MXN5-C

Microflex™ Networked Ceiling Loudspeaker

Shure MXN5-C loudspeaker user guide. Learn how to install and control this PoE-powered ceiling loudspeaker. Control it with other Shure devices in Designer.

Version: 6 (2020-F)

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MXN5-C
Microflex™ Networked Ceiling Loudspeaker

IMPORTANT SAFETY INSTRUCTIONS

1. READ these instructions.
2. KEEP these instructions.
3. HEED all warnings.
4. FOLLOW all instructions.
5. DO NOT use this apparatus near water.
6. CLEAN ONLY with dry cloth.
7. DO NOT block any ventilation openings. Allow sufficient distances for adequate ventilation and install in accordance with the manufacturer's instructions.
8. DO NOT install near any heat sources such as open flames, radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Do not place any open flame sources on the product.
9. DO NOT defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. PROTECT the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. ONLY USE attachments/accessories specified by the manufacturer.
12. USE only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



13. UNPLUG this apparatus during lightning storms or when unused for long periods of time.
14. REFER all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. DO NOT expose the apparatus to dripping and splashing. DO NOT put objects filled with liquids, such as vases, on the apparatus.
16. The MAINS plug or an appliance coupler shall remain readily operable.
17. The airborne noise of the Apparatus does not exceed 70dB (A).
18. Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.
19. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
20. Do not attempt to modify this product. Doing so could result in personal injury and/or product failure.
21. Operate this product within its specified operating temperature range.

	This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.
	This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

General Description

The Shure MXN5-C Microflex Networked Ceiling Loudspeaker provides high-quality speech reproduction for A/V conferencing applications. With a low-profile design optimized for easy installation in drop ceiling configurations, the MXN5 integrates seamlessly with other Shure networked PoE-enabled audio devices using the Dante audio networking protocol.

Features

Loudspeaker technical elements

- Pre-tuned frequency response optimized for voice intelligibility in A/V conferencing applications
- Low-profile, shallow-can design compatible with most drop ceiling installations
- 2-way driver system with 5.25 inch woofer
- PoE/PoE+ enabled, eliminating the need for an outboard amplifier
- Integrated Shure DSP Utilities: EQ, delay, limiter, and signal/tone generator
- 2 Dante inputs and 1 Dante output
- AES67 compatible

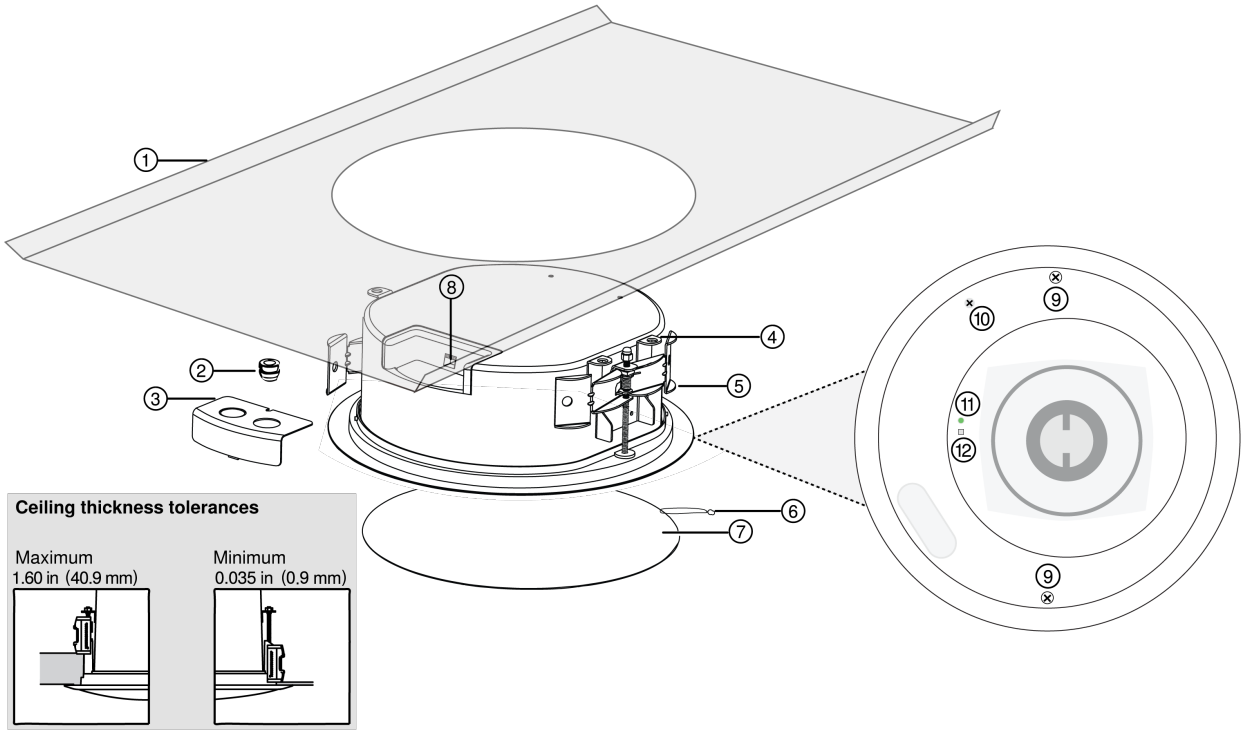
Software-based configuration and control

- Shure Designer System Configuration software for easy setup and configuration
- SystemOn Audio Asset Management software for remote management and troubleshooting
- Shure network audio encryption

Clean design elements

- Aesthetic design subtly blends into drop ceiling environments
- Removable magnetic and paintable grille seamlessly covers the entire speaker
- Removable Shure logo
- UL 2043 plenum rated
- Tile bridge accessory for quick and easy mounting

MXN5-C Loudspeaker Parts



1. Tile bridge (not included)
2. Flexible conduit clamp
3. Cover plate
4. Secondary attachment point
5. Mounting arms
6. Grille safety restraint (nylon 6/6)
7. Grille
8. Network port
   - Network speed LED (amber):
     Off = 10/100 Mbps
     On = 1 Gbps
   - Network status LED (green):
     Off = No network link
     On = Network link established
     Flashing = Network link active
9. Screws for mounting arms
10. Post for grille safety restraint
11. Power LED
12. Reset button

What's in the Box

- Loudspeaker
- Magnetic grille with removable Shure logo

- Flexible conduit clamp
- Cover plate

Installing the Ceiling Loudspeaker

For ceiling tile installations, use the tile bridge accessory to support the weight of the loudspeaker. You can install the loudspeaker in other types of ceilings if the material safely supports the weight of the loudspeaker.

To install, you will need:

- Utility knife or other tool to cut hole in ceiling
- Shielded Cat5e (or better) Ethernet cable
- Screwdriver or drill
- Braided metal cable or other high-strength wire for secondary attachment point (not included)
- Tile bridge for ceiling tile installations (not included)
- Pre-construction bracket for other types of ceilings (not included)

Tile Ceilings

1. Use the loudspeaker packaging or the tile bridge to mark a cutout in the tile.
2. Cut a 10.5 in. (266 mm) hole in the tile with the cutting tool.
3. Reinstall the ceiling tile with the tile bridge on top of the tile.



4. Follow the steps to connect the loudspeaker.

All Other Ceilings

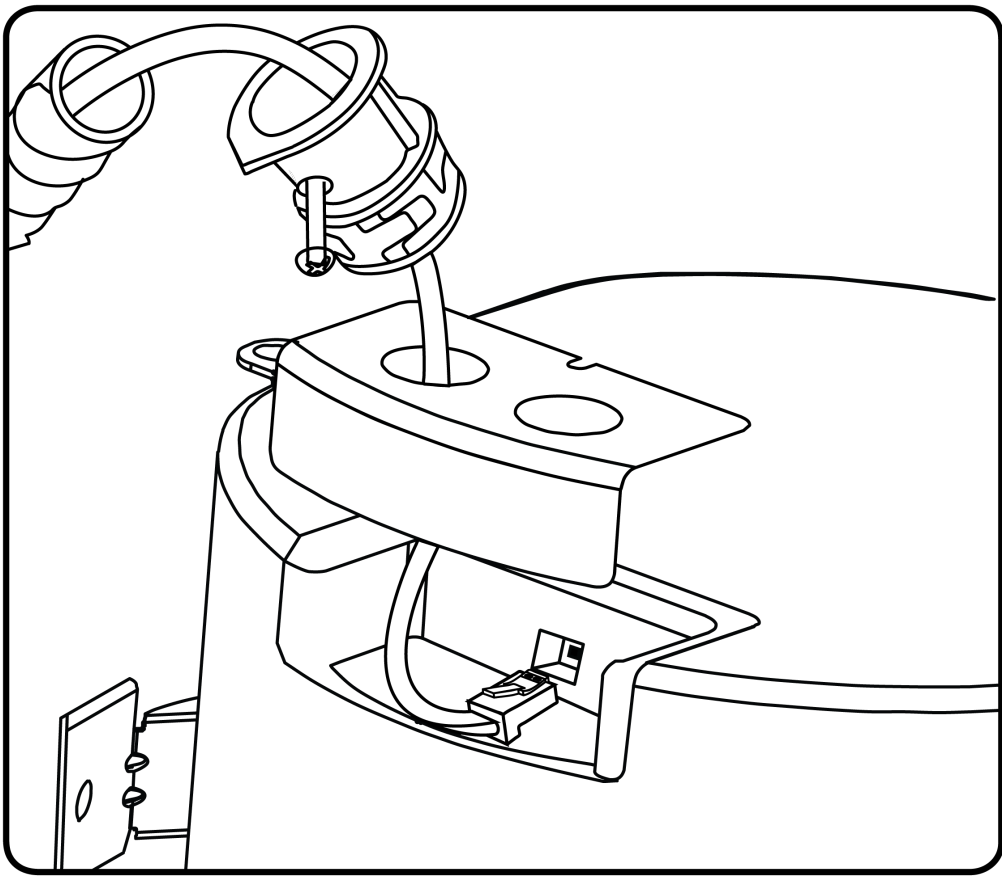
1. In an unfinished ceiling, nail or screw the pre-construction bracket to the ceiling joists. Install the Cat5e cable above the ceiling joists. Complete any finish work required on the ceiling.

   The pre-construction bracket helps distribute the weight of the loudspeaker in the ceiling.

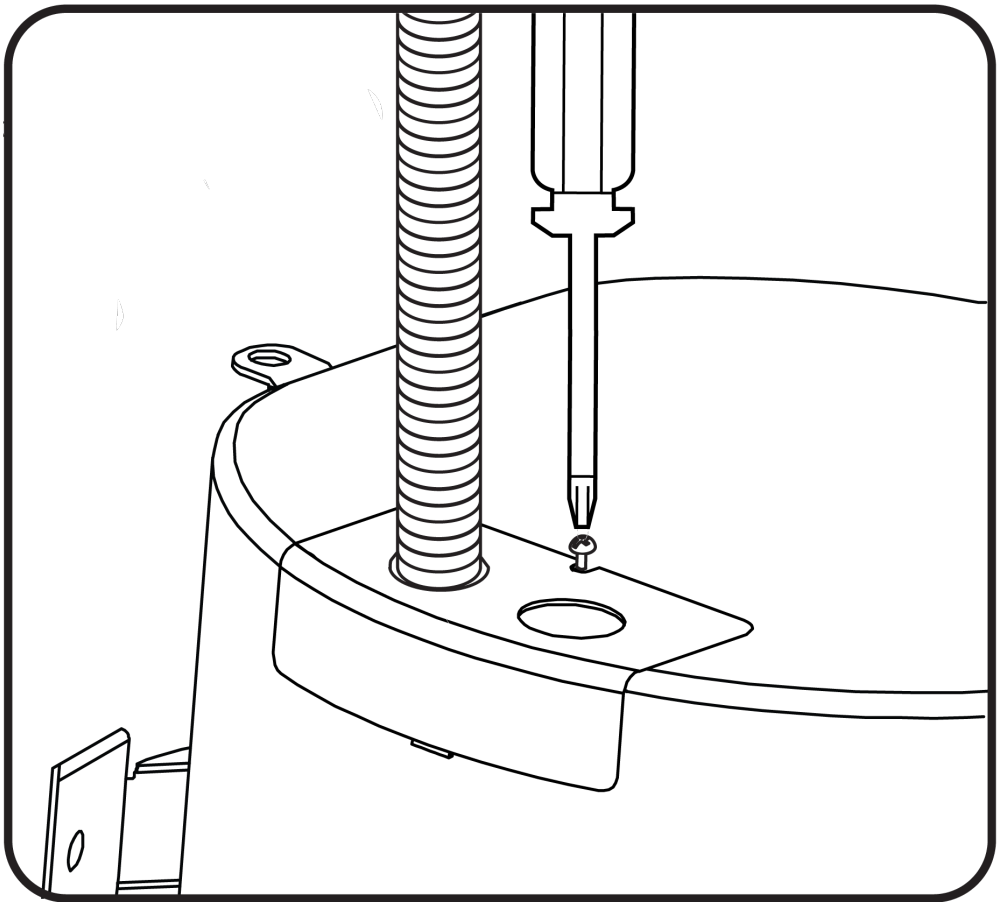
2. Use the loudspeaker packaging to mark a cutout in the ceiling material.
3. Cut a 10.5 in. (266 mm) hole in the ceiling material.
4. Follow the steps to connect the loudspeaker.

Connecting the Loudspeaker

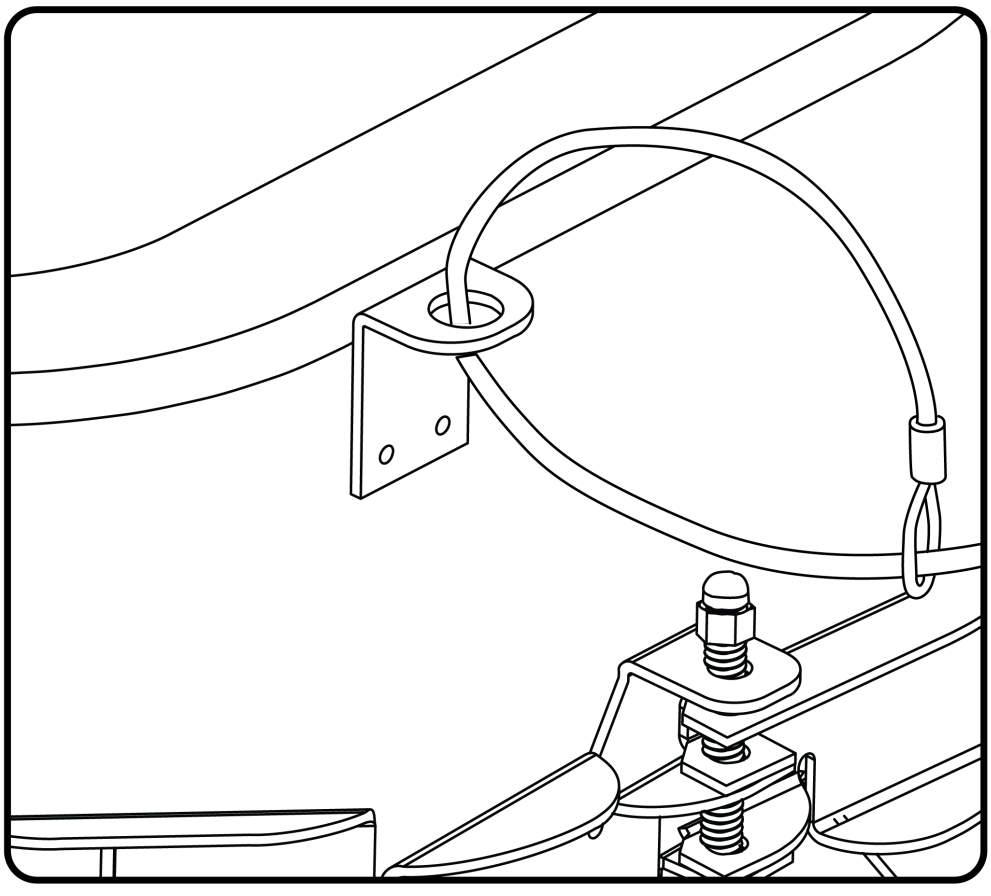
1. Attach the Cat5e cable to the loudspeaker. If conduit is required, run the Cat5e cable through conduit and attach to the loudspeaker.



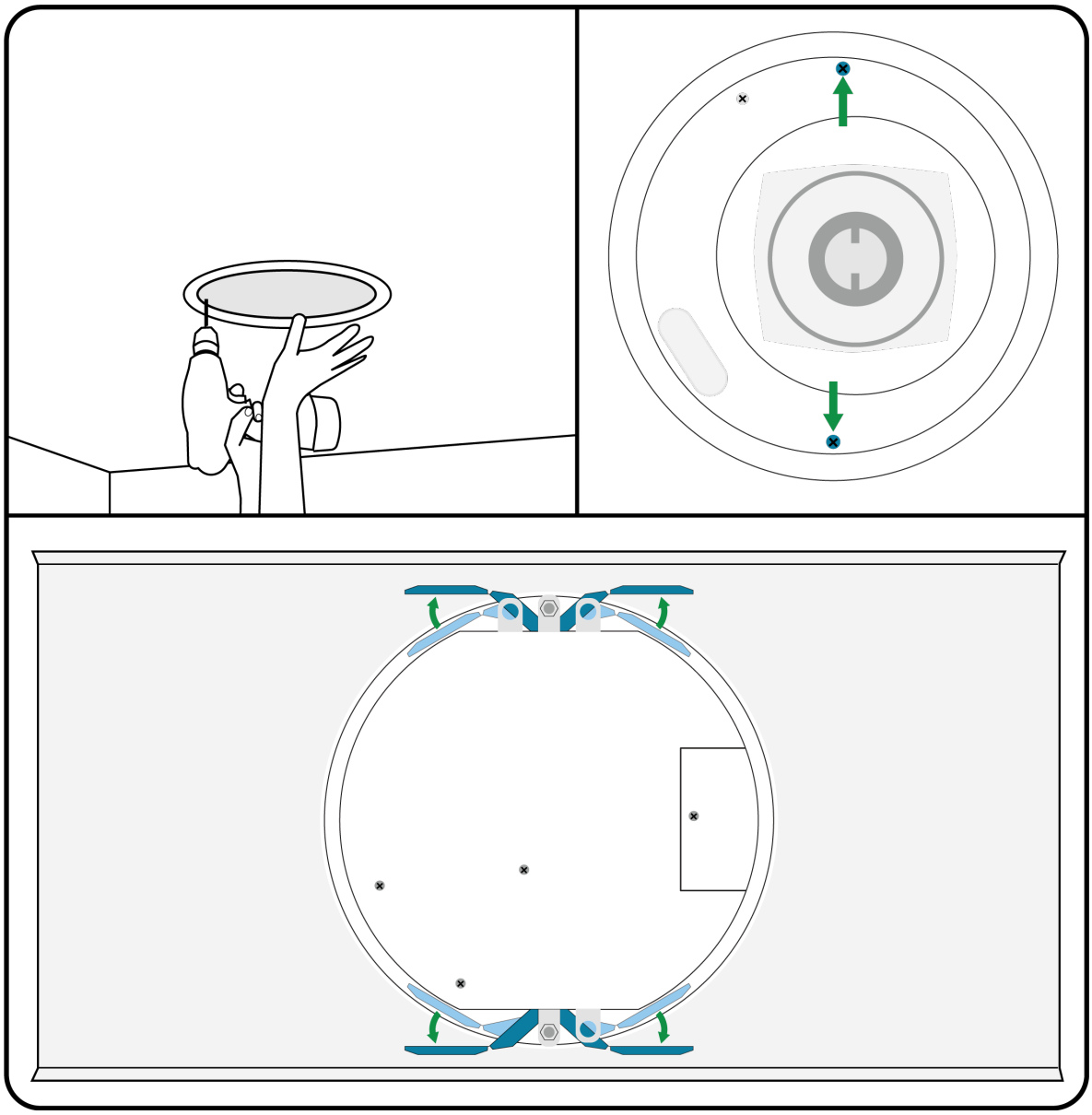
2. Attach the cover plate with the screwdriver. If using conduit, push the conduit connector into the knockout.



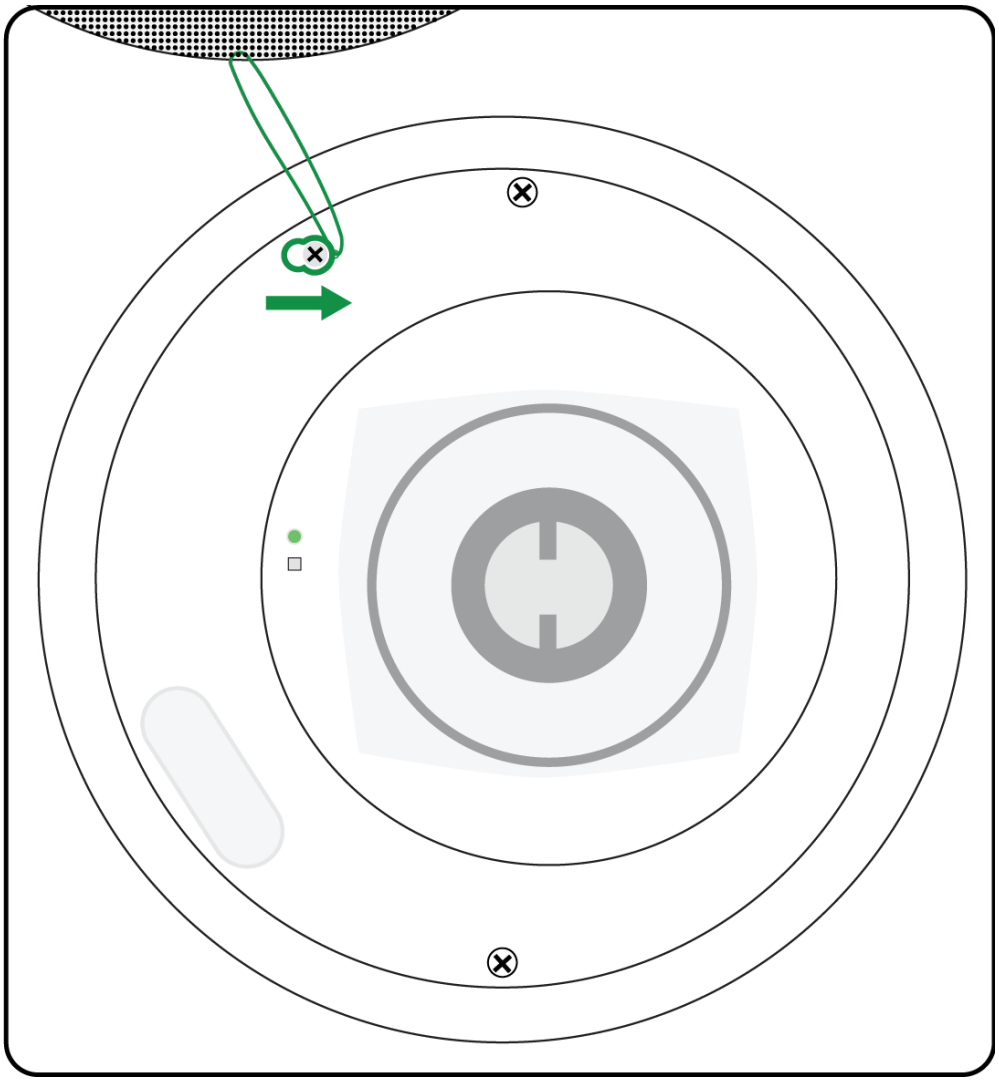
3. Attach cable to the loudspeaker's secondary attachment point and to an attachment point in the ceiling. This cable provides additional mounting security.



4. Place the loudspeaker in the mounting hole. Tighten the screw on each side of the loudspeaker until each mounting arm fully expands to the secure the loudspeaker. Do not over-tighten the screws.



5. Slide to attach the grille safety restraint to the post on the loudspeaker. Do not unscrew the screw to attach the restraint.



6. Attach the magnetic grille to the loudspeaker. The Shure logo is also magnetic, so you can reposition or remove it if necessary.

Connecting to Power

Shure recommends using Power over Ethernet Plus (PoE+) to power this device. Power over Ethernet (PoE) can also power the device, but will result in lower volume levels.

Use one of the following to provide PoE+:

- Network switch with PoE+
- PoE+ injector device

The PoE/PoE+ source must also be a gigabit device.

Reset Button

To access the reset button, remove the grille.

There are 2 hardware reset options:

Network reset (press button for 4-8 seconds)

Resets all Shure control and audio network IP settings to factory defaults.

Full factory reset (press button for longer than 8 seconds)

Resets all network and Designer settings to the factory defaults.

Power LED Behavior

LED Behavior	Device State
Solid green, then off	Device powering on
Green flashing for 30 seconds	Device identify
After 4 seconds, green flashing	Network reset
Green flashing after 4 seconds, green solid after 8 seconds	Full factory reset
Red	Error (Check event log for details)
Solid amber	Firmware update in progress

Painting the Grille

You can paint the loudspeaker's grille to match the surroundings. For best results:

- Use a professional painting house.
- Only paint the grille after removing it from the loudspeaker.
- Remove the magnetic Shure logo before painting.

Controlling Devices with Shure Designer Software

To control this device's settings, use Shure Designer software. Designer enables integrators and system planners to design audio coverage for installations using MXA microphones and other Shure networked devices.

To access your device in Designer:

1. Download and install Designer on a computer connected to the same network as your device.
2. Open Designer, and check that you're connected to the correct network in Settings.
3. Click Online devices. A list of online devices appears.
4. To identify devices, click the product icon to flash the lights on a device. Select your device in the list and click Configure to control device settings.

Learn more at shure.com/designer.

You can also access basic device settings using Shure Web Device Discovery. Full control is available in Designer.

SystemOn Compatibility

You can monitor and manage this device using Shure SystemOn software. Install SystemOn to:

- Remotely monitor Shure devices across networks

- Receive real-time alerts about critical issues, such as low batteries or missing transmitters
- Control access to devices with user profiles

Learn more at shure.com.

Loudspeaker Dante Channels

The loudspeaker has 2 Dante input channels and 1 Dante output channel.

Using the Dante Inputs

The 2 Dante input channels are summed and sent to the loudspeaker's output. These input channels are useful if you need to send a far-end signal and program audio to the loudspeaker.

Using the Dante Output

The Dante output is useful if you need to send the loudspeaker's signal to another loudspeaker or to an AEC reference channel. There are 2 processing options for Dante output signal:

Pre-DSP

Sends a pre-DSP signal to the Dante output (DSP is still applied to loudspeaker output). Use this option to send the signal to another loudspeaker. This option prevents DSP blocks from stacking on top of each other.

Post-DSP

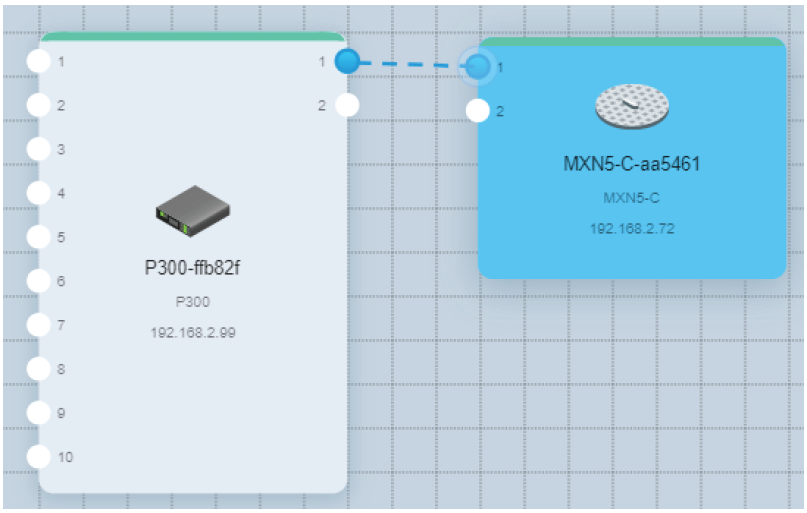
Sends a post-DSP signal to the Dante output. Use this option to send the loudspeaker's signal to an AEC reference channel on an MXA910.

Routing Signals to the Loudspeaker

To route audio to the loudspeakers, you can use Shure Designer software or Dante Controller software.

1. In Designer, create a location that has all loudspeakers and any Dante audio sources.
    - Shure's P300 or ANI processors are easy ways to manage Dante signals from many sources.
2. Go to Routing. Drag and drop from the audio source output to the loudspeaker input to create Dante routes.

    If you're sending a signal from one loudspeaker to another, use a pre-DSP signal.



Routing Signals to Multiple Loudspeakers

In rooms with multiple loudspeakers installed, you can route a signal from one loudspeaker to another using the Dante output channel, or you can route the signal to each loudspeaker individually.

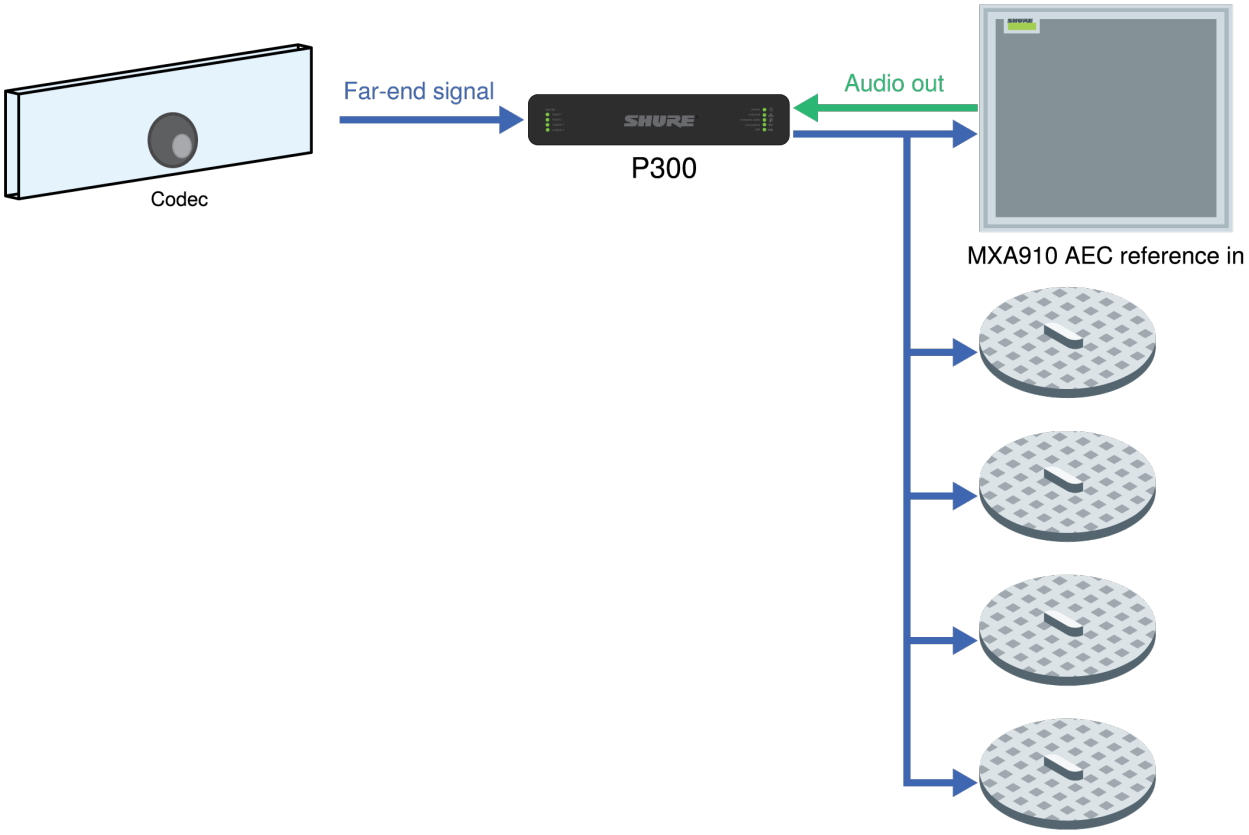
Routing to Each Loudspeaker Individually

Use this method when:

- Signal comes from device with Brooklyn II chip, such as a P300 **or**
- Signal comes from device with Ultimo chip transmitting in multicast

Learn more about Dante flows in our FAQs or from Audinate.

If you're using a Shure P300 or other devices with high unicast Dante flow limits, route a signal to each loudspeaker individually using Designer or Dante Controller.



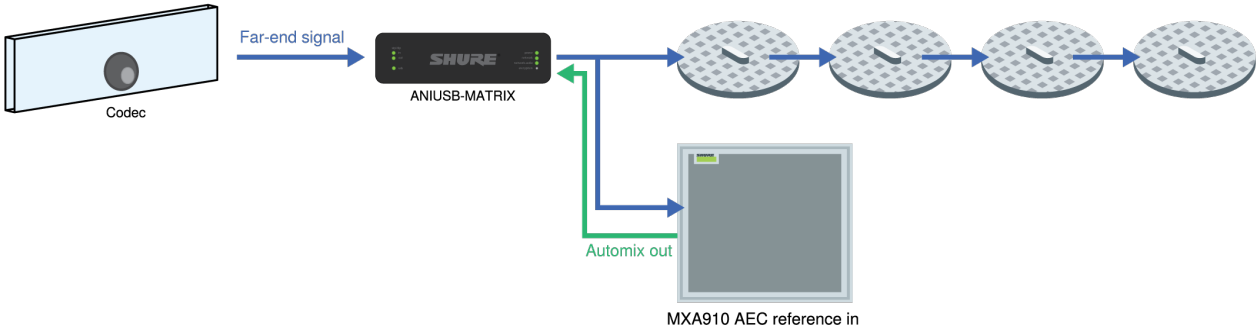
Routing Signals from Loudspeaker to Loudspeaker

Use this method when:

- Signal comes from device with Ultimo chip transmitting in unicast, such as Shure ANI

Learn more about Dante flows in our FAQs or from Audinate.

If you encounter unicast Dante flow limits, route from one loudspeaker to another using the Dante output channel.



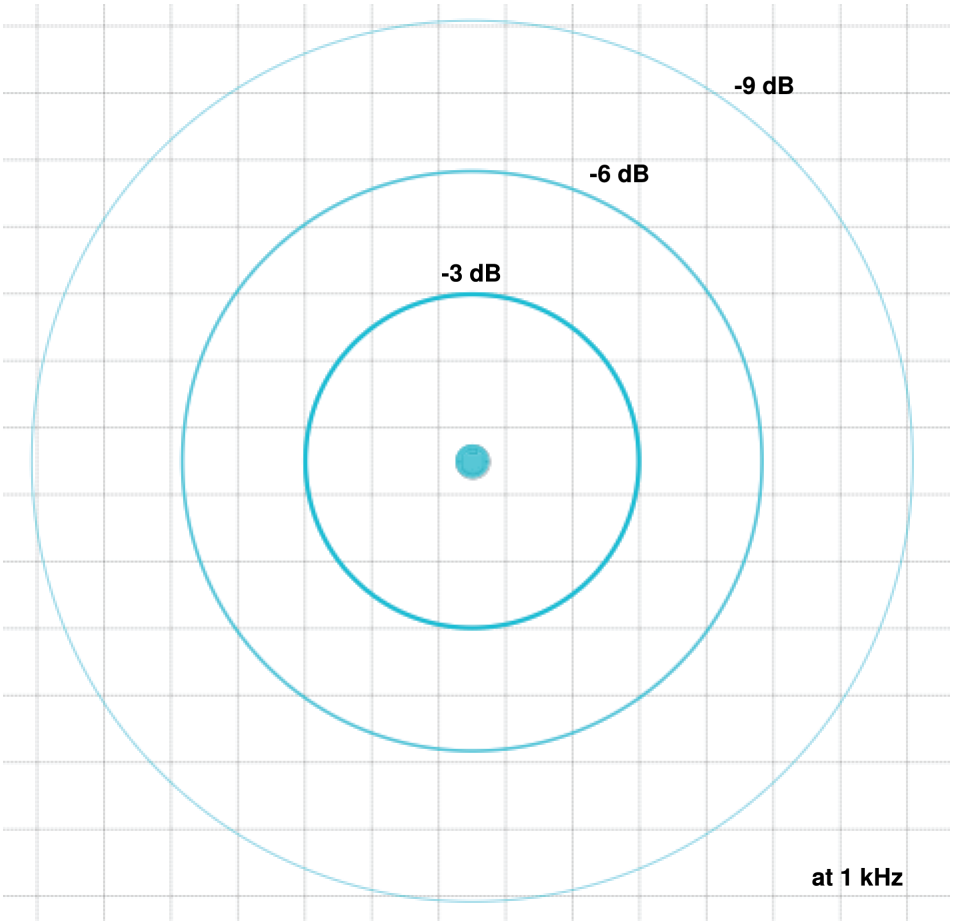
1. In Designer, put all of the loudspeakers and other devices you want to route to in the same location.
2. Route the signal to the first loudspeaker.
3. Open the first loudspeaker's configuration window in Designer.
4. Choose Pre-DSP in the Dante output signal menu. This prevents DSP blocks from stacking on top of each other in the signal chain.

5. Use Designer or Dante Controller to route the signal from the first loudspeaker to the next one. Repeat this process for each additional loudspeaker.

Setting Device Height and Listener Height

To accurately display loudspeaker coverage, set the device height and listener height in Designer.

1. Add the loudspeaker to a location and go to `[Your location]` > `Coverage map`.
2. Select the loudspeaker and go to `Properties` > `Position` to adjust:
   - X/Y position in location grid
   - Device height
   - Listener height
3. Set the device height and listener height for accurate coverage information. The 3 rings represent -3, -6, and -9 dB at 1 kHz. The rings move as you adjust device height and listener height to show loudspeaker coverage.



EASE files are available at shure.com.

DSP Settings

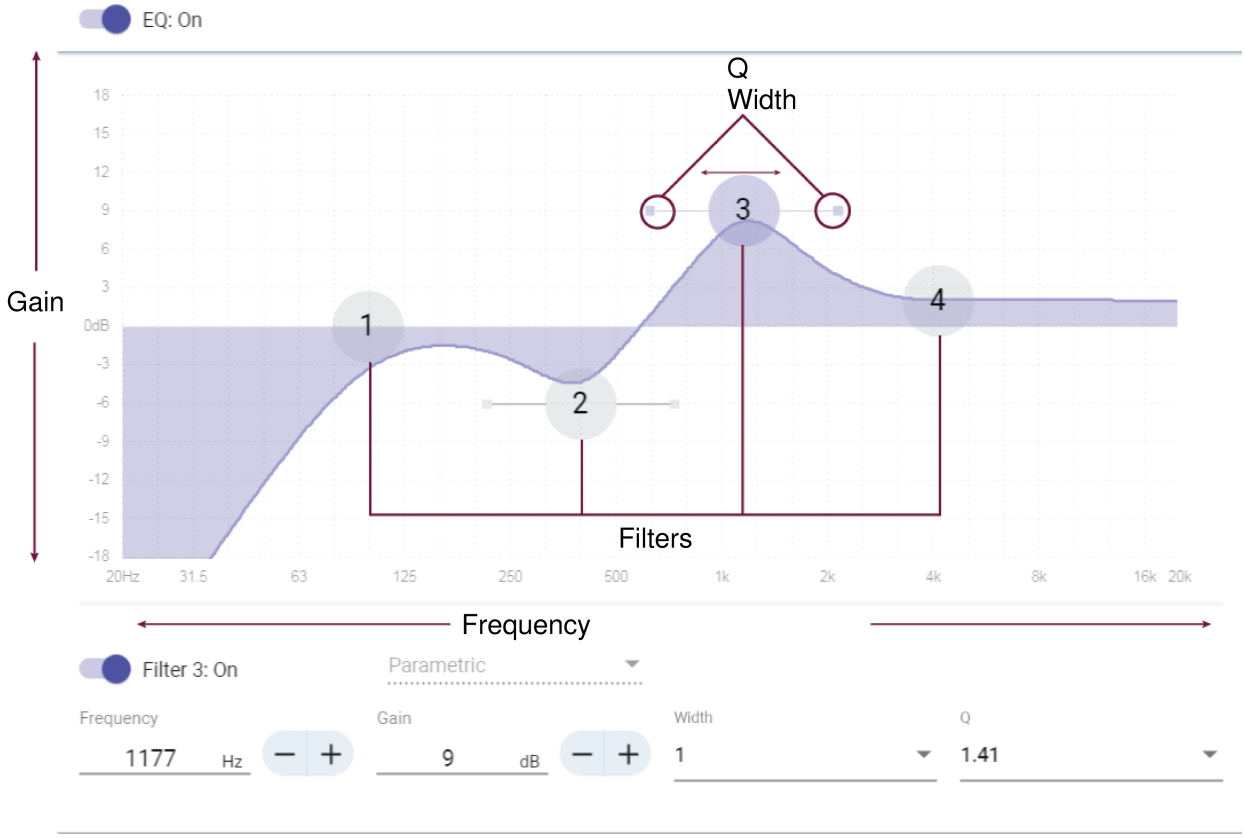
Parametric Equalizer (PEQ)

Maximize the loudspeaker's audio quality by adjusting the frequency response with the parametric equalizer (PEQ).

Common equalizer applications:

- Improve speech intelligibility
- Reduce room irregularities
- Tune system for even and consistent coverage

4-Band Equalizers



Filter Types:

Parametric: Attenuates or boosts the signal within a customizable frequency range.

Low Cut: Rolls off the audio signal below the selected frequency.

Low Shelf: Attenuates or boosts the audio signal below the selected frequency.

High Cut: Rolls off the audio signal above the selected frequency.

High Shelf: Attenuates or boosts the audio signal above the selected frequency.

Frequency

Select the center frequency of the filter to cut/boost..

Gain

Adjusts the level for a specific filter (+/- 18 dB).

Q

Adjusts the range of frequencies affected by the filter. As this value increases, the bandwidth decreases.

Width

Adjusts the range of frequencies affected by the filter. The value is represented in octaves.

Note: *The Q and width parameters affect the equalization curve in the same way. The only difference is the way the values are represented.*

Delay

If you're installing loudspeakers in a large area, you may need to time-align some speakers using delay. This ensures that the signal arrives to all parts of the room at the same time for even coverage.

Delay range: 0-160 ms

Limiter

Use the limiter to prevent output signals from clipping or distorting. To use, enter a dBFS value for the threshold. With the limiter enabled, the output signals will not exceed the threshold.

Note: This loudspeaker also has an internal safety limiter to protect the hardware. This limiter only turns on if the output signals reach the loudspeaker's maximum sound pressure level (SPL).

Signal Generator

The signal generator plays 4 different signals to help you tune your system and balance sound levels. Dante inputs get bypassed when you use the signal generator. The signal generator is pre-EQ, so you can apply EQ to the signal.

Gain adjustment at 0 dB is referenced to 76 dB SPL at 1 meter.

Pink noise

Equal energy per octave. Use to check levels and to verify coverage in multi-speaker installations.

White noise

Equal energy at each frequency. Use to check levels and to verify coverage in multi-speaker installations.

Sine wave

Plays a tone at the selected frequency. Use to check levels, assess comb filtering effects, and identify possible standing waves.

Sweep

Plays a tone at every frequency that the loudspeaker can reproduce, starting from the lowest frequency and sweeping up to the highest. Use to identify possible mounting deficiencies, such as rattling or buzzing.

Muting the Loudspeaker

The loudspeaker has multiple mute points for different scenarios:

1. **Dante Input Mute:** Mutes the selected Dante input channel.

2. **Device Mute:** Mutes the speaker output and the Dante output channel.



Encryption

Encryption operates at the location level in live mode only, meaning that all devices included in this location must have these settings. Audio is encrypted with the Advanced Encryption Standard (AES -256), as specified by the US Government National Institute of Standards and Technology (NIST) publication FIPS-197. Encryption is not supported with third-party devices.

To activate encryption:

1. Click Encryption.
2. Select Enable Encryption.

The other options allow you to re-key the encryption or disable it if encryption had previously been enabled and you no longer want it.

Important: For encryption to work:

- Encryption must be universally enabled or disabled on all connected Shure devices in the same location.

- AES67 must be disabled in Dante Controller to turn encryption on or off. AES67 encryption is currently not supported.

AES67

AES67 is a networked audio standard that enables communication between hardware components which use different IP audio technologies. This Shure device supports AES67 for increased compatibility within networked systems for live sound, integrated installations, and broadcast applications.

The following information is critical when transmitting or receiving AES67 signals:

- Update Dante Controller software to the newest available version to ensure the AES67 configuration tab appears.
- Before turning encryption on or off, you must disable AES67 in Dante Controller.
- AES67 cannot operate when the transmit and receive devices both support Dante.

Shure Device Supports:	Device 2 Supports:	AES67 Compatibility
Dante and AES67	Dante and AES67	No. Must use Dante.
Dante and AES67	AES67 without Dante. Any other audio networking protocol is acceptable.	Yes

Separate Dante and AES67 flows can operate simultaneously. The total number of flows is determined by the maximum flow limit of the device.

Sending Audio from a Shure Device

All AES67 configuration is managed in Dante Controller software. For more information, refer to the Dante Controller user guide.

1. Open the Shure transmitting device in Dante Controller.
2. Enable AES67.
3. Reboot the Shure device.
4. Create AES67 flows according to the instructions in the Dante Controller user guide.

Receiving Audio from a Device Using a Different Audio Network Protocol

Third-party devices: When the hardware supports SAP, flows are identified in the routing software that the device uses. Otherwise, to receive an AES67 flow, the AES67 session ID and IP address are required.

Shure devices: The transmitting device must support SAP. In Dante Controller, a transmit device (appears as an IP address) can be routed like any other Dante device.

Switch and Cable Recommendations for Dante Networking

Switches and cables determine how well your audio network performs. Use high-quality switches and cables to make your audio network more reliable.

Network switches should have:

- Gigabit ports. 10/100 switches may work on small networks, but gigabit switches perform better.
- Power over Ethernet (PoE) or PoE+ ports for any devices that require power
- Management features to provide information about port speed, error counters, and bandwidth used

- Ability to switch off Energy Efficient Ethernet (EEE). EEE (also known as "Green Ethernet") may cause audio dropouts and problems with clock synchronization.
- Diffserv (DSCP) Quality of Service (QoS) with strict priority and 4 queues

Ethernet cables should be:

- Cat5e or better
- Shielded

Dante Flows for Shure Devices

Dante flows get created any time you route audio from one Dante device to another. One Dante flow can contain up to 4 audio channels. For example: sending all 5 available channels from an MXA310 to another device uses 2 Dante flows, because 1 flow can contain up to 4 channels.

Every Dante device has a specific number of transmit flows and receive flows. The number of flows is determined by the type of Dante chip used in the device.

Unicast and multicast transmission settings also affect the number of Dante flows a device can send or receive. Using multi-cast transmission can help overcome unicast flow limitations.

Shure devices currently use 2 types of Dante chips:

Dante Platform	Shure Devices Using Plat-form	Unicast Transmit Flow Limit	Unicast Receive Flow Limit
Brooklyn II	ULX-D, SCM820, MXWAPT, MXWANI, MXA910, MXA710, P300	32	32
Ultimo/UltimoX	MXA310, ANI4IN, ANI4OUT, ANIUSB-MATRIX, ANI22, MXN5-C	2	2

Learn more about Dante flows in our FAQs or from Audinate.

EASE Files Available Online

EASE files are available for this device at shure.com.

Specifications

All specifications are within ± 3 dB unless otherwise noted.

Connector Type

RJ45

Power Requirements

Power over Ethernet (PoE) Class 0 or PoE Plus Class 4

Power Consumption

Power over Ethernet (PoE)	12 W maximum (11 W typical)
PoE Plus	24 W maximum (23 W typical)

Weight

6.5 lbs (2.95 kg)

Product Dimensions

12 x 12 x 4 in. (304.8 x 304.8 x 101.6 mm) H x W x D

Control Software

Shure Designer

Plenum Rating

UL 2043 (Suitable for Air Handling Spaces)

Operating Temperature Range

−6.7°C (20°F) to 40°C (104°F)

Storage Temperature Range

−29°C (-20°F) to 74°C (165°F)

Frequency Response (-3 dB)

120 Hz to 20 kHz

Maximum Output Level

At 1 meter

Power over Ethernet (PoE)	92 dB SPL
PoE Plus	98 dB SPL

Coverage Angle

-6 dB at 2 kHz	180 degrees
-6 dB at 10 kHz	107 degrees

Digital Signal Processing

Delay, Limiter, Signal Generator, Equalizer (4-band Parametric)

Latency

Not including Dante latency

1.5 ms

Important Product Information

The equipment is intended to be used in professional audio applications.

Note: This device is not intended to be connected directly to a public internet network.

Changes or modifications not expressly approved by Shure Incorporated could void your authority to operate this equipment.

CAN ICES-3 (B)/NMB-3 (B)

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Please follow your regional recycling scheme for batteries, packaging, and electronic waste.

Information to the user

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to 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.

The CE Declaration of Conformity can be obtained from: www.shure.com/europe/compliance

Authorized European representative:
Shure Europe GmbH
Headquarters Europe, Middle East & Africa
Department: EMEA Approval
Jakob-Dieffenbacher-Str. 12
75031 Eppingen, Germany
Phone: +49-7262-92 49 0
Fax: +49-7262-92 49 11 4
Email: info@shure.de

This product meets the Essential Requirements of all relevant European directives and is eligible for CE marking.

The CE Declaration of Conformity can be obtained from Shure Incorporated or any of its European representatives. For contact information please visit www.shure.com

Optional Accessories and Replacement Parts

Tile bridge	A-MXN5-TB
New construction bracket	A-MXN5-NCB
Magnetic grille and Shure logo	RPMXN5-G

Clamp cover conduit	RPMXN5-C