

▶ Ten Steps to a Successful Design and Installation of SoundStructure Products

Designing and Uploading projects to SoundStructure Systems

Step 1 – Design the system

Create a SoundStructure project using the SoundStructure Studio software. The latest SoundStructure Studio software may be found on www.polycom.com. Follow the four steps to create project and at step 4 work offline and then save the project to disk. Refer to the online tutorial training streams for an example of creating a SoundStructure project file. Training streams are available on: http://www.polycom.com/support/voice/soundstructure/soundstructure_training.html

Step 2 – Wiring the system

If there are multiple SoundStructure devices to be used in the design, each SoundStructure device must have firmware version 1.2.0 or higher. See the SoundStructure Design Guide for information on updating firmware. Once devices have been updated to the latest firmware, power down the devices, insert any telephony cards that are required by the project – check the wiring page for which devices should have telephony cards. Finally OBAM link the devices in the order the devices are shown in the Wiring page. Connect the OBAM out port of the first device to the OBAM in port on the next device and continue for up to 8 devices.

Physically wire the analog inputs and outputs to the SoundStructure devices as defined on the wiring page as shown in Figure 2. Expand the inputs/outputs to see where inputs and outputs should be connected. It is important for the physical wiring to match the wiring defined in the Wiring page. If the system has already been wired, move the channels on the wiring page to match the physical wiring. Save the project file if any changes have been made to the wiring page.

See the SoundStructure Design Guide or SoundStructure and HDX Microphones Best Practices guide for information on connecting Polycom HDX video codecs and HDX microphones to SoundStructure devices.

Step 3 – Apply power

Apply power to the SoundStructure devices. If the front panel LED's on the devices turns yellow once the devices have finished booting, do not be concerned – this simply means that the equipment expected by the projects already in the individual SoundStructure devices does not match the actual SoundStructure devices linked together via OBAM. This mismatch will be remedied in Step 4 when a compatible project is uploaded.

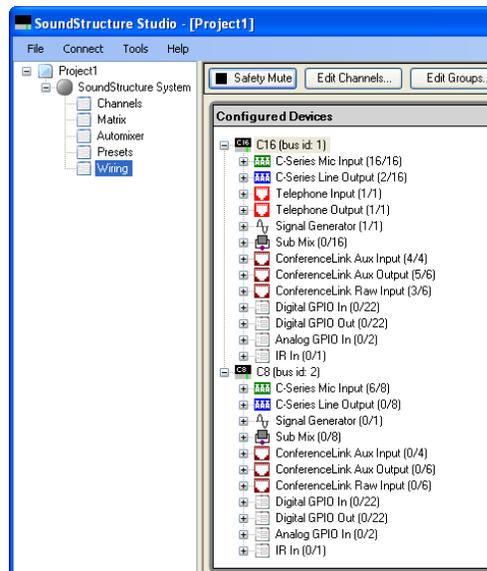


Figure 1. OBAM the system in the order shown on the wiring page.

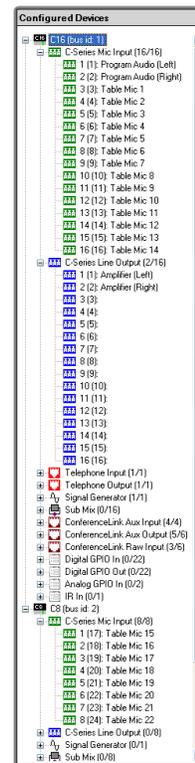


Figure 2. Expand the inputs and outputs to see how the system should be wired.

Step 4 – Upload the Project

Upload the SoundStructure Studio project created in Step 1. With the configuration file open within SoundStructure Studio, select Search for Devices from the Connect menu. If using serial port COM1, enable the Serial checkbox and select COM1 from the Serial selection. If using Ethernet to connect to the SoundStructure system, any devices on the same subnet as the PC running SoundStructure Studio will be automatically discovered. Select the SoundStructure system and select “Send configuration to devices” to begin the upload process. SoundStructure devices are expecting to receive an IP address from a DHCP server, if there is no server, a static IP address must be set to communicate over Ethernet.

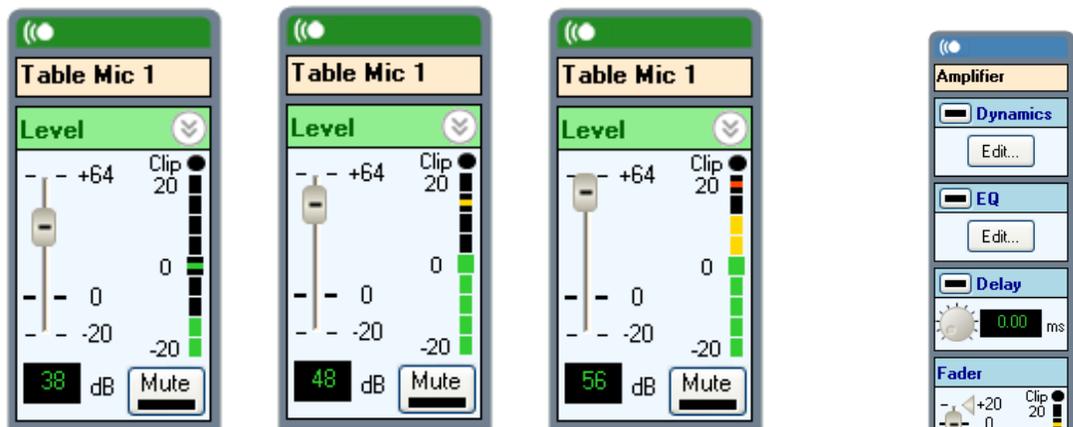
Validation and Final Adjustment

Step 5 – Input Calibration

Navigate to the Channels page to review, and adjust if necessary, the input signal levels (microphone inputs, telephone interface, video codec audio, and program audio). Proper input gains will show a solid green LED at the 0dB level and a peak smaller yellow level above that during normal speech/audio levels. Too few LED's and the input level should be increased, and too many LED's consistently means the input level should be reduced as summarized in Figure 3. The input level adjustment is the slider adjacent to the signal level.

Figure 3.

Examples of input levels that are too low (left), just right (center), and too high (right) during normal speech.



Step 6 – Output Calibration

Review and adjust, if necessary, the output level (amplifiers, video codec, and telephony interface). For analog output signals there are two output gain adjustments – a fader (used for temporary volume adjustments) and an output level (used for equipment calibration). Adjust the output level to -10 (as shown in Figure 4) if that SoundStructure output is connected to a consumer device (typically with an RCA-style connector on the consumer device) to prevent overdriving the input of the consumer device. Adjust the output level to 0dB if connecting to a professional device (XLR or phoenix connectors). Play audio (the signal generator, program audio, telephony, or codec audio) into the room to make sure amplifiers and loudspeakers are connected and the amplifier level is appropriate. See the SoundStructure Design Guide for additional information concerning setting amplifier levels.

Figure 4. Setting the output level.

Step 7 – AEC Settings

On the Channels page, expand the AEC block and ensure that the AEC reference for each microphone contains only remote audio and that no microphones are in their own reference. Use submixes if necessary to create a reference that only contains the remote audio sources. Any output or submix may be selected as an AEC reference signal.

While in an active call, check the room gain on each microphone by watching the room gain meter on each microphone while receiving audio from the remote site –only the receive (Recv) LED should be lit within the AEC block – this means that the local participants should not be talking during this phase. If the room gain is above +5dB as shown in Figure 5 (right), adjust the volume knob lower on the audio amplifier, increase remote input levels such as telephone and video codec, and then check the room gain again. The goal is to have the room gain 0dB or less for every microphone. Due to their proximity to loudspeakers, ceiling microphones typically will have a higher room gain than table microphones. To make it easy to have a remote talker, a recording may be heard by dialing the PSTN phone number +770 350 4120.

Step 8 – Volume Control

Check that the control system in room volume adjustment is either changing fader of inputs (telephone input fader, video codec input fader, etc) or is changing the output fader to the amplifier (or a submix that feeds to the amplifier) and that channel is also being used as the echo canceller reference in order to keep the room gain constant. For information on configuring a sound reinforcement application, refer to the online training stream for how to set the echo canceller references and perform volume control.

Step 9 – Testing

Test the system with either a telephone and/or a video call to ensure all microphones can be heard as a local talker speaks while moving around the room and that the remote talkers are heard throughout the room. Adjust the in-room volume to the maximum user setting and do a final test of the room gain to ensure the system is robust even at maximum volume level.

Step 10 – Final Adjustments

Make any final adjustments, such as adjusting the equalization for the amplifier outputs, or creating partial or full presets, and save the final settings to a preset and then save the project to disk.

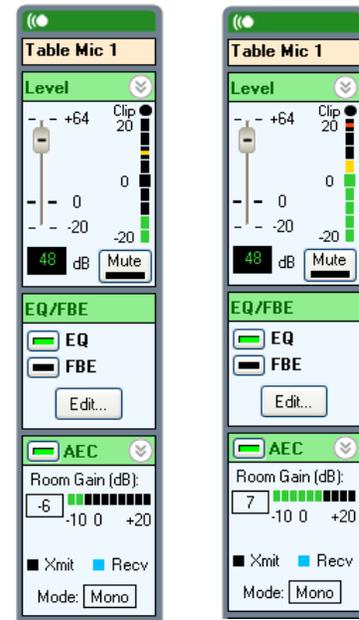
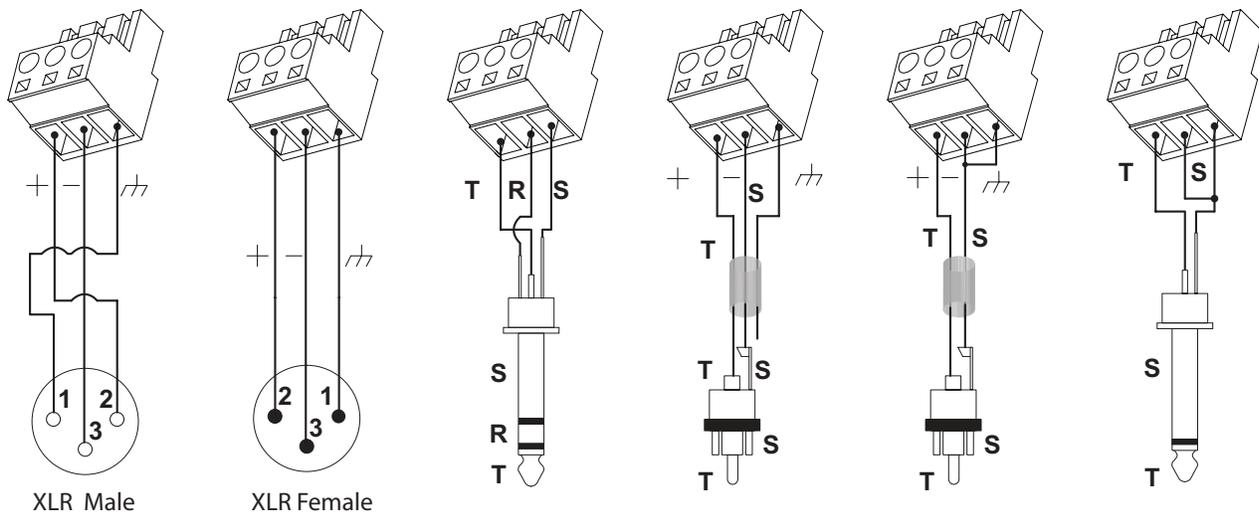


Figure 5. Room gain examples with the system on the left has good room gain (-6dB) and the system on the right has too high room gain (+7dB).

The SoundStructure Products have now been installed properly.

Additional Tips and Information

- The SoundStructure Design Guide contains the RS-232 programming guide (also found by browsing in to the SoundStructure device), a troubleshooting chapter, wiring examples, and more information on all the controls within SoundStructure Studio.
- A SoundStructure system can be controlled by any RS-232 interface or any of the Ethernet interfaces (port 52774) on any SoundStructure in an OBAM system.
- Mute and unmute crosspoints in the matrix by right clicking on the crosspoint. Double-click a crosspoint to adjust the gain of the crosspoint.
- If the remote site hears acoustic echo of their voices from the local room, try muting the local microphones. If the echo is removed, unmute on microphone and check the AEC – is it enabled? Check the reference – is the remote audio unmuted in the reference? What is the room gain on that microphone?



- Wiring balanced and unbalanced equipment to as shown in the following figure.

Figure 6.

SoundStructure may be done