

6. Click **OK**.

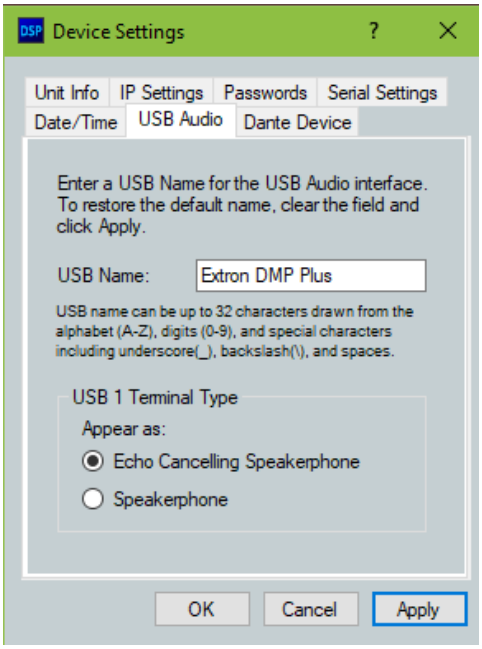
Once the push is completed, the current state of the connected DMP 64 Plus is displayed in the DSP Configurator status panel and the device is ready for further configuration.

USB Naming

The USB Audio tab allows for customizing USB audio interface names and terminal types. To configure USB Audio settings in DSP Configurator:

NOTE: Extron recommends configuring these settings before connecting USB audio devices to a PC.

1. From the Tools menu, select Device Settings. The Device Settings dialog box opens.
2. Click the USB Audio tab.
3. In the USB Name field, enter the desired name for the USB Audio interface.
4. In the USB Terminal Type panel, choose Echo Cancelling Speakerphone.
5. Click Apply to activate the new settings.
6. Connect the USB audio port to the PC.



Edit Macros

Macros are sets of actions that can affect the local DMP 64 Plus and other Extron products on the same TCP/IP network. Macros are required for the Mute Sync Status indicators on the Sennheiser microphone to function properly. They can be configured in Emulate or Live mode via an Ethernet connection only, and they can be saved to a configuration file or pushed to DMP 64 Plus internal memory. Macros are comprised of up to 32 actions that occur in sequence to quickly configure a system for specific applications.

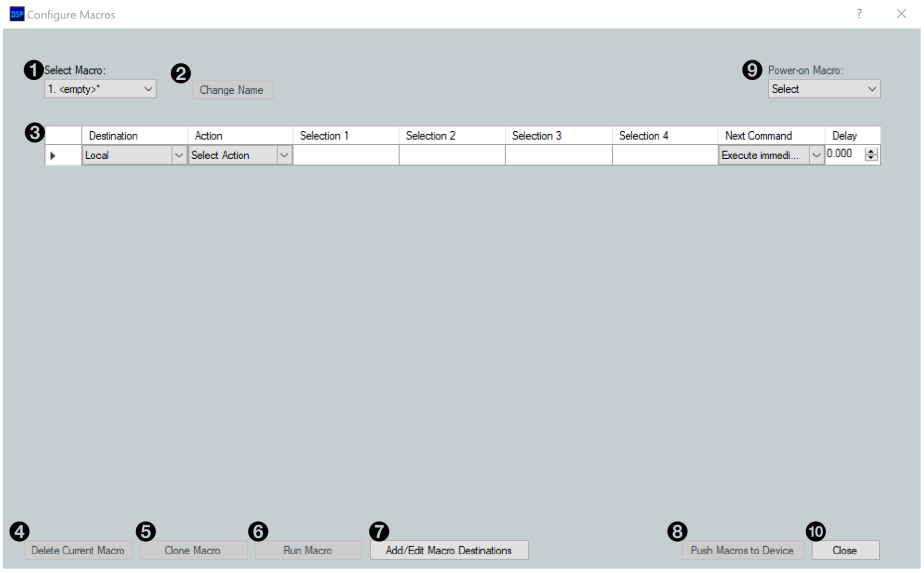


Figure 18. Configure Macros Screen

1. Select ❼ **Edit Remote Destinations**.
2. Select TCC2-A and update the IP address to match the microphone that was configured earlier
3. Select **Apply.**
4. Select ❽ **Push Macros to Device**.

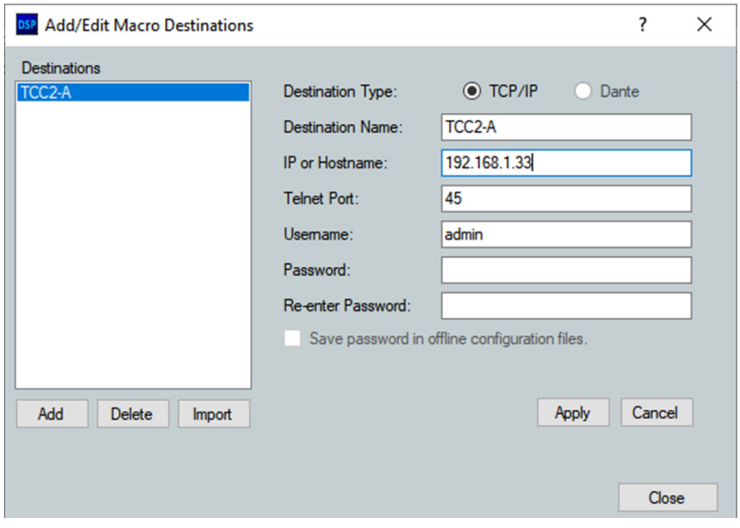


Figure 19. Add/Edit Macro Destinations Dialog Box

Microsoft Teams Rooms Setup

The Extron DMP 64 Plus connects to the Microsoft Teams Rooms system from the USB Audio port.

Once the previous steps outlined in this document have been complete, please connect the Microsoft Teams Rooms Rooms system to the DMP 64 Plus USB Audio connection via the provided USB mini-B cable.

The following steps detail the required settings on the Microsoft Teams Rooms Room device:

1. Select “More” in the Teams Rooms interface

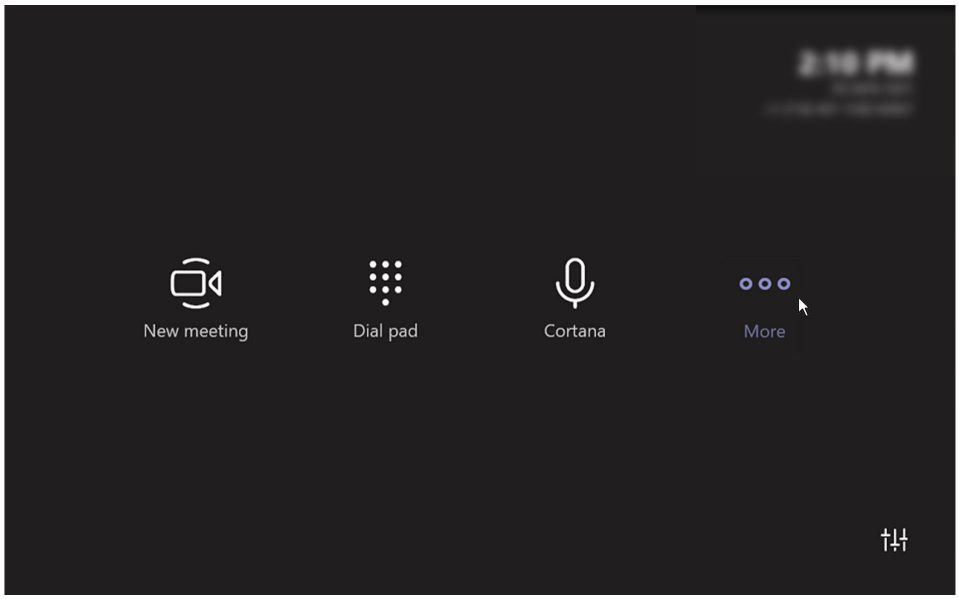


Figure 20. Microsoft Teams Rooms Room Interface Screen

2. Select “Settings”

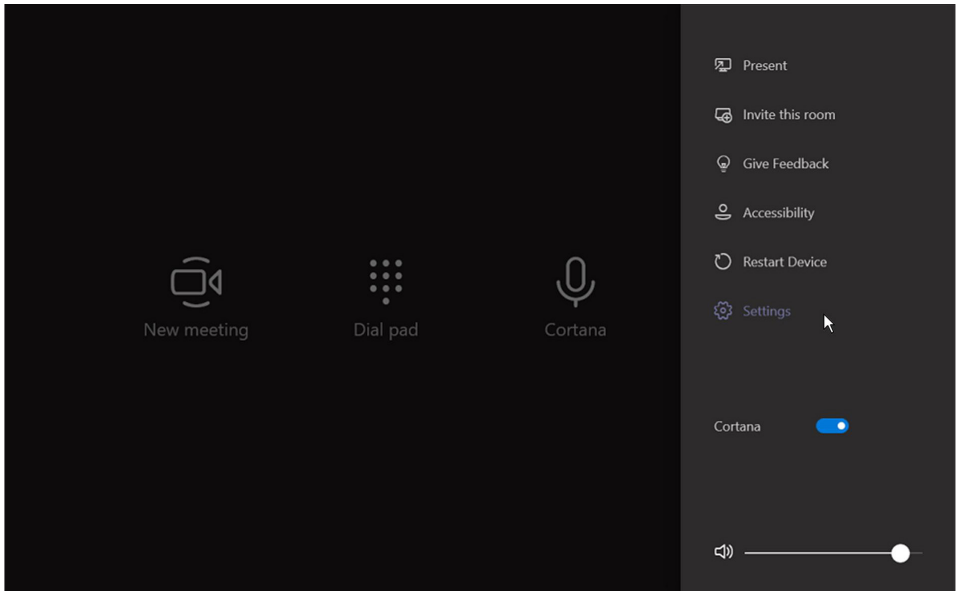


Figure 21. Microsoft Teams Rooms Settings

3. In the Settings menu, select Peripherals, and use the dropdown menus to select the Extron DMP Plus (or configured USB Name in above steps) for each of the three parameters: Microphone for Conferencing, Speaker for Conferencing, and Default Speaker.

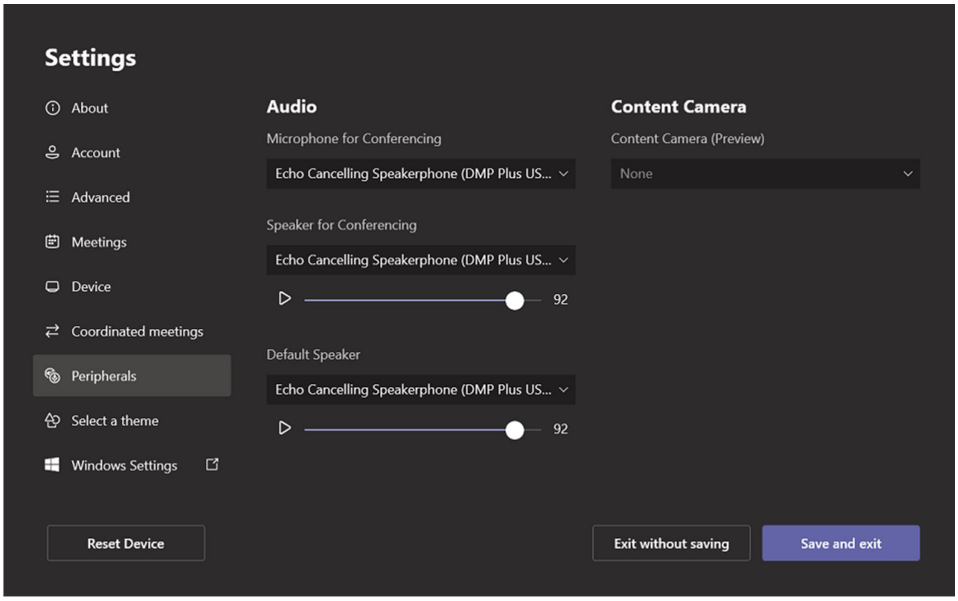


Figure 22. Microsoft Teams Rooms Peripherals Dialog Box

4. When you are finished, click **Save** and exit to return to the user interface.

NOTE: When using the Extron DMP 64 Plus, MTR disables its internal acoustic echo cancellation (AEC) audio processing so that all audio processing is completed through the external DSP—the Extron DMP 64 Plus. This provides the best audio performance.

Advanced Settings and Troubleshooting

This section provides the following topics:

- **DMP Plus Acoustic Echo Cancellation (AEC)**
- **Technical Support**

DMP Plus Acoustic Echo Cancellation (AEC)

AEC Setup Overview

Proper gain structure involves the relationship between the signal at the selected reference and the signal at the mic input, within the context of proper levels for the reference and mic inputs independently. The mic input gain setting will naturally be optimized for the voice level of the talker in that room; therefore, the amount of signal from the far end that is picked up by the mic is dependent on how much that far end signal is being amplified in the near end room and the distance from the mic to the speakers.

The reference signal is the signal received from the far end, which arrives at the USB-assigned Aux Inputs of the DMP Plus. This is sent to the sound reinforcement system within the near end room, as well as a designated output channel to set the reference level for the DMP Plus AEC processor.

AEC Dialog

The AEC dialog contains meters and indicator LEDs that are essential for setting up gain structure and monitoring activity.

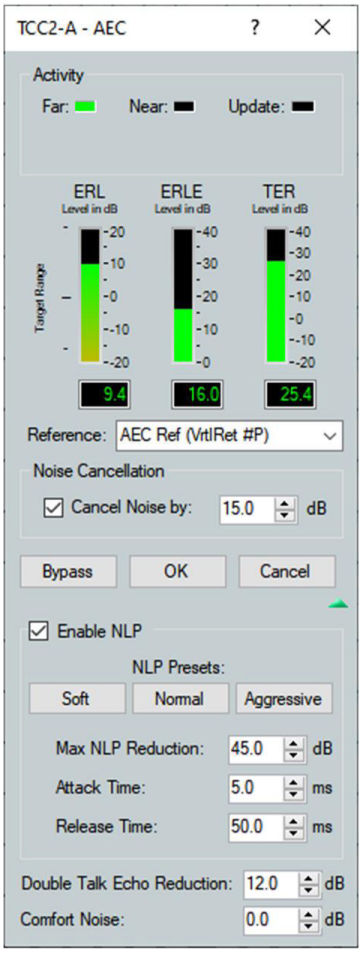


Figure 23. AEC Controls

AEC Indicators

- **Far –** lights when activity is detected from the remote site.
- **Near –** lights when activity is detected from the local site.
- **Update –** lights when the AEC is updating, i.e., converging or reconverging.

Meters

- **ERL –** the ratio in dB between the signal at the reference and the signal at the AEC channel input. When ERL is a positive number, the signal level at the AEC channel input is lower than the signal at the selected reference.

NOTE: The ideal level range for these meter is 0 to +15 dB. This ensures the right amount of reference signal is being sent through the AEC processor..

- **ERLE –** the amount in dB of potential echo signal that the AEC algorithm, not including NLP processing, is cancelling.
- **TER –** the sum of ERL + ERLE, in dB.

Select Reference

The provided configuration includes a selected AEC reference. If necessary, a different AEC reference can be selected from the drop-down list.

Noise Cancellation

Noise Cancellation may be switched on or off from the AEC dialog. The noise canceller will detect steady state noise, such as HVAC or other continuous system noise, and effectively remove it without causing audible artifacts.

Advanced AEC Controls

Click on the open/collapse icon to expose the advanced AEC controls.

Advanced control functionality is as follows:

Non-linear processing (NLP) controls

- **Enable NLP –** this box is checked by default. Non-linear processing is necessary for the complete removal of echo.
- **NLP Presets –** click a button to load a set of values to the three NLP parameters.
- **Max NLP Reduction –** the maximum possible reduction in echo artifacts that can be applied.
- **Attack Time –** the speed in which NLP is applied.
- **Release Time –** the speed in which NLP is released.

Additional controls

- **Double Talk Echo Reduction –** sets the amount of echo reduction applied during double-talk.
- **Comfort Noise –** sets a comfort noise level in dB to eliminate states of complete silence, which may be perceived as a failed connection.

Technical Support

For Extron technical support, visit: **https://www.extron.com/company/contactus.aspx**

For Sennheiser technical support, visit: **https://sennheiser.com/service-support**

Extron Warranty

Extron warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Asia:
Extron Asia Pte Ltd
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Japan:
Extron Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Middle East:
Extron Middle East
Dubai Airport Free Zone
F13, PO Box 293666
United Arab Emirates, Dubai

Africa:
Extron South Africa
3rd Floor, South Tower
160 Jan Smuts Avenue
Rosebank 2196, South Africa

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA:	714.491.1500 or 800.633.9876	**Asia**:	65.6383.4400
Europe:	31.33.453.4040 or 800.3987.6673	**Japan**:	81.3.3511.7655
Africa:	27.11.447.6162	**Middle East**:	971.4.299.1800

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.