



Cisco Collaboration Devices with Sennheiser and Q-SYS

Setup guide

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Introduction

This setup guide has been developed by Sennheiser, Q-SYS and Cisco. The guide provides comprehensive instructions on how to setup a Sennheiser Ceiling Mic solution with Cisco collaboration devices using a Q-SYS Core Processor.

This document extends the instructions in the [Cisco Collaboration Devices – Audio Integration – Setup Guide](#) so that a fully working system is achieved.

All devices in the Cisco Board Pro, Desk, and Room Series support USB audio I/O. These collaboration devices are referred to as Cisco devices in the remainder of this paper.

For additional information please refer to the latest product documentation, FAQs, and user guides available on the Sennheiser, Q-SYS and Cisco websites.

Further reading

- [Cisco Collaboration Devices – Audio Integration – Setup Guide](#)
- [Cisco Project Workplace](#)
- [Maintain and Operate Guides for Room Series](#) (applies also to Desk and Board Series)
- [Device Configurations for Board, Desk, and Room Series](#)
- [USB microphone support for Desk and Room Series](#)
- [Cisco collaboration devices – Sound Quality blog \(<https://blog.webex.com/collaboration-devices/sound-quality/>\)](#)
- [Webex Certified Partner Ecosystem](#)
- [Configuration of Cisco CBS250, CBS350, and C1200 switches for use with Cisco video collaboration devices](#)
- [Sennheiser Control Cockpit](#)
- [Sennheiser TeamConnect Ceiling Solutions](#)
- [Sennheiser How to Guides](#)
- [Sennheiser Service & Support](#)
- [Sennheiser Room Planer](#)
- [Q-SYS Core Processor](#)
- [Q-SYS Designer Software](#)
- [Q-SYS Help File](#)
- [Q-SYS Knowledge Base](#)

Installation and configuration

Please refer to the [Cisco Collaboration Devices – Audio Integration – Setup Guide](#) on how to decide where to perform echo cancellation and how to set up the Cisco device accordingly.

Connectivity

Sennheiser, Q-SYS and Cisco have tested a typical setup, with a Cisco Codec Pro, a TeamConnect Ceiling 2 microphone, and a Q-SYS Core Nano.

The Sennheiser TeamConnect Ceiling 2 is an automatic beamforming microphone with an Ethernet port for PoE/Control and two Dante interfaces.

The Q-SYS Core Nano is an audio, video, and control processor.

For the physical setup, refer to the drawing on the following page.

We have tested with the following devices and firmware/software versions. Also the other Cisco devices mentioned in the Introduction support the feature.

Sennheiser	Firmware version
Sennheiser TeamConnect Ceiling 2	1.8.4
Q-SYS Core Nano	9.7.0

Cisco devices	Software
Codec Pro	RoomOS 11

Check for the latest Sennheiser and Q-SYS device firmware on

- www.sennheiser.com/control-cockpit-software
- <https://www.qsys.com/resources/software-and-firmware/q-sys-designer-software/>

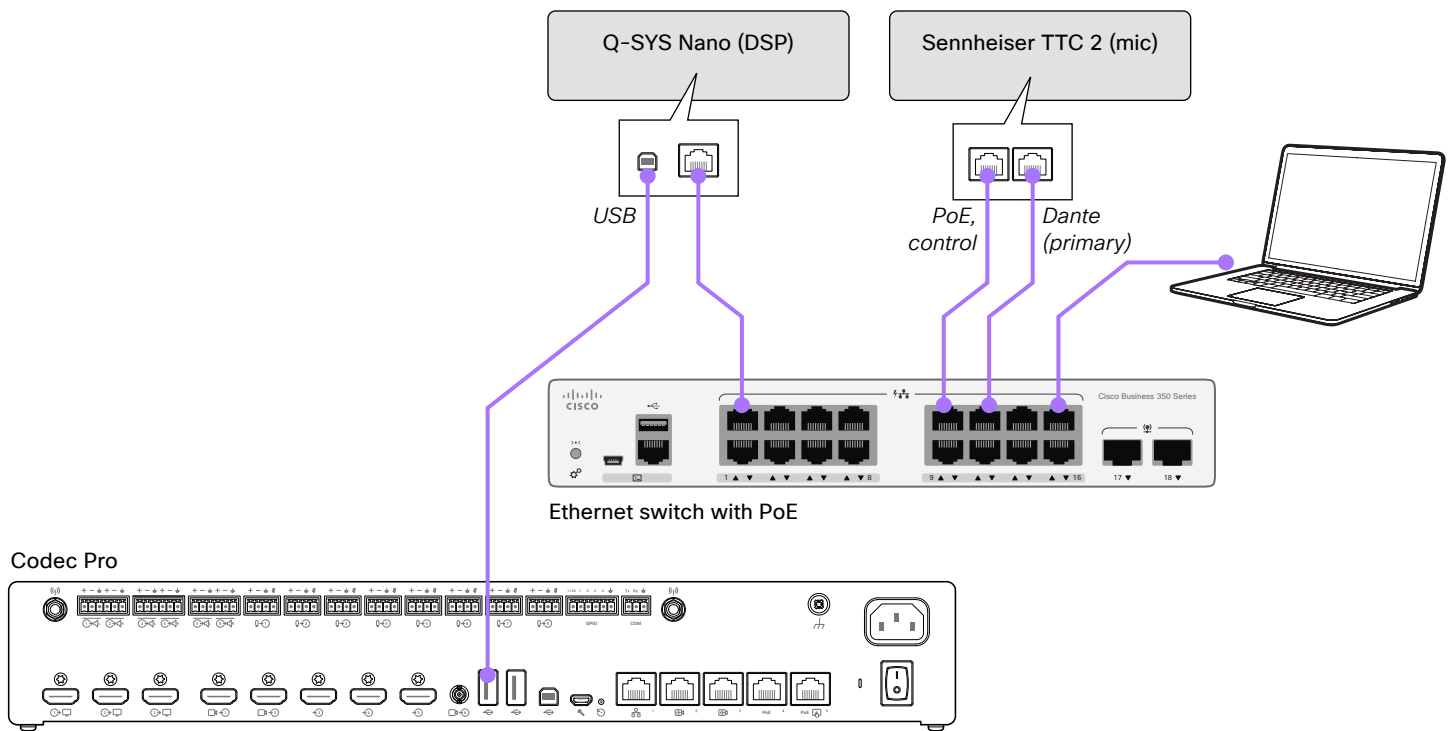


Figure 1: Physical setup illustration

In this configuration (Figure 1) both Sennheiser TCC 2 and Q-SYS Nano are connected to a PoE network switch. A laptop should also be connected to the same local network for initial configuration of both Sennheiser and Q-SYS devices. Audio routing is done in Q-SYS Designer software and Dante Controller.

You can either connect the Core Nano USB-B port to one of the Codec Pro USB-A ports, or the analog outputs of the Core Nano to microphone inputs on the Codec Pro. The latter is not covered in this technical paper.

Codec Pro is shown in the illustration, but a similar set-up also applies to the other Cisco products.

Configuration of Sennheiser TeamConnect Ceiling 2

The Sennheiser device (TCC 2) should be setup and configured in the normal way, following best practices and latest guidance from Sennheiser.

1. Connect the Sennheiser, Q-SYS and Cisco devices based on the schematics and use cases described earlier in this document (Figure 1).
2. For configuration of the Sennheiser Ceiling microphone, please open Sennheiser Control Cockpit. The Sennheiser device is delivered in a DHCP on mode, so it receives an IP address provided by the switch. While the TCC 2 is using mDNS it should show up under your device overview (Figure 2). In case not, please check your network or add the TCC 2 manually.

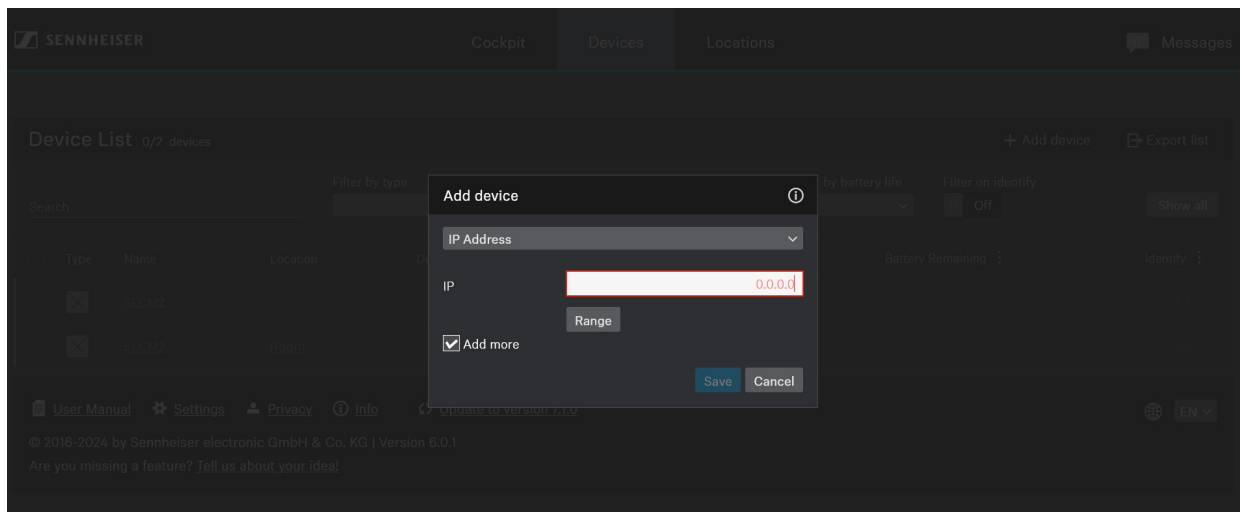


Figure 2: Add device

3. Click on the TCC 2 to access the different device setup pages (Figures 3 and 4).

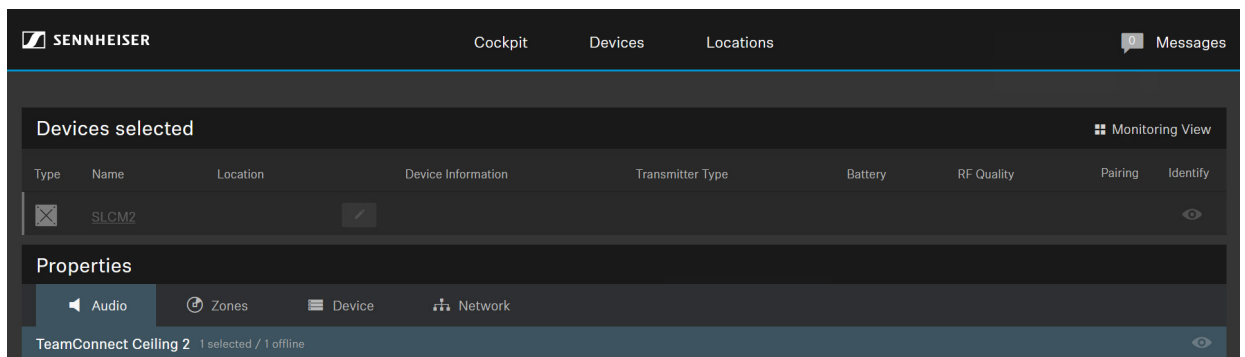


Figure 3: Device selection

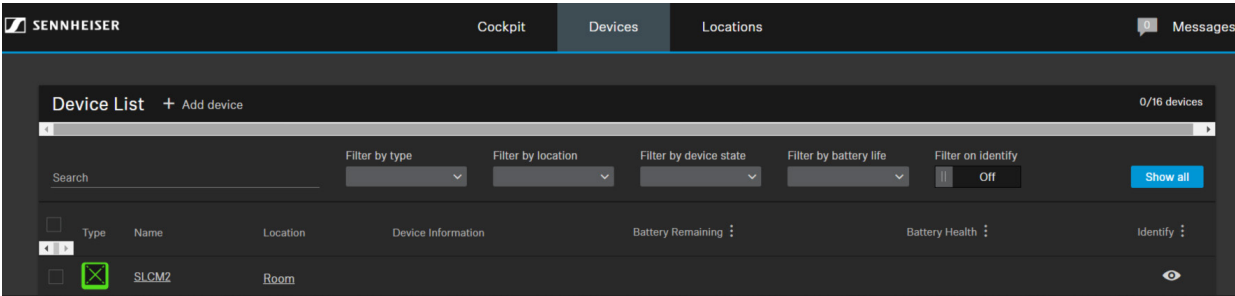


Figure 4: Device overview

4. Go to the specific tab for setting up Network, Zone or Audio settings if required (Figures 5, 6, and 7).

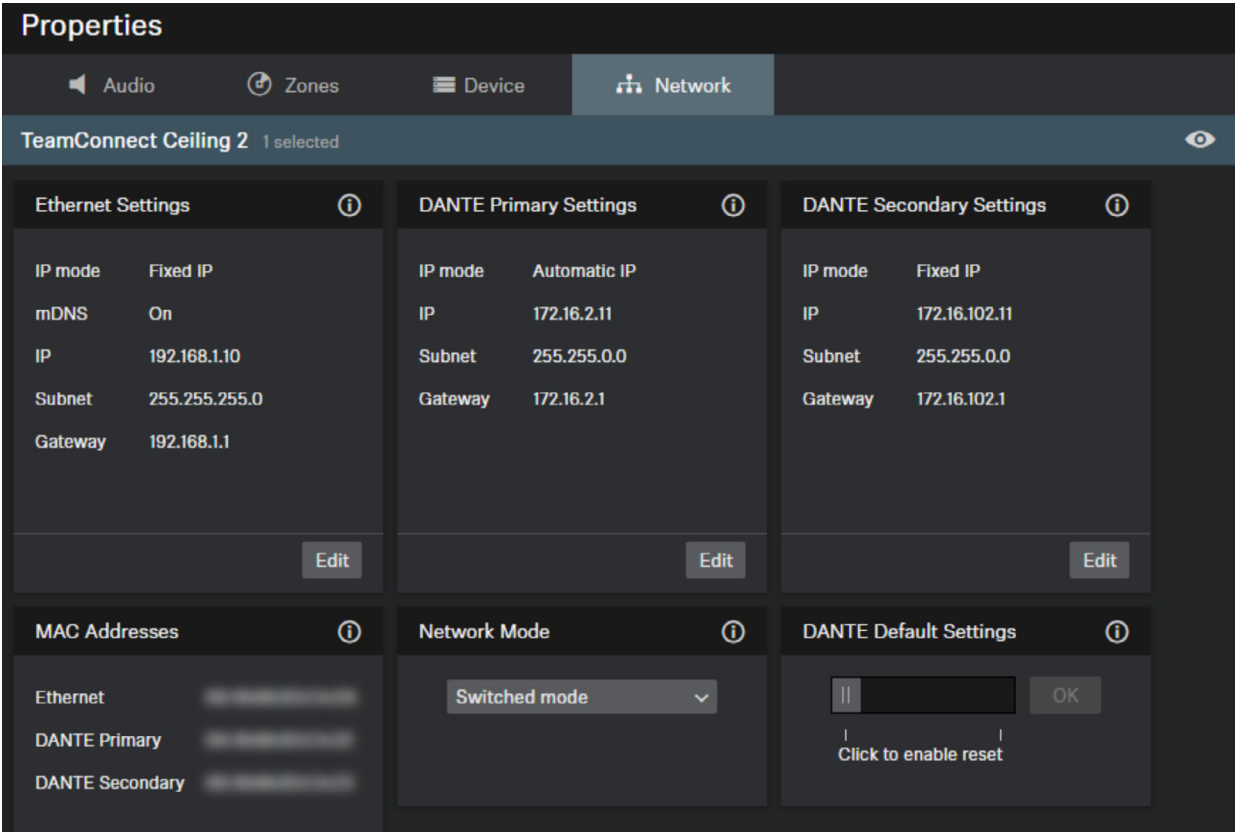


Figure 5: Network settings

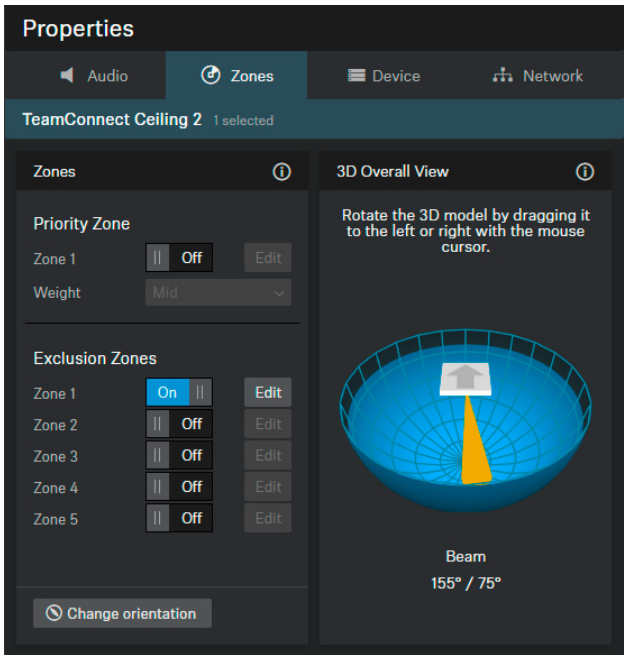


Figure 6: Zones settings

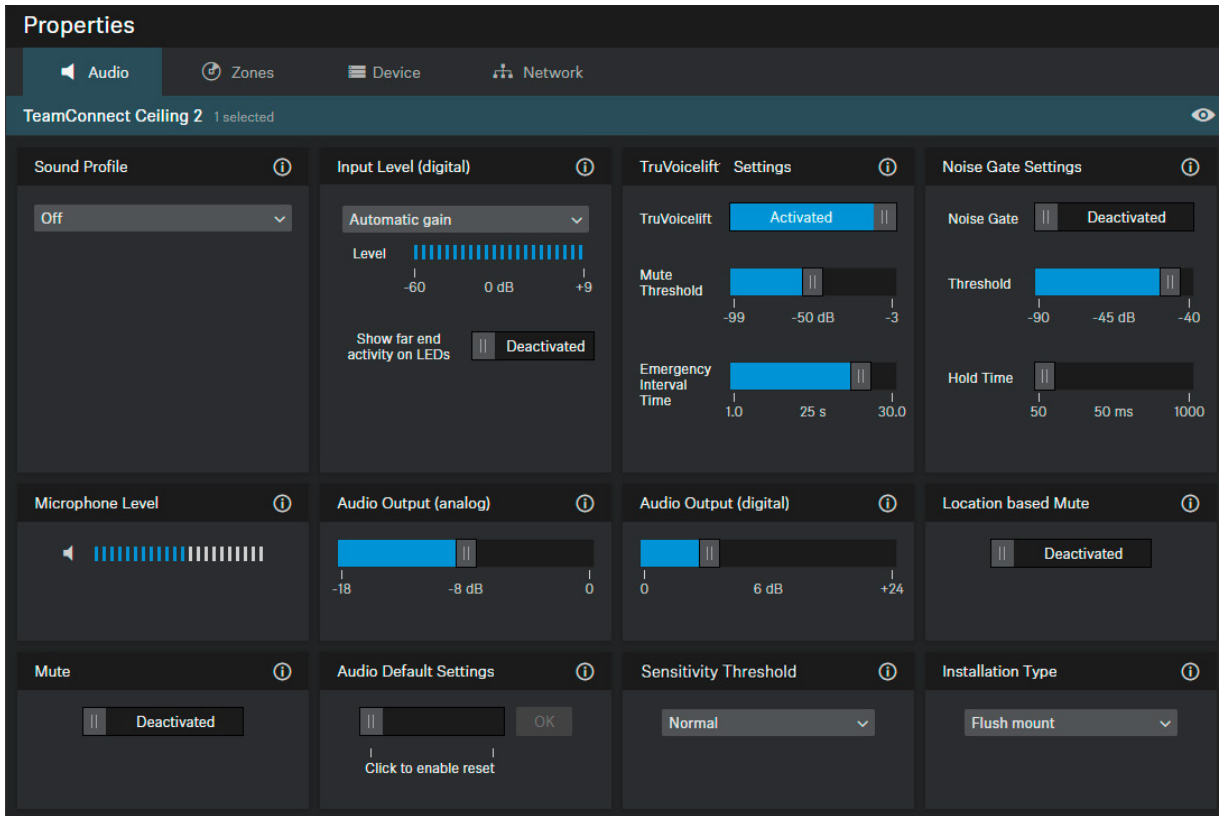


Figure 7: Audio properties

5. In case there is more than one Sennheiser device, please repeat the steps to configure.

Note that parameters for audio processing, such as AEC and EQ, can be adjusted. AEC and parametric EQ can be accessed via Q-SYS Designer. An EQ is also available if needed in the Codec Pro or in the TCC 2 via Sennheiser's Control Cockpit.

Configuration of Q-SYS Core Nano

1. Install the latest version of Q-SYS Designer Software. Go to Tools > Show Asset Manager and search for Cisco. Install the Cisco Collaboration Sample Design and then go to File > Open Sample Design and open the Cisco Collaboration Sample Design.

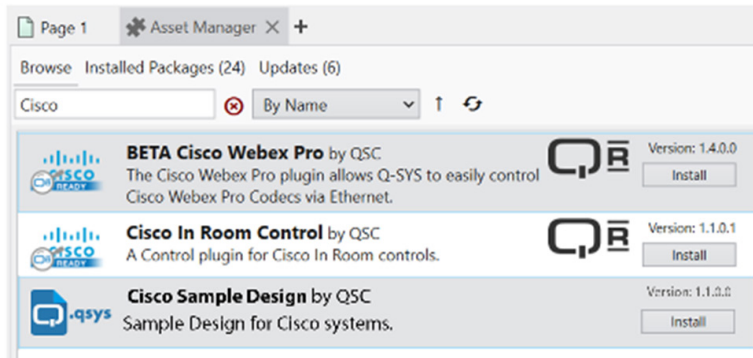


Figure 8: Install the Cisco Collaboration Sample Design

2. Once open, select Tools from the ribbon and select Show Configurator. This will open Q-SYS Configurator and you will see your Q-SYS Core processor listed on the left pane of the window. Choose your Q-SYS Core processor and click on the Configuration Page link to open Q-SYS Core Manager > [Network Settings](#).

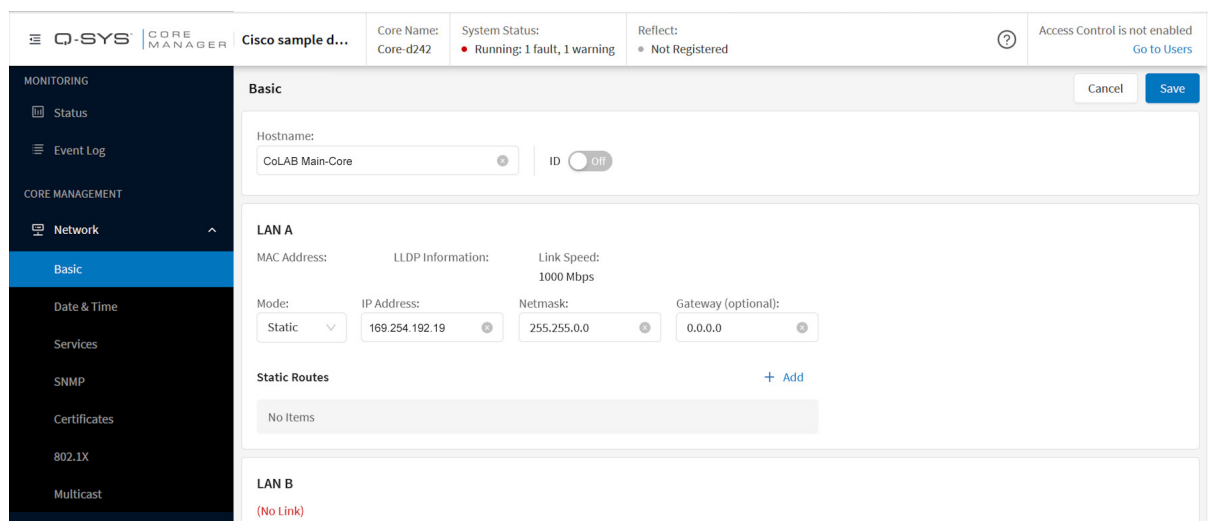


Figure 9: Q-SYS Core Manager network settings

3. Review/configure the Q-SYS Core's network settings. For more information, see [Initial Discovery and Configuration](#). Set the name of the Q-SYS Core to a unique name that suits your needs. Return to the design file and ensure that the Q-SYS Core's name in your design matches the Hostname you just set in [Q-SYS Core Manager](#). Save the design to the Q-SYS Core and Run (F5). See [About Designs on the Core](#).

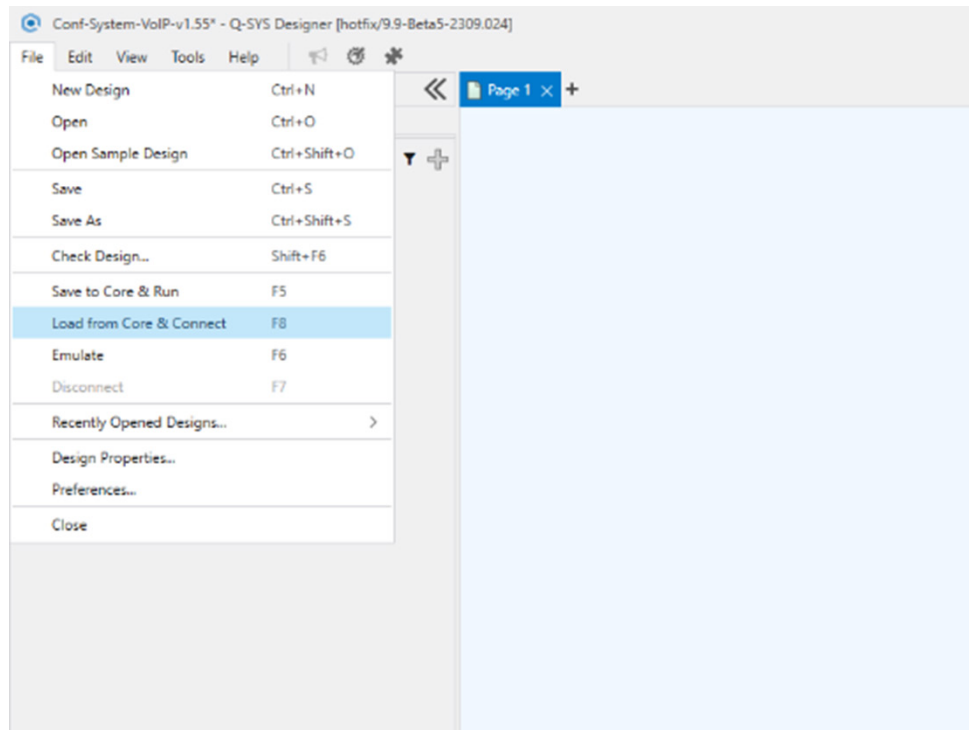


Figure 10: Save your design and run it

4. If the Q-SYS Core's firmware does not match that of Q-SYS Designer on your configuration laptop, you will be prompted to update the firmware. Refer to [Updating Q-SYS Software and Firmware](#).

5. The Cisco Collaboration Sample Design must be used as part of this setup. The Cisco Collaboration Sample Design can be found in Q-SYS Asset Manager and offers a step-by-step guide on how to properly connect Q-SYS with Cisco Collaboration devices. It includes Cisco and Q-SYS best practices for audio signal flow with Cisco Collaboration devices. It also includes a companion application UCI, which takes you through commissioning your Cisco Collaboration system, step-by step. Ensure that your mobile device is connected to the same network as the Q-SYS Core and use the QR Code in the Sample Design to launch the app.
6. When using the Cisco Collaboration Sample Design, AEC is performed in the Core Nano (Figure 11), instead of the Cisco device. Please refer to more information how to avoid double-processing in [“Performing echo canceling in the Q-SYS peripherals or Cisco device”](#) on page 15 of this document.

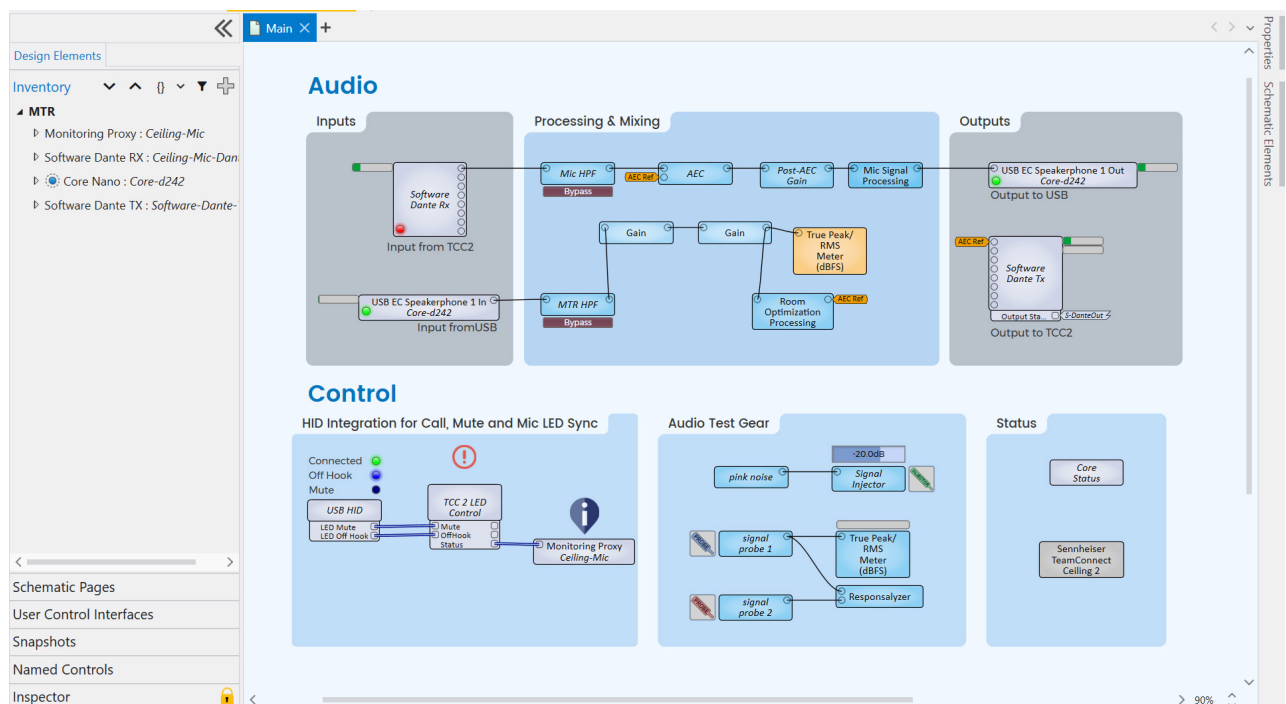


Figure 11: Cisco Sample Design audio routing and processing

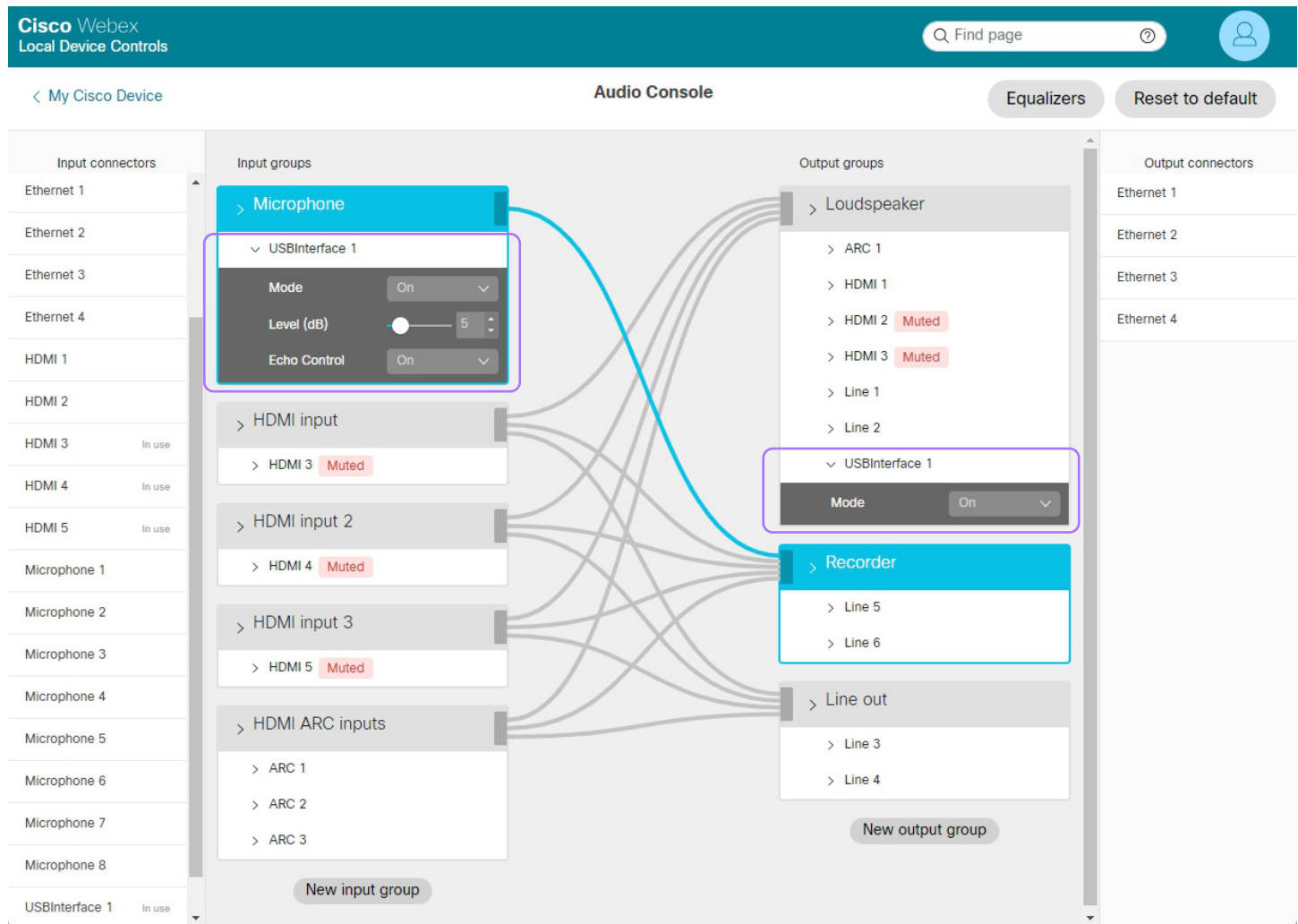


Figure 12: Audio Console in the Codec Pro web interface

On the Codec Pro side, make sure the input and output groups in Audio Console are setup correctly (Figure 12). When using the USB port in the codec, the “USB Interface 1” connector should be both in the Microphone and Loudspeaker groups to receive the microphone signal and send the AEC reference, respectively.

Note that for other devices like the Cisco Codec EQ and Room Bar Pro, an AV integrator option key is needed to access Audio Console.

Configuration of the Sennheiser TeamConnect Ceiling 2 without a Q-SYS Core Nano

We recommend including the Q-SYS Core Nano in the setup, but it is possible to connect the TCC 2 microphone using only an AVIO Dante to USB adapter.

When not including the Core Nano in the setup, you won't get mute synchronization. This configuration is not documented further in this technical paper.

Performing echo canceling in the Q-SYS peripherals or Cisco device

For considerations to place echo canceling processing either in the Q-SYS Core Nano or the Cisco device, please see the [Cisco Collaboration Devices – Audio Integration – Setup Guide](#).

We strongly recommend you only activate echo canceling in one device, that is only in the Cisco device or only in the peripherals. Doing it in two places may cause artifacts and quality reduction.

Currently, the Sennheiser TCC 2 and Q-SYS Core Nano only accept one AEC reference. Sound playback with dynamic multichannel mixing will suffer from degraded AEC performance when using a single reference channel. Therefore, echo canceling in the Cisco device should be considered in that case.

Network security considerations

To strengthen the protection of media and other networking services, precautions must be taken to minimize these risks.

We recommend precautions such as isolation of the networked audio components from the corporate network and enabling encryption and authentication.

Keep software and firmware of all devices up to date to benefit from functional and security related fixes and improvements.

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