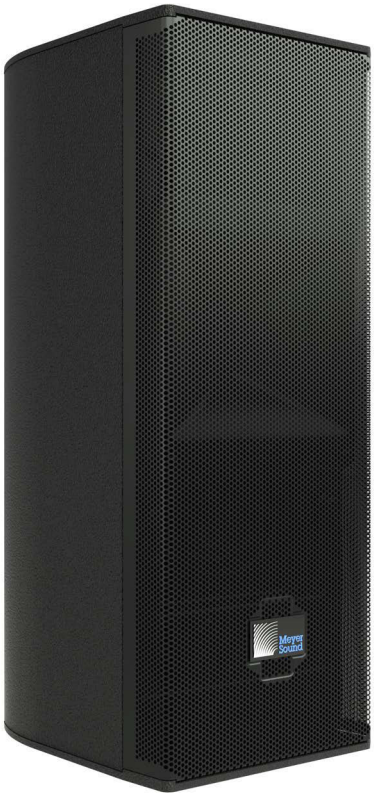
Type 3M Audio Input Module: Connecting AVB Audio Signals



Keep these important instructions.
Check meyersound.com for updates.

Type 3M Audio Input Module Set Up Guide, PN 05.301.015.01 B

CONTENTS

INTRODUCTION

HOW TO USE THIS MANUAL

Please read these instructions in their entirety before configuring a Meyer Sound loudspeaker system. In particular, pay close attention to material related to safety issues.

As you read these instructions, you will encounter the following icons for notes, tips, and cautions:

NOTE: A note identifies an important or useful piece of information relating to the topic under discussion.

TIP: A tip offers a helpful tip relevant to the topic at hand.

CAUTION: A caution gives notice that an action may have serious consequences and could cause harm to equipment or personnel, or could cause delays or other problems.

Information and specifications are subject to change. Updates and supplementary information are available at:

- meyersound.com/products
- meyersound.com/documents.

Meyer Sound Technical Support is available at:

- +1 510 486.1166
  (Monday through Friday 9:00 am to 5:00 pm PST)
- +1 510 486.0657
  (after hours support)
- meyersound.com/support.

MILAN INPUT MODULES

Loudspeakers equipped with the optional Milan AVB Endpoint Type 3M audio input module receive an audio signal over an Ethernet network transmitted by another Milan AVB capable device. Using software, the Milan AVB signal is “patched” from a “talker” to a “listener.” In the following example, a Galileo GALAXY processor sends an audio signal over the network to two ULTRA-X20 loudspeakers. Meyer Sound Compass Control Software is used to make AVB connection between the GALAXY AVB Talker and the ULTRA-X20 AVB Listener.

Available Loudspeaker Models

As of May 2021:

- ULTRA-X20/22/23
- USW-112P

Milan Endpoint Details

The Milan Endpoint (MEP) Type 3M audio input module can receive one AVB channel from one AVB stream via the Ethernet connector. The speed of the connection is 100 Mbps. The input format is Milan AVB, AAF, 96kHz. The media clock is recovered from the incoming AVB stream.

When a Milan endpoint loudspeaker that was previously subscribed to an AVB stream/channel is powered on, it will reproduce the incoming signal in about 40 seconds after power is applied, if the hardware is connected to the network in the same manner.

Milan Endpoint Type 3M Audio Input Module

There are three indicators on the Type 3M Audio Input module.

- **On/Status** LED

  This light will be solid green when the module is powered on and has finished all internal self tests.

- **Wink** button with LED

  This push button toggles the AVB “Identify” indicator. Compass software or an AVB Controller can highlight the on-screen entry for this loudspeaker when the Wink button is pressed. It is also possible to turn on the **Wink** button LED from the software to identify a specific loudspeaker.

  When pressed and released, the **Wink** button LED toggles between dark and solid green.

  NOTE: When the **Wink** button is pressed and held, the **On/Status** LED will turn solid red. This is normal.

- **Ethernet/Network** LED

  Just to the left of the 8P8C Ethernet Connector is an LED with the symbol for Network  above it. This light will be solid yellow when a valid Ethernet connection has been made. The network speed is 100bT.

INSTRUCTIONS

1. MAKE HARDWARE CONNECTIONS

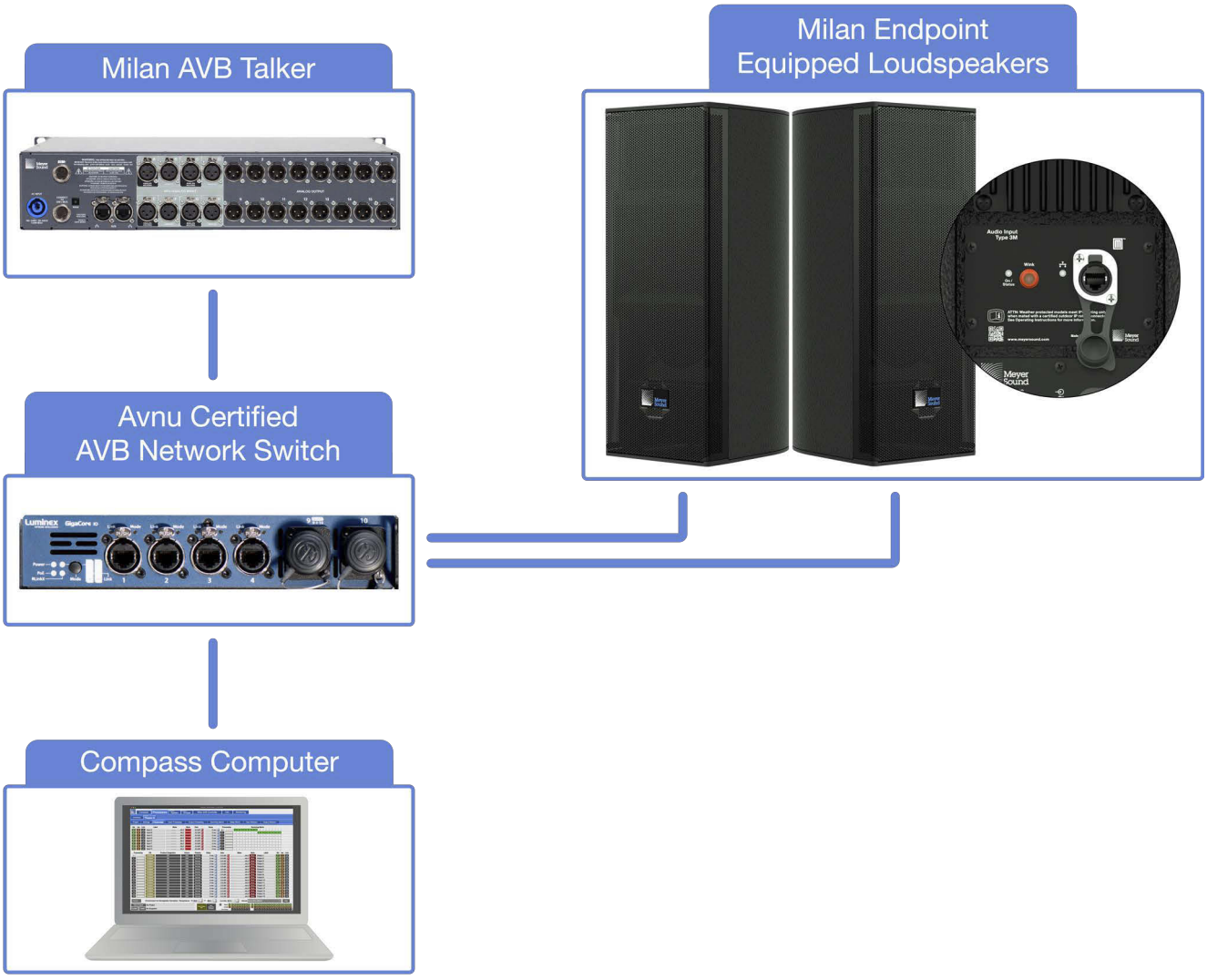
At the core of using Milan AVB is the network. There are three parts that must be connected to the network: the signal sender, an AVB Talker; the signal receiver, an AVB Listener; and the AVB Controller that is used to set up the signal connection over the network between the Talker and the Listener.

NOTE: A list of Avnu-certified AVB compliant network switches is available at avnu.org. Enterprise grade switches may need a firmware module installed or activated to enable AVB functions. Other switches come with AVB already enabled and ready to use.

a. Connect a GALAXY processor, an AVB Talker, to the AVB enabled network switch.

b. Connect the Milan endpoint loudspeakers, Milan AVB Listeners, to the AVB enabled network switch.

c. Connect a computer running Meyer Sound Compass Control Software to the AVB enable network switch. Compass software includes the user interface for the Milan AVB Controller that is in the GALAXY processor.



Ethernet Network Connections

2. POWER ON ALL EQUIPMENT

3. PERFORM COMPASS SOFTWARE STEPS

a. Launch Compass software to perform the next steps.

b. Connect to the GALAXY processor(s) in use (Processors > Inventory tab).

c. Temporarily mute all of the processor outputs to avoid sudden and/or loud sounds when an AVB connection becomes active.

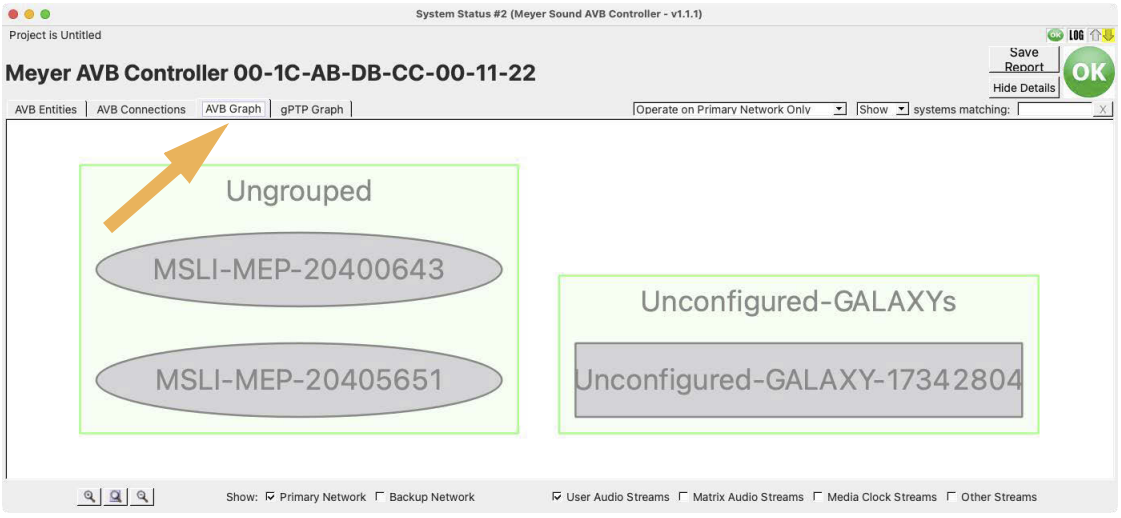
d. Select the **Milan AVB Controller** tab and click **Show AVB Controller** button.

Compass Software, Milan AVB Controller Tab, Select Show AVB Controller

4. PERFORM AVB CONTROLLER STEPS

In the AVB Controller interface:

a. Select the AVB Graph tab.



AVB Controller, Select AVB Graph Tab

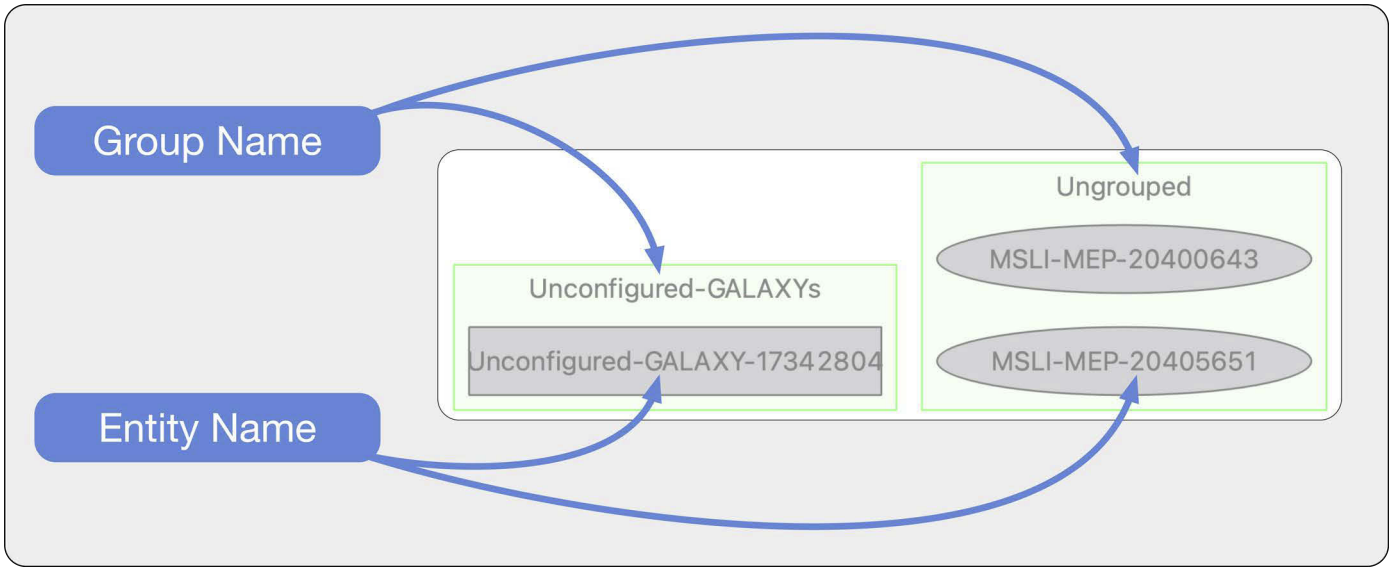
The AVB entities connected to the network are graphically displayed. Each green box represents an AVB Group. Each Group includes icons representing the AVB entities that have the same Group name.

The default entity name of a Milan Endpoint input module is:

<MSLI-MEP> - <serial number>

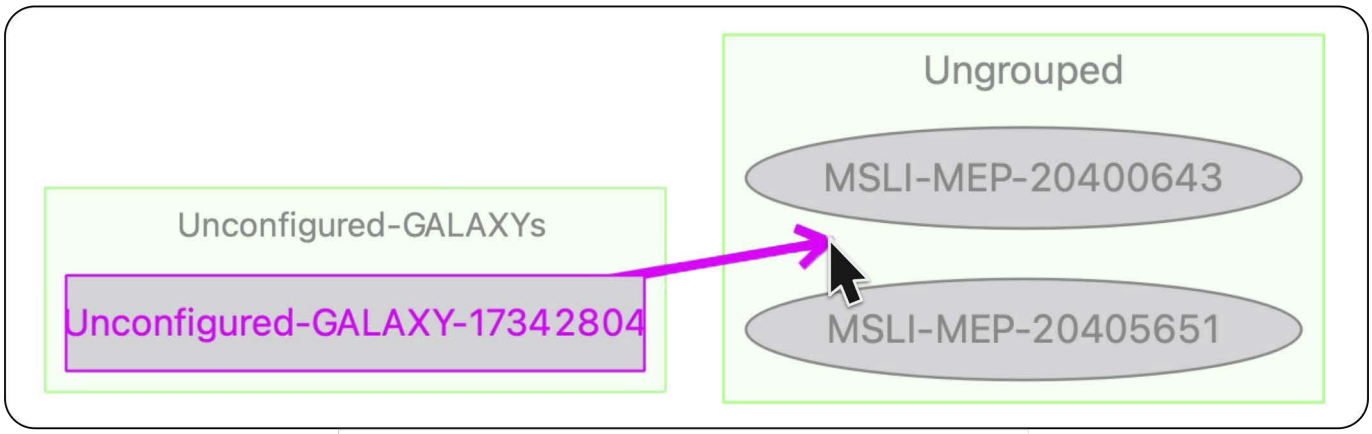
The default entity name of a GALAXY processor is:

Unconfigured-GALAXY- <serial number>



AVB Controller, AVB Graph Tab, Group and Entity Names

b. Click and drag from the GALAXY processor icon to the desired loudspeaker icon; a magenta arrow will be active while dragging. The Talker/Listener window opens, listing the available channels of the Talker and Listener.



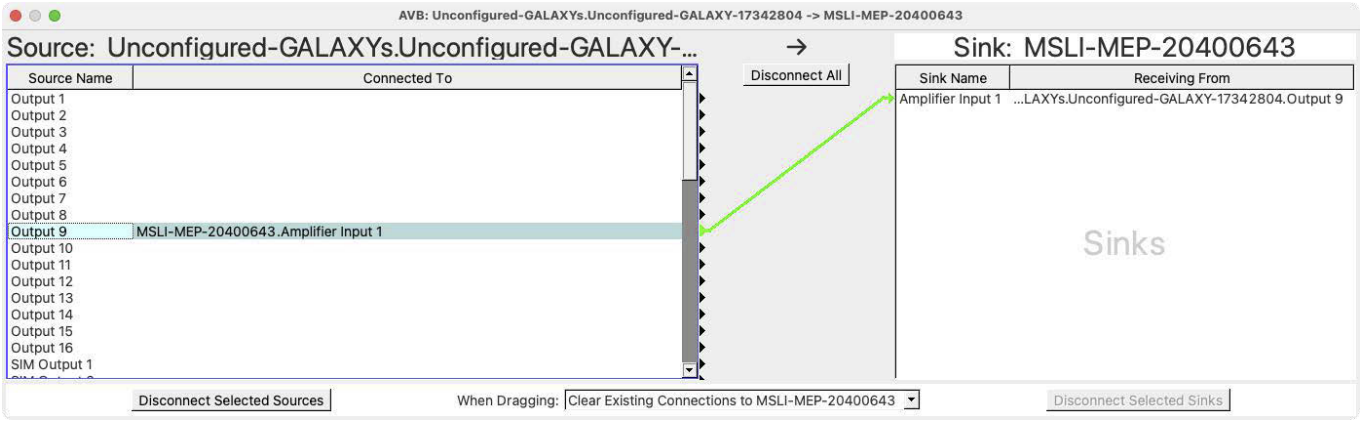
Click and Drag from AVB Source to Loudspeaker with Milan Endpoint Input Module

c. In each of the AVB Connection windows, click and drag a Talker (Source) channel to a Listener (Sink) channel.

Details: All of the GALAXY AVB output channels are listed in the left pane as Talkers. The loudspeaker input is listed in the right pane as a Listener. The GALAXY channels labeled “Output x” have a sample rate of 96 kHz. These outputs are used when connecting to Milan Endpoint Type 3M audio input modules, as these input modules only accept 96 kHz sample rate streams.

The loudspeaker has only one AVB Listener available, listed as “Amplifier Input 1.”

For example, click and drag “Output 9” from the Talker (Source) to the “Amplifier Input 1” of the Listener (Sink). This makes a connection between Output 9 of the GALAXY processor, via AVB, to the loudspeaker input. When the connection is established, the line connecting the Talker and Listener will turn green.



Talker/Listener Window, Drag Talkers to Listeners to “Patch” an AVB Talker to a Listener

NOTE: The AVB Controller is no longer needed and can be closed without saving. However, it can also remain open to monitor network status and connections during operation.

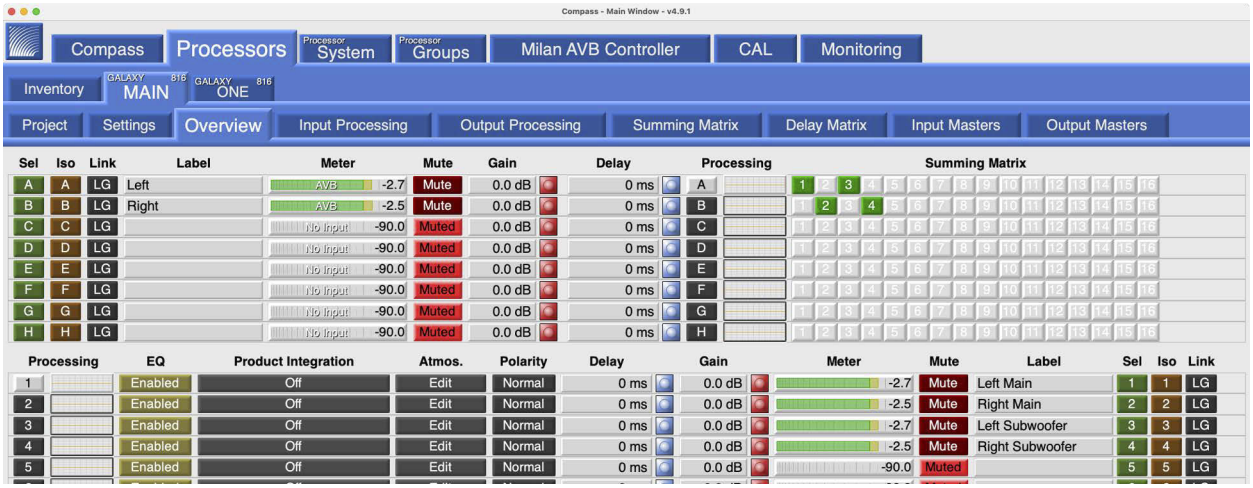
NOTE: The AVB connections are persistent. When the equipment is power cycled, the connections are re-established, provided the equipment is connected to the network in the same manner.

5. REPRODUCE AUDIO

Check for signal presence and then reduce the output level of the AVB Talker device, route the inputs to the connected AVB outputs in the Matrix, and unmute the outputs. The output of the connected AVB Source is now reproduced by the loudspeakers.

NOTE: When the loudspeakers with Milan modules and GALAXY processors are power cycled, the connections are persistent, meaning they will be re-established without the use of Compass or the Meyer Sound AVB Controller.

Details: When AVB connection(s) are made, signals from the output of the GALAXY processor, or another AVB “talker” device, are connected to the loudspeaker input over the Ethernet network. A signal is reproduced by the loudspeaker when there is signal present at the output of a GALAXY processor and an AVB connection has been previously established between the GALAXY processor output and the Milan input of the loudspeaker.



AVB Input Routed to Outputs Connected to Loudspeakers with Milan Endpoint Input Modules

ADDITIONAL INFORMATION

AVB CONNECTION WINDOW FUNCTIONS

In the AVB Connection Window, when dragging from the left pane to the right pane, the behavior follows the selection made in the drop-down menu at the bottom, center of the window labeled **When Dragging:** *(1)*

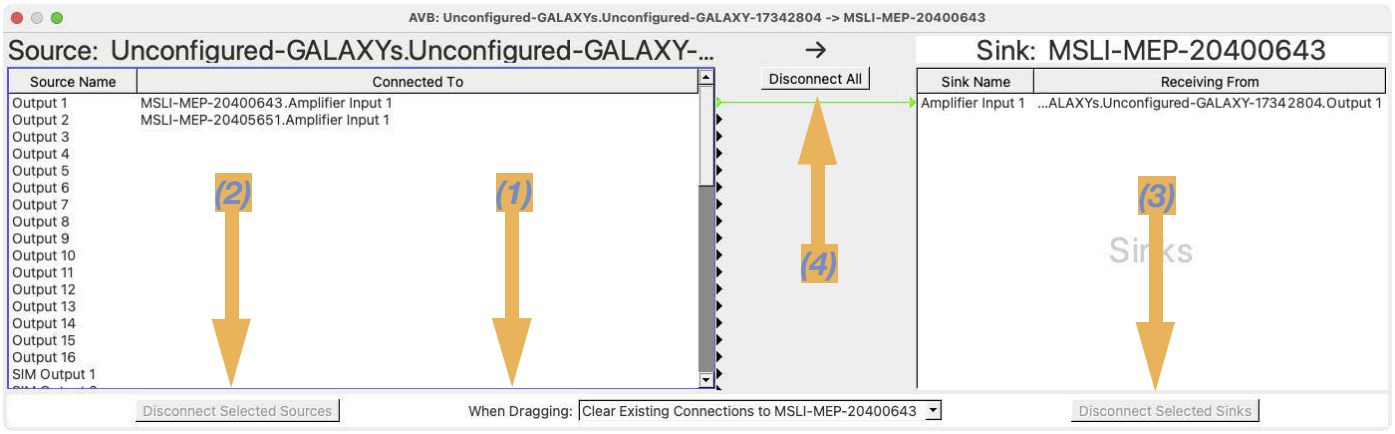
The selections available are:

- Clear Existing Connections
- Clear Existing Connection to <loudspeaker Entity Name>
- Allow Multiple Connections

Loudspeakers with Milan Endpoint Type 3M audio input modules are capable of being connected to one channel of an AVB stream. Multiple outputs of an AVB Talker cannot be routed to an individual loudspeaker.

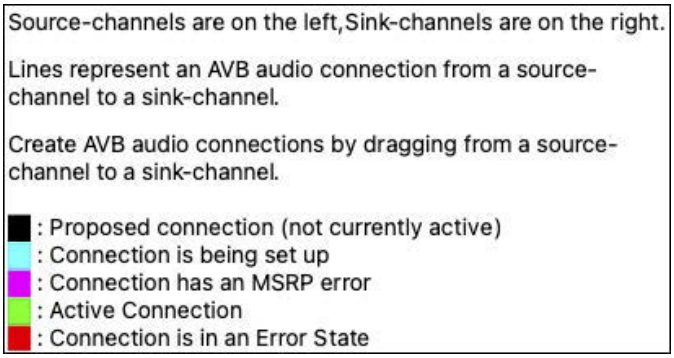
To disconnect specific AVB routing, select the entities from the Talker or Listener list and click the **Disconnect Selected Talkers (Sources)** *(2)* or **Disconnect Selected Listeners (Sinks)** *(3)* buttons below the lists.

To disconnect all AVB routing connections, click the **Disconnect All** *(4)* button at the top, center of the Loudspeaker Connection window.



AVB Connection Window, GALAXY Output Connected to Loudspeaker AVB Input

Hover the cursor in the space between the Talkers and Listeners to display the pop-up legend.

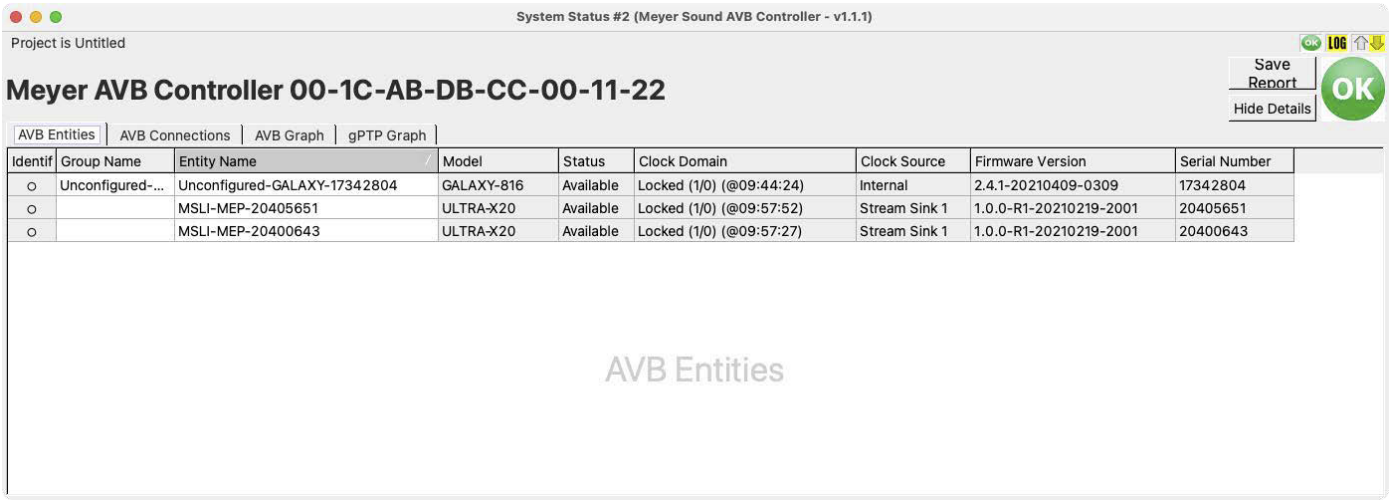


Pop-Up Legend

AVB CONTROLLER FUNCTIONS

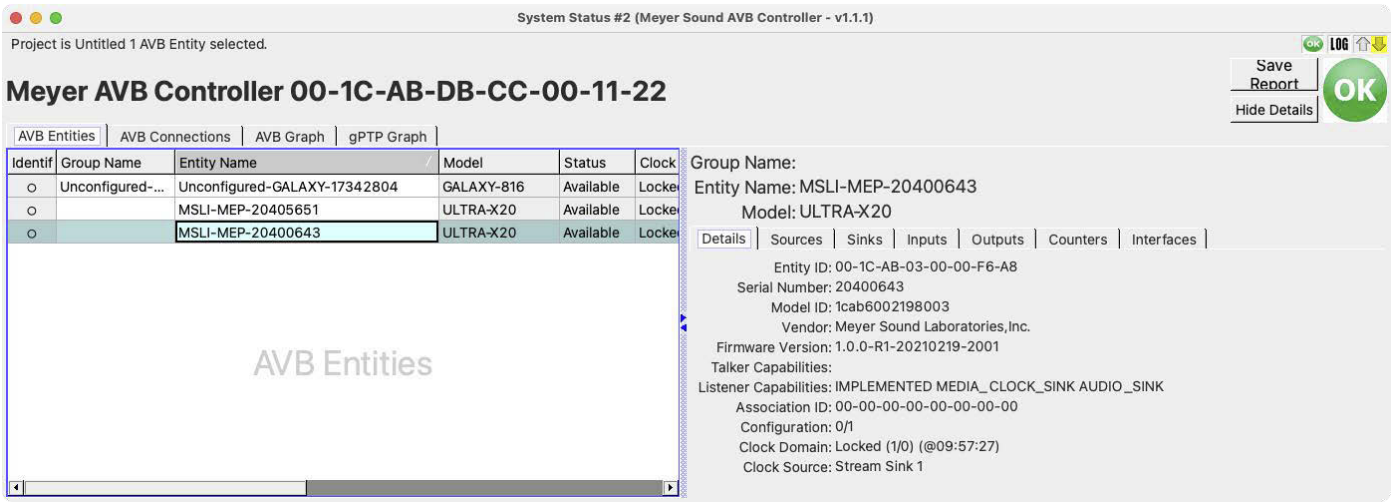
AVB Entities Tab

The AVB Entities tab lists all of the AVB entities on the network. Fields with a white background are editable. Double click to edit text.



AVB Controller, AVB Entity Tab

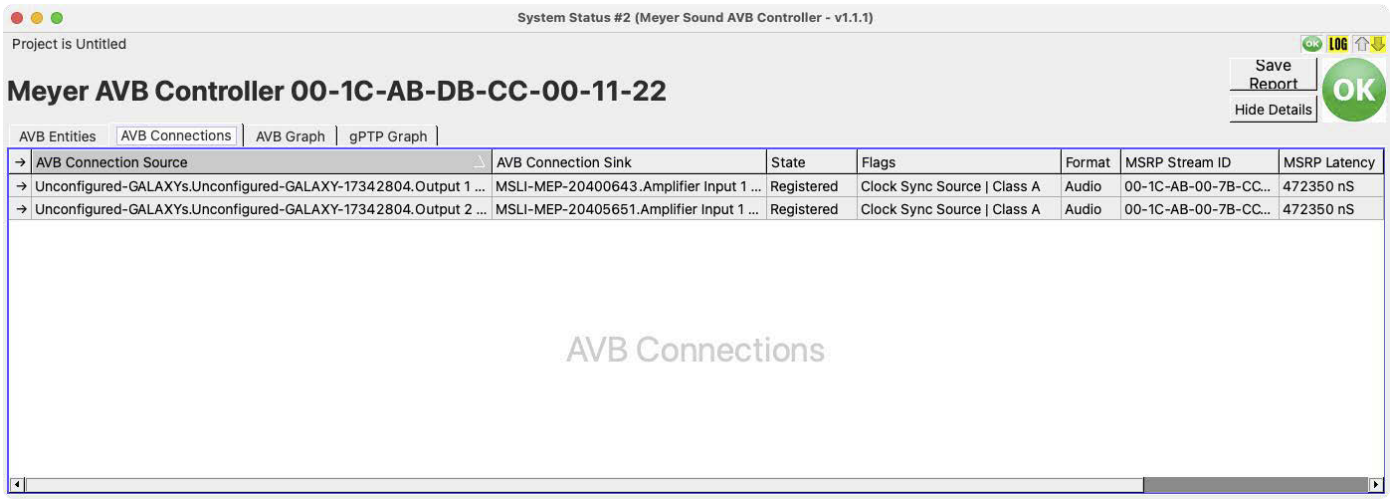
Select an Entity to split the window and reveal additional details.



AVB Controller, AVB Entities Tab, Expanded Details for ULTRA-X20.

AVB Connections Tab

The AVB Connections tab lists the Talkers (Sources) and Listeners (Sinks) that are connected, along with connection details. Right-click any column header for a contextual menu, including show/hide options for each column.

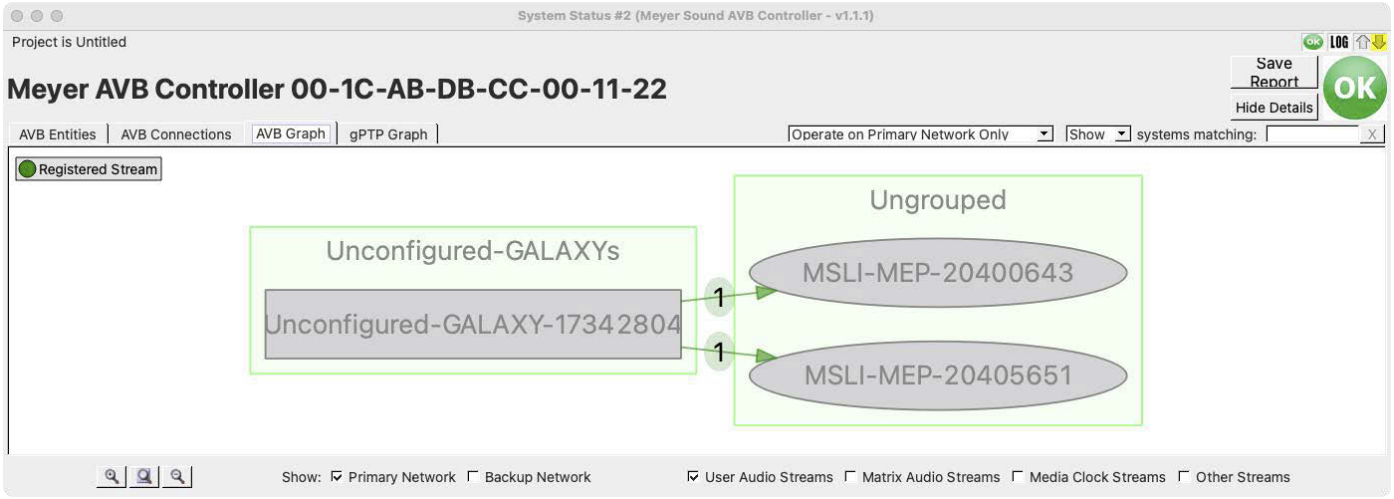


AVB Controller, AVB Connections Tab, Each AVB Connection and Details are Listed

AVB Graph Tab

The AVB Graph Tab displays a graphical illustration of AVB Entities and AVB Stream connections.

- Click-drag from one entity to another to establish an AVB connection.
- Hover the mouse pointer on an entity to highlight connections.
- Right-click to open a contextual menu.



AVB Graph Tab, AVB Entries and Connections

Select options at the bottom of the window to show/hide:

Primary Network connections. The numbers on the lines between entities display the number of channels that are "patched" for the connected stream(s).

Secondary Network adds a "/" followed by the number of secondary channels to the graphic representation of network connections (e.g., "8/8" is eight primary stream channels and eight secondary stream channels).

NOTE: Milan Endpoint Type 3M Audio Input modules do not accept a secondary network connection.

User Audio Streams are streams that a user has set up. For example, the connection from the GALAXY to the Milan Loudspeaker.

Matrix Audio Streams are the AVB streams that the GALAXY processors in Spacemap Mode have automatically set up between the GALAXY processors in the same system (processors that have the same Group Name).

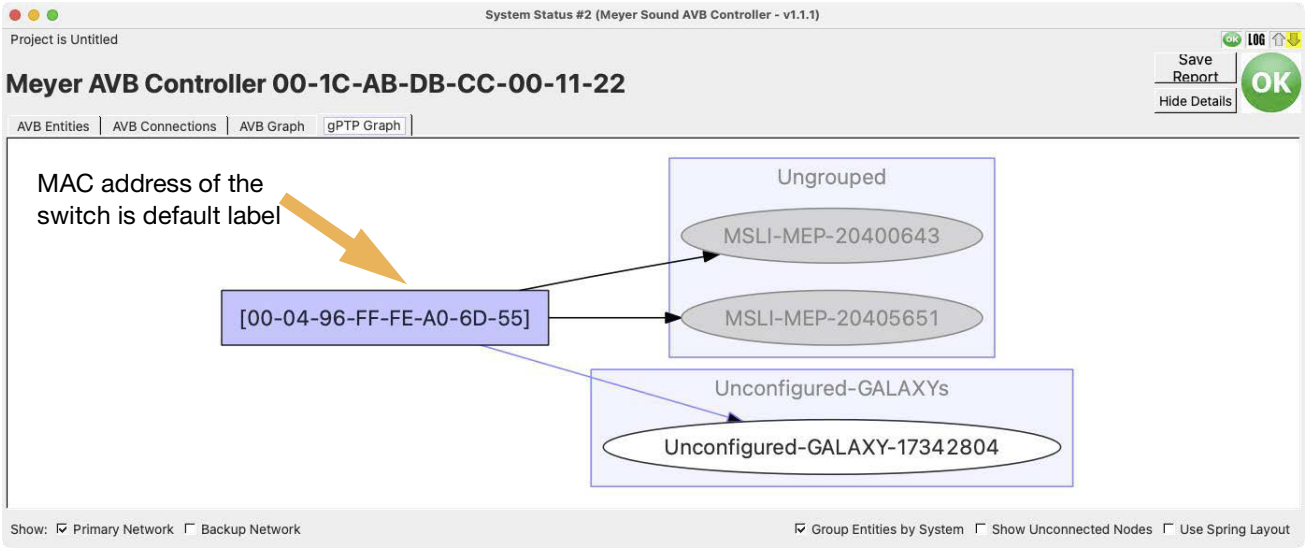
Media Clock Streams displays the path of the Media Clock streams, not to be confused with gPTP. Only one Media Clock Master is displayed. When there is more than one independent system running its own contained Media Clock, only one white box with "MC" is added to the entity that is the Media Clock Master. When there is more than one independent system on the network, a connection back to the entity marked MC is not displayed, indicating that the device hovered on is part of another, independent system.

Other Streams are AVB streams that are neither Audio Streams nor Media Clock streams (e.g., SMPTE or MIDI streams would be included in this category).

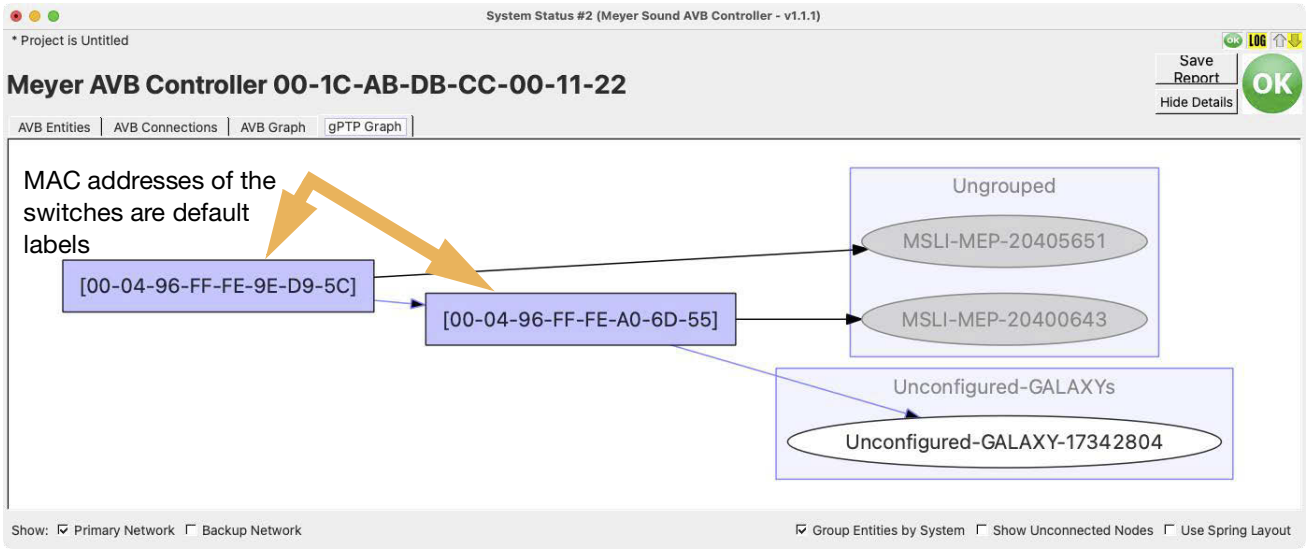
gPTP Graph Tab

This interface displays the gPTP path to all of the AVB entities and the connected network switches. Hover the cursor on an entity to highlight the gPTP path back to the gPTP Grand Master. When more than one network switch is used, depending on network connections, some gPTP packets may pass through only one switch, while others are routed through multiple switches. (See two example illustrations below.)

NOTE: gPTP is the generalized Precision Time Protocol as defined in IEEE 802.1AS. It is what forms the time domain that keeps everything in sync across the AVB network, including multiple Media Clocks.



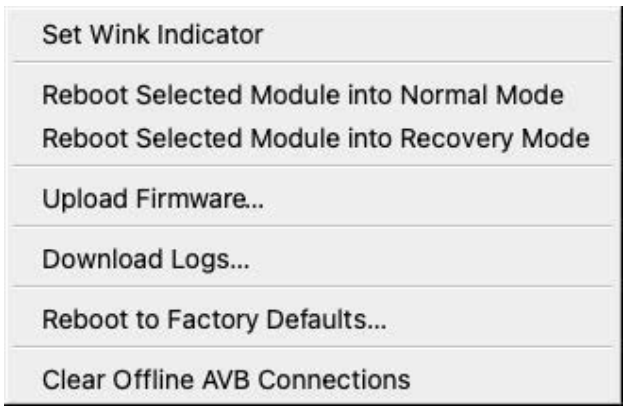
GALAXY, Two Milan Endpoint Input Modules, and Network Switch—AVB Controller, gPTP Tab, Display of gPTP Network Paths



GALAXY, Two Milan Endpoint Input Modules, Two Network Switches—AVB Controller, gPTP Tab, Display of gPTP Network Paths

Contextual Menus

Right-click on an AVB Entity Name in the AVB Entities (left) or AVB Graph tab (right) to open a contextual menu, offering these options:



AVB Controller, AVB Entities Tab (left) and AVB Graph Tab (Right), Contextual Menu Options for a Milan Input Module

Set Wink Indicator: When selected, the Wink LED-button on the loudspeaker is turned on. The Wink LED is toggled off by pressing the Wink LED-button on the loudspeaker, by selecting “Set Wink Indicator” again, or by clicking on the Green Dot that appears in the “Identify” column in the AVB Tab.

Reboot Modes: The Milan input module is booted to Normal Mode when operating the loudspeaker. The Boot to Recovery Mode is a special maintenance mode used by Meyer Sound Service technicians and when uploading **.endpointFirmware** files to an input module.

Reboot to Factory Defaults: Resets Entity and Group names, and all other parameters to factory defaults.

SAVE REPORT

The Save Report button (upper-right of the AVB Connection window) generates a text file with the information from the AVB Entities Tab and the contents of the Log. In the case of an issue, click the SAVE REPORT button in the upper-right of the AVB Controller and press enter to save the report in the default location:

Users/<username>/MeyerAVBController_Settings/AVB_Reports

or another location can be selected to save the file.

HELP!

Listed below is a short list of simple things to verify first.

1. Check the Audio Input Type 3M module on the rear of the loudspeaker and confirm the following:
   a. The **On/Status** LED is solid green.
   b. The **Wink** button, when pressed and released, toggles between dark and solid green. Note that when the **Wink** button is pressed and held, the **On/Status** LED will turn solid red. This is normal.
   c. The **Ethernet/Network**  LED is solid yellow.
2. Using the Meyer Sound AVB Controller, check the following:
   a. "AVB Entities" tab—verify there is an entry for the loudspeaker and that the Clock Domain is listed as "Locked."
   b. AVB Graph" tab—verify that you see a Registered Stream (solid green line) connecting an AVB Talker to the loudspeaker.
3. Using the Meyer Sound AVB Controller, click the "Save Report" button to capture information to help technical support if the problem persists. The report can be found in the AVB_Reports folder, which is inside the MeyerAVBController_Settings folder.

   NOTE: Is is a good idea to use the Save Report to document a working system. This provides documentation of the devices in use on the network, their serial numbers and firmware versions, as well as the settings in use during normal operation.

4. Confirm that the settings on the AVB Talker have the desired signal routed to the correct stream and output channel.

For more assistance with an issue, visit meyersound.com/contact. Under the Sales, Support, & Service Form heading, select the **Software Support** radio button, select **Compass Software** and **Bug Report** from the drop-down menus. Enter the information about the issue. Click the BROWSE… button to select and upload the AVB Report file.

COMMON QUESTIONS

Q: Can the Ethernet network be connected to the loudspeaker using a redundancy scheme?

A: There is only one Ethernet connection on each Type 3M input module, so redundancy schemes are not possible.

Q: Can the Ethernet network be "looped" from one loudspeaker to the next?

A: There is one network connection on the Type 3M input module; each loudspeaker with this module is connected directly to an AVB certified network switch. The same stream and channel can be routed to multiple AVB "listeners" on the network.

Q: Can a loudspeaker receive more than one AVB stream, more than one channel of a stream?

A: Milan endpoint input modules can subscribe to only one AVB stream and one channel at a time.

GLOSSARY

AVB Audio/Video Bridging, now often called AVB/TSN (Time Sensitive Networking) or just TSN. This set of IEEE standards specifies requirements for the transportation of media over the Ethernet in a way that provides low latency with deterministic delivery between devices.

AVB Stream A group of channels transmitted on an Ethernet network between a Talker (Source) and a Listener (Sink).

AVB Channel The container for an audio signal within a stream. AVB streams can carry hundreds of channels. Milan AVB defines required channel counts that must be supported for interoperability between Milan devices.

AVB Talker (Source) A device with hardware capable of transmitting (sending) audio over an Ethernet network using the AVB protocol. Conceptually, it is analogous to an analog output.

AVB Source Another name for an AVB Talker.

AVB Listener (Sink) A device capable of receiving packets that have been transmitted over an Ethernet network using the AVB protocol. Conceptually, it is analogous to an analog input.

AVB Sink Another name for an AVB Listener.

Milan AVB A selection of the AVB protocols, made for Pro Audio applications with focus on interoperability and reliability.

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