ClearOne®

APPLICATION TECH NOTE

PRODUCTS SUPPORTED:
All CONVERGE Pro 2 Products

CONVERGE PRO 2 SYSTEM
BASIC SETUP AND CONFIGURATION

OVERVIEW

This document provides guidelines for basic setup and configuration of a CONVERGE Pro 2 (CP2) system in the following three sections:

- Part I: Creating a Basic Project File
- Part II: Loading Your Project to Your Equipment
- Part III: Beamforming Mic Array 2 (BFM2) Connection Troubleshooting Guide

PART I: CREATING A BASIC PROJECT FILE

On a CP2 unit or stack of units, you must first create a project file in CONVERGE CONSOLE while offline. This section outlines how to create a basic project file.

Make sure you are running the latest version of the CONSOLE software. To verify the version you are currently running, click on the Help menu and select About. If you don't know what version is the latest version, click on the Help menu, and choose Check for Updates to see what version of CONSOLE is listed.
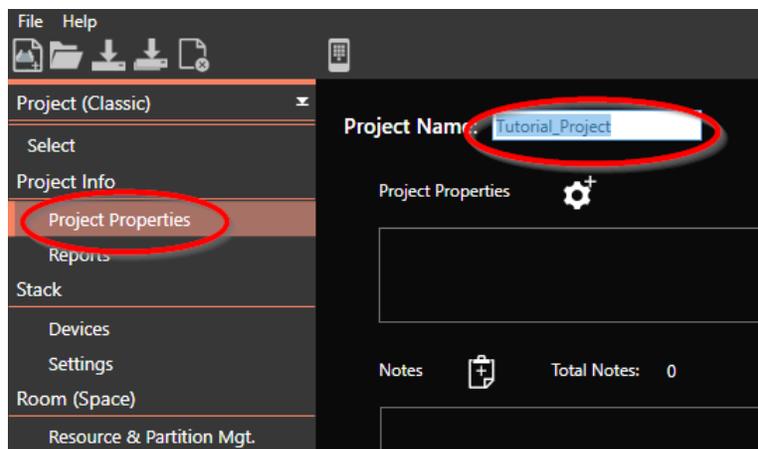
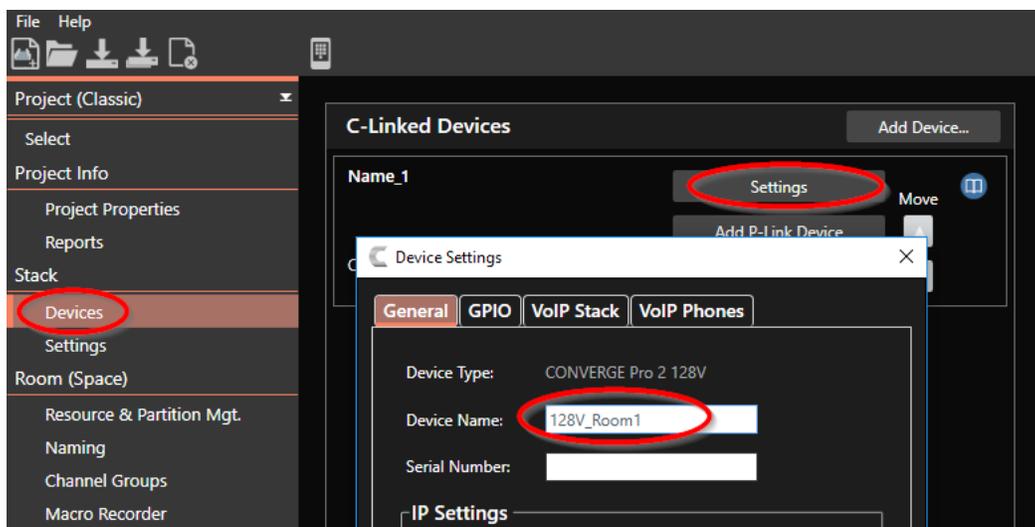1. Run CP2 CONSOLE. Under Select, click New.
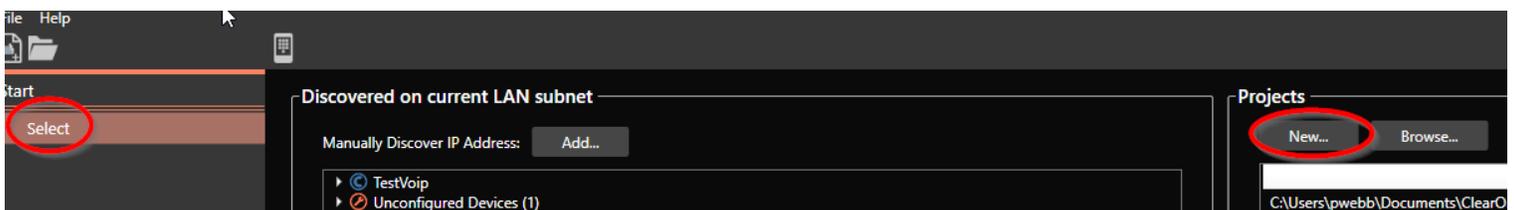
2. Add a device to the project. For this tutorial, we will add a single 128V.

    »   **NOTE:** You can also add multiple devices to the project at this time.
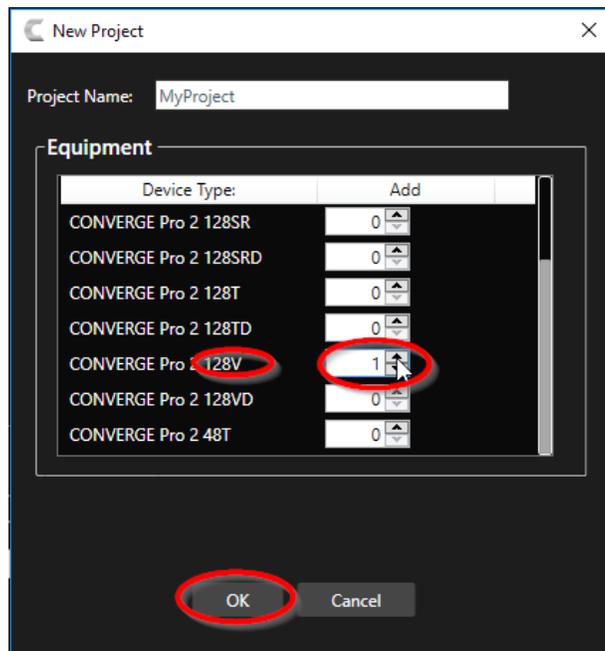
3. Under Project Properties, assign a project name. This is the name that identifies this stack of equipment under "Discovered on current LAN subnet" in CONSOLE.
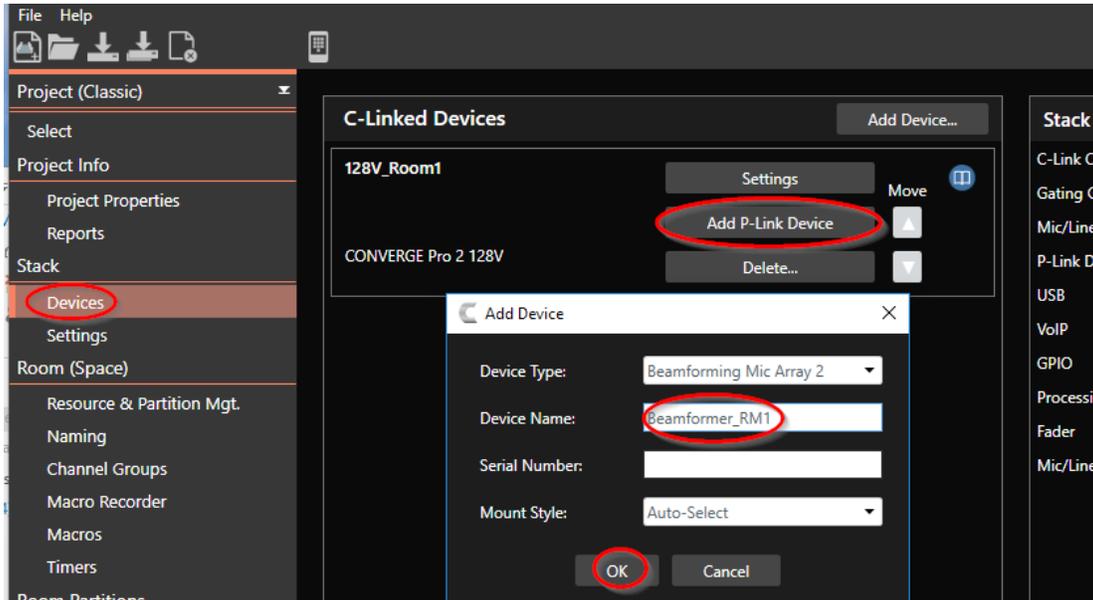

4. Under Stack, click Devices, and select Settings. Assign a name to the 128V under Device Name. This is the network name of the device.

5. We are including a Beamforming Microphone Array in this tutorial setup. Under Stack, click on Devices, and select Add a P-Link Device. Assign a name to this Beamforming Mic Array.

Our tutorial project does not yet contain any audio channels. Although the Beamforming Mic Array has been added, there still is no audio channel for this mic.

6. Under Room (Space), select Resource & Partition Mgt. This is where you add all the audio channels this project needs. We recommend adding only the channels you need. This keeps things simpler and helps to avoid unnecessary complexity.
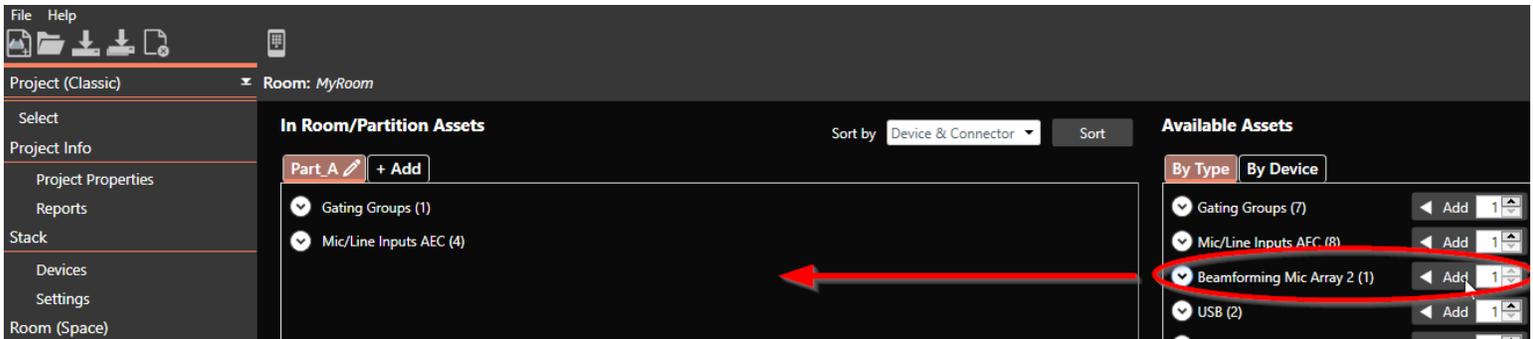
7. Add a gating group. Under Available Assets, select Gating Groups, and click Add. For mics to gate properly, it is necessary for multiple mics in the same room to be in the same gating group.
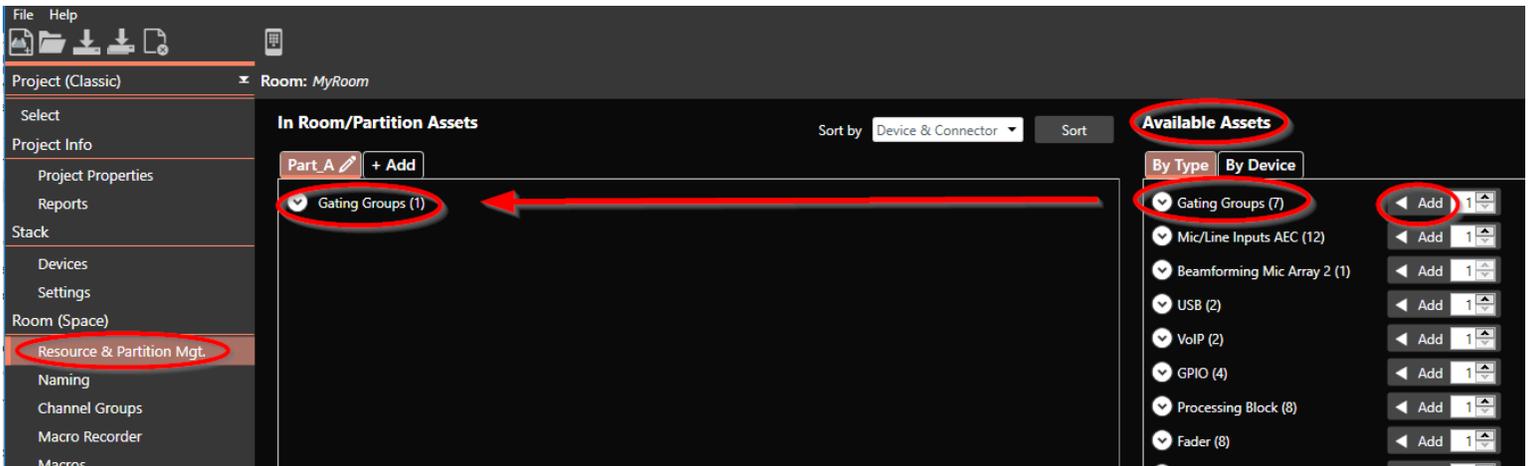
8. For this tutorial, we are adding four Mic/Line Inputs. These will be for a wired mic, a wireless mic, and program audio left and right.
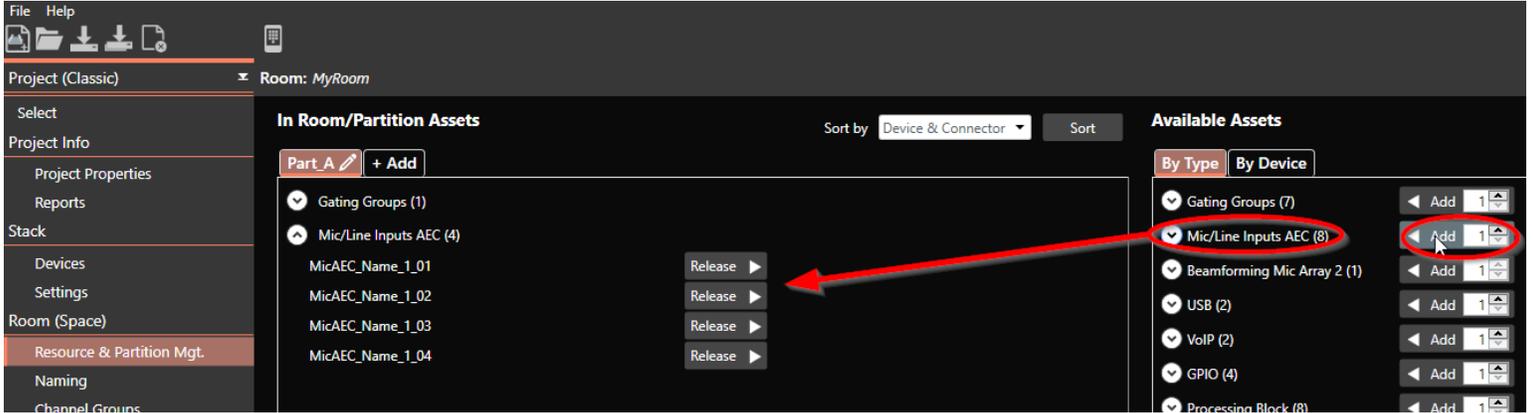
9. Add an input channel for the Beamforming Mic Array.

10. Add two USB channels for left and right PC audio.

11. Add a VOIP channel. As noted earlier, the VoIP interface must be configured under Device Settings.

If Processing Blocks and Faders are to be used, they must also be added here.

12. Add one line output. This output would be cabled to an external amplifier.

13. Add an AEC reference. Open up this output and click Add Standard to add a standard AEC reference to this output.


» **NOTE:** If a mic needs to have audio routed back into the room for local sound reinforcement, you will also need to add a custom reference for that mic or those mics. For further detail, see the technical App Note document "CONVERGE Pro 2 AEC references":

http://www.clearone.com/uploads/resource/CONVERGE_Pro_2_AEC_Referencing.pdf

» **NOTE:** You can now add **+ Add** a second room partition, and then add other channels to that partition. In a project with two room partitions, a GPIO pin can be added to the second partition for opening and closing the divider between the two partitions. If a GPIO Logic Input pin is to be used for opening and closing a room divider, this must be configured here.

14. Under Naming, assign names to your channels that reflect their respective purposes.

» **NOTE:** Names may contain only letters, numbers, underscores "_", or hyphens "-". A name cannot start with a number, and cannot contain spaces.
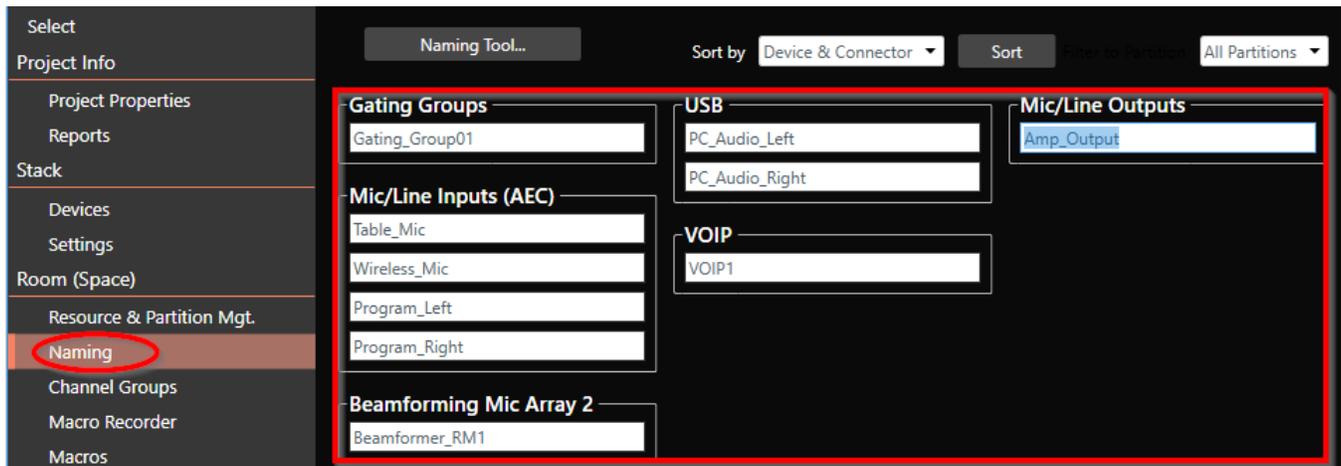

15. Under Room Partitions, click MatrixView. This is where you determine how input channels are routed to various output channels and busses.

For this tutorial we will simply route the mics to the PC and VoIP Tx, and the PC and VoIP Rx to the amp output.
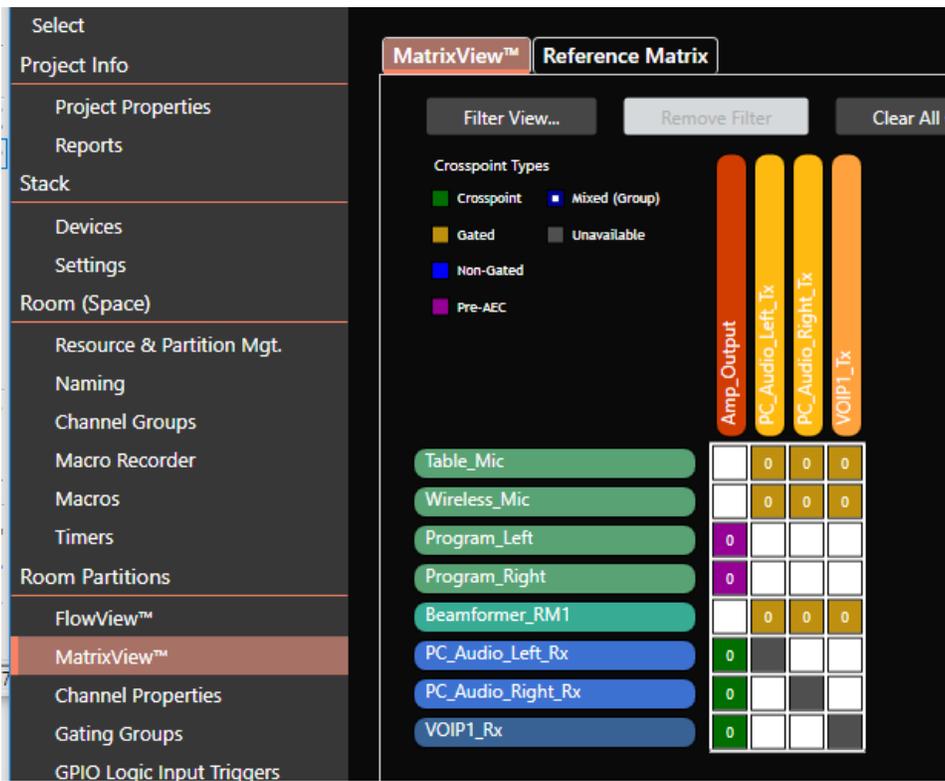
16. You must now configure the Reference Matrix so that the mic inputs will have Acoustic Echo Cancellation. While still in MatrixView, select the Reference Matrix. Add an arrow to the reference Matrix for each mic input. This tells each mic input to use this AEC reference.
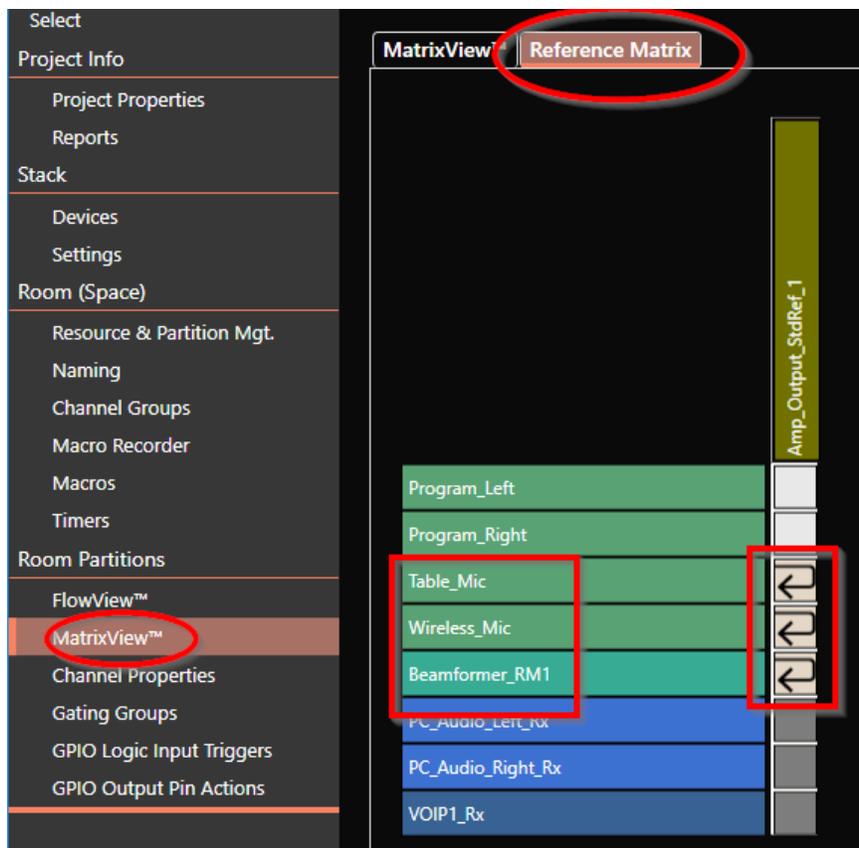
For further information see the technical App Note document "CONVERGE Pro 2 AEC references":

http://www.clearone.com/uploads/resource/CONVERGE_Pro_2_AEC_Referencing.pdf

17. Under Channel Properties, select Table_Mic. Since this is a wired mic, you must enable Phantom Power (PPWR).
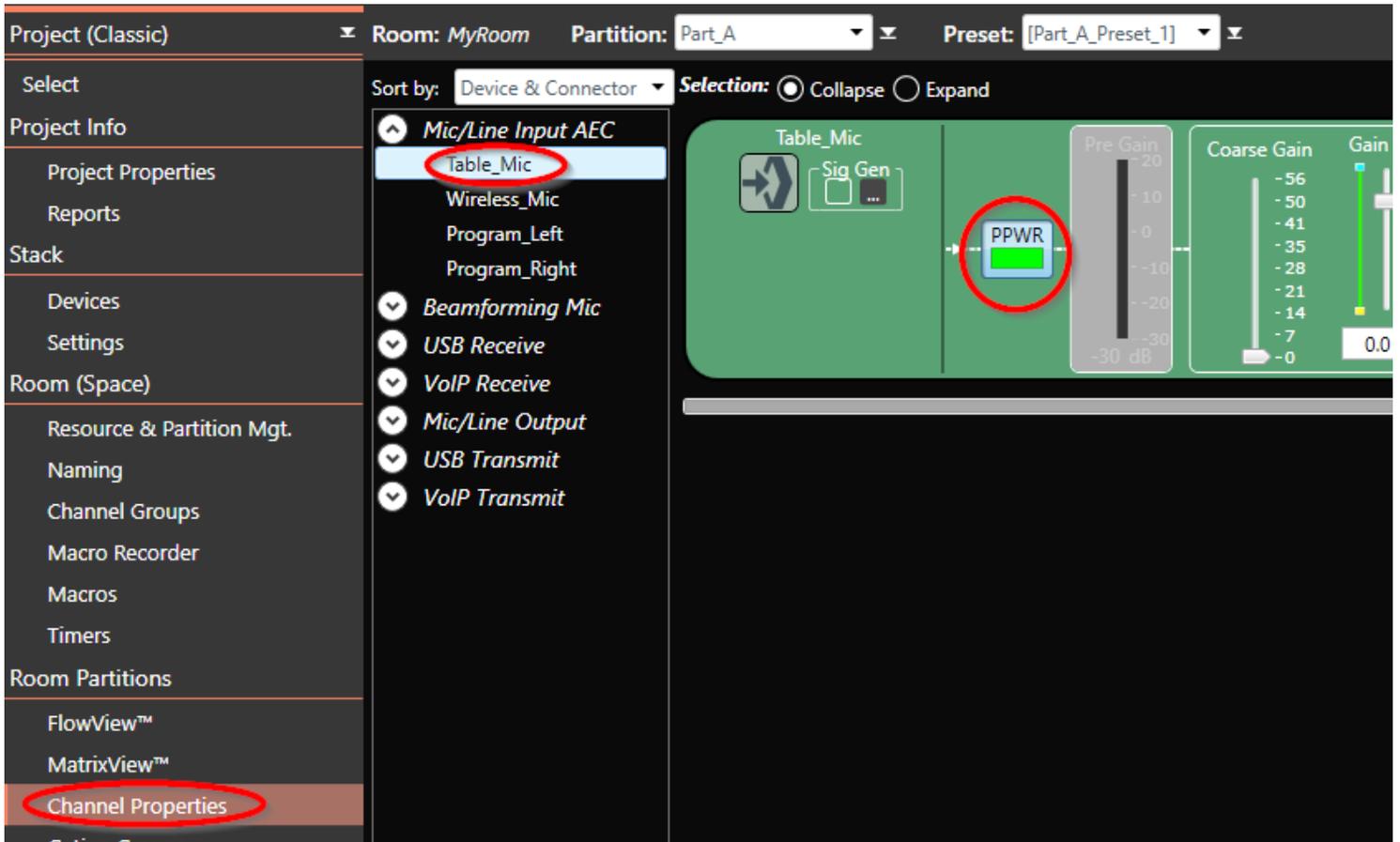
18. Still in Channel Properties, select Program_Left and Program_Right. Since these inputs are for line audio rather than mic audio, you must configure them as line inputs. To do this, right-click in the channel properties window for each of these inputs and select "Configure as Line Input."
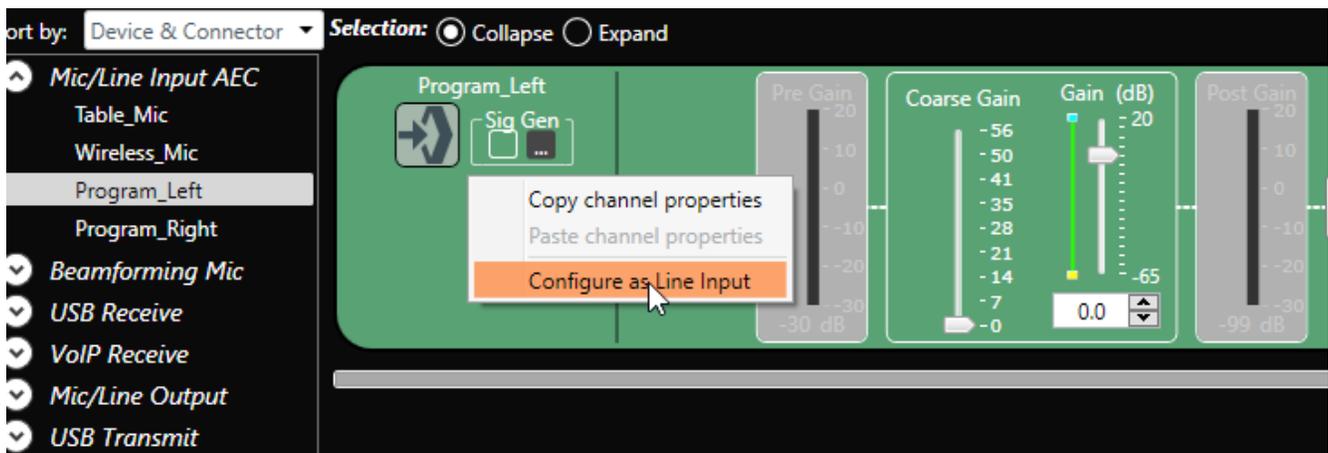
19. Go to Gating Groups. To add mics to your gating group click Add/Remove Mics. In the pop-up window, select our three mic inputs. Use Control-Click to select multiple mics.
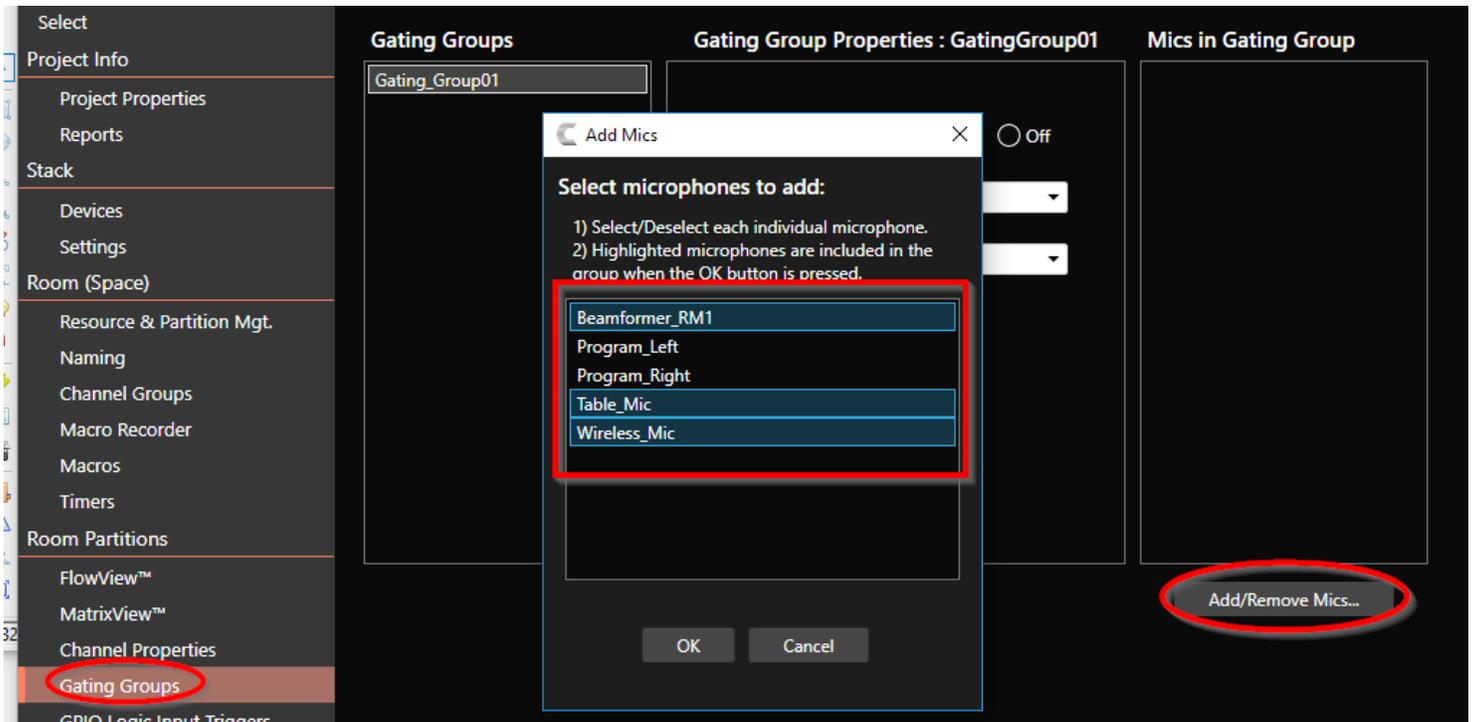
> » **NOTE:** If GPIO Logic Input pins have been added as a resource, and have not already been configured for room partitions/dividers, they can now be configured for other purposes under GPIO Logic Input Triggers. GPIO Output Pin Actions could also be configured now.
>
> » **NOTE:** Dante Audio Channels require special configuration and routing considerations that are outside the scope of this document.

20. Save this project file on your PC using the Save As icon , or by selecting Save As from the File menu.

## PART II: LOADING YOUR PROJECT TO YOUR EQUIPMENT

If you have a 128V and a Beamforming Mic Array, you can now load this project file to your equipment.

> » **NOTE:** If you do not have a 128V but do have a different CP2 unit, you can follow the steps above to create another project file for that unit. Under Step 2 above, select a different CP2 unit or units instead of the 128V.

1. Run CONSOLE. Verify that your hardware is on the latest firmware. Click Select and find your hardware under Discovered on Current LAN subnet. Click the small arrow to the left of your device to open up the details.
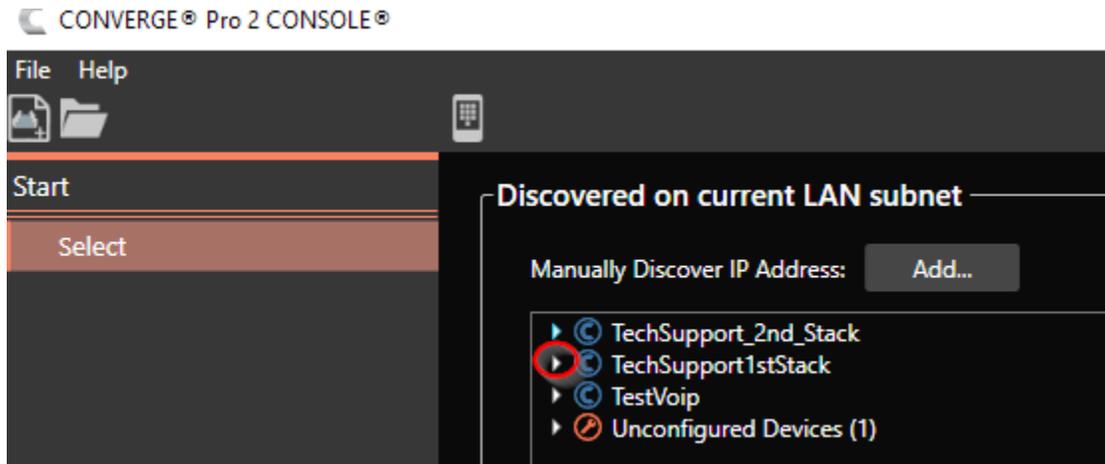
2. Find the current firmware version of your unit.
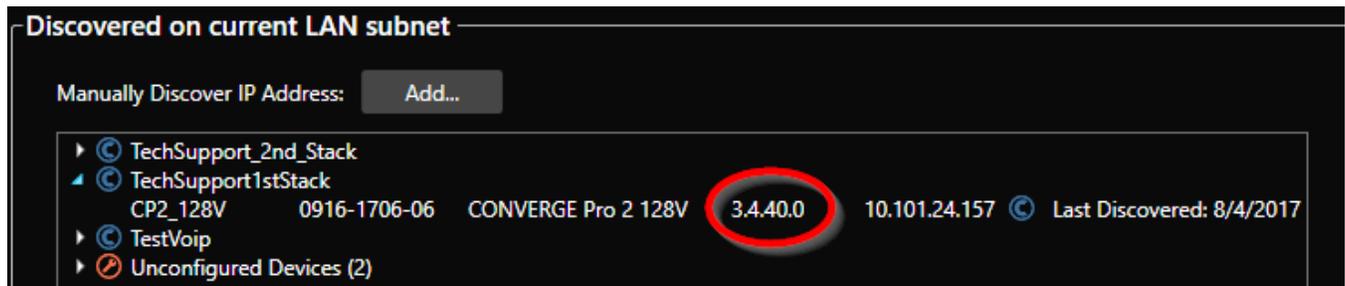
3. If you hardware does not have the latest firmware be sure to update to latest firmware before proceeding. If you don't know which firmware version is the latest, go to the Help menu and select Check for Updates.

> » **NOTE:** If your units have one of the earlier versions firmware, 2.x or below, ClearOne recommends that you Restore Factory Defaults before proceeding with the firmware update, even if you believe this unit is new out of the box.

After the firmware update, your hardware will restart. This restart may take some time.

4. Connect CONSOLE to your hardware. Under Discovered on Current LAN subnet, select your unit and click the Connect button.
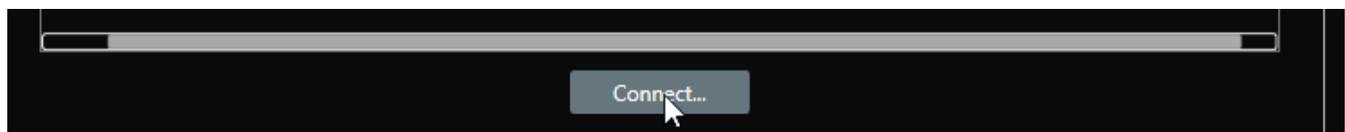
You will be prompted for a user name and password. The default user name and password are **clearone** and **converge**.

5. Under Project, select Load. Click Browse, browse to your project file, and load it.
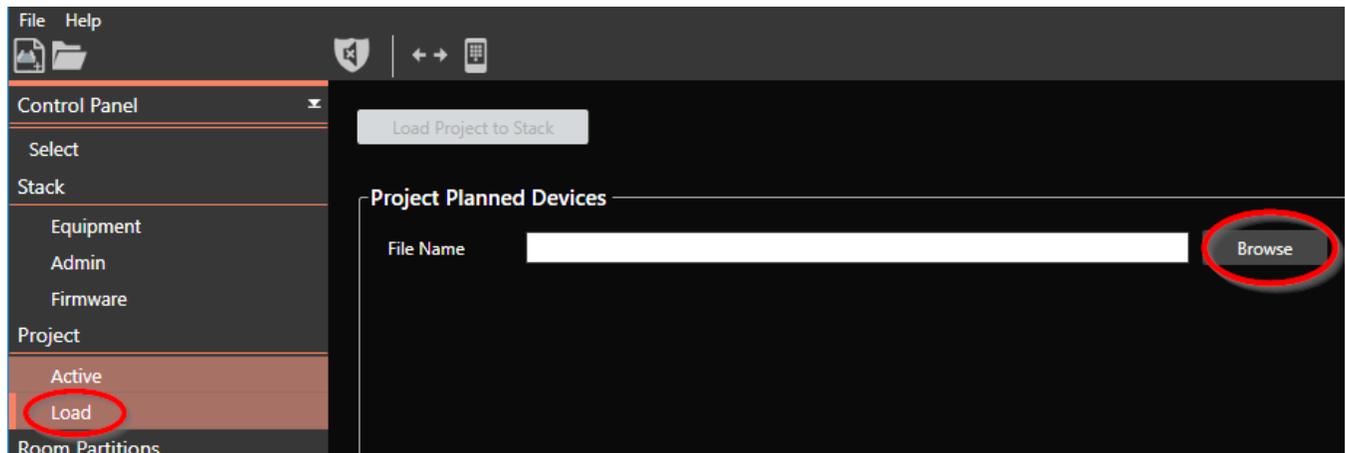

6. Now you must match up your physical hardware units with the hardware that is specified in the project file.

CONSOLE will find the serial numbers of the hardware units that are currently connected. Click the drop-down menu and select a serial number to match a physical hardware unit, listed under Connected Devices, to the hardware configured in the project file, listed under Project Planned Devices.

» **NOTE:** If you have a Beamforming Mic Array 2 (BFM2) connected, but it is not showing under Connected Devices, please see the Beamformer Connection Troubleshooting Guide below.
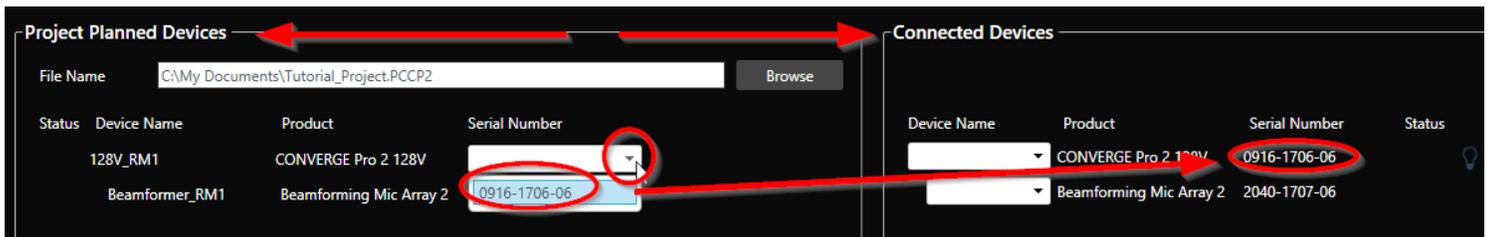
7. Once you have matched the serial numbers of the physical hardware to the hardware in the project file, everything will be green. Click Load Project to Stack.
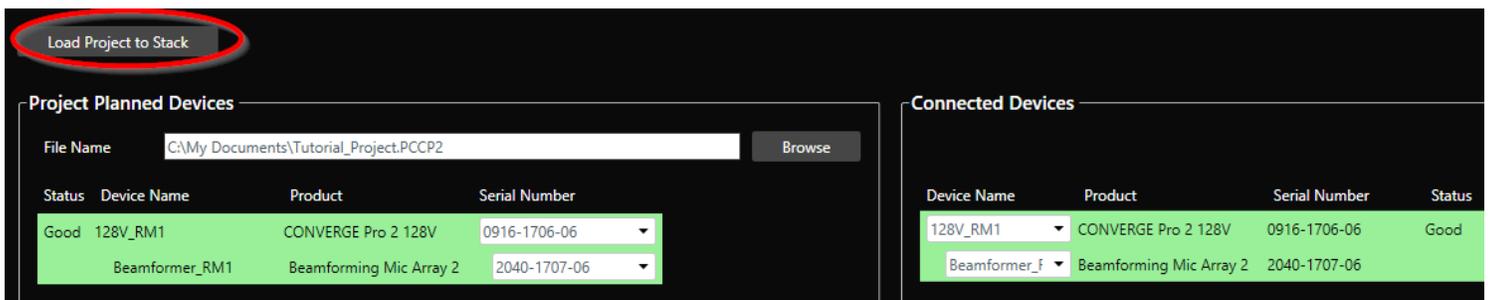
Once the project has finished loading to the stack, it is ready for testing.

» **NOTE:** During the testing phase, it is necessary to optimize the gain structure following ClearOne's guidelines. Correct gain structure is essential for achieving effective echo cancellation and other mic processing. Please refer to the Optimizing Gain Structure technical note document:

http://www.clearone.com/resources#professional_audio

## PART III: BFM2 CONNECTION TROUBLESHOOTING GUIDE

The BFM2 must be powered using a PoE injector. The ClearOne PoE injector for the BFM2, part number 910-3200-202, can power up to three BFM2s or other devices through the P-Link connection.

Connect the hardware as follows:

1. Connect the PoE injector to the P-Link PoE port on the back of the CP2 unit.
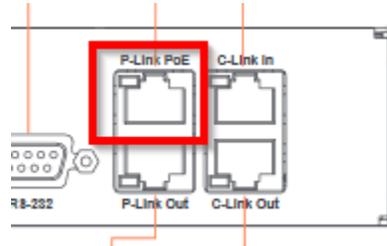
2. Connect a standard network cable to the P-Link Out port on the CP2 unit.
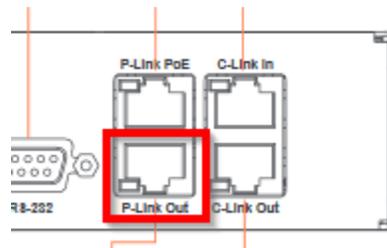
3. Connect the other end of this cable to the P-Link In port on the BFM2.

4. Ensure that the Power Selection Switch is switched to the P-Link position.

    » **NOTE:** It is also possible to connect the PoE injector directly to the PoE In port on the BFM2 as long as the Power Selector Switch is set for PoE. However, this requires two separate cable runs from the rack to the BFM2.

    » **NOTE:** Do not connect the PoE injector between the CP2 unit and the BFM2.

Third-party PoE injectors can, in some cases, be used to power the BFM2. However, they must meet the correct IEEE standards and use PoE Mode B. To power one BFM2, a PoE injector must meet the IEEE 802.3AF standard. To power up to three BFM2s, it must meet the IEEE 802.3AT standard for PoE-Plus. Note that the BFM2 only supports PoE Mode B. It does not support Mode A. Network switches cannot be used since they use Mode A. Some third-party PoE injectors also use Mode A, so these also cannot be used. For further information, see the PoE and CP2 P-Link Peripheral Products technical App Note in the Resource Library:

http://www.clearone.com/resources#professional_audio

You can also find the CONVERGE Pro 2 CONSOLE User Manual in the Resource Library for further CP2 setup and configuration details.