

Frequently Asked Questions

Polycom® SoundStructure™ Systems



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SoundStructure Products

What are the SoundStructure products?

The SoundStructure products are Polycom's next generation installed voice products. They are rack-mounted audio products that are available in a 16x16, 12x12, and 8x8 form factor and are referred to as C16, C12, and C8 respectively. In addition, there is a sound reinforcement product called the SR12 that is a 12x12 device that can be used for non-conferencing audio applications, such as speech reinforcement, paging and similar purposes.

What are the main differences between SoundStructure and Vortex solutions?

There are a number of differences between the two products but the main differences are:

- SoundStructure products have more advanced processing such as stereo echo cancellation and feedback elimination that is available on every input.
- SoundStructure products connect to Polycom HDX video codecs through the CLink2 digital interface.
- SoundStructure products easily scale to larger systems (128 microphones as opposed to 64 microphones for Polycom Vortex® solutions) due to the OBAM interface.

Can I use my favorite microphones with SoundStructure products?

Absolutely. Nearly any analog microphone can be used with SoundStructure products. The SoundStructure products provide up to 64dB of input gain (the Vortex solution provides up to 63dB of gain) and therefore can be used with any analog microphone that has a sensitivity of about 6mV/Pa (-44dBV/Pa) or greater. In addition, the Polycom HDX® microphone array and HDX Ceiling Microphone Array can be used.

Do I need special microphones to take advantage of the 22 kHz stereo acoustic echo cancellation (AEC) on SoundStructure devices?

No. Any analog microphone can be used with the SoundStructure products. Even if the microphone frequency response is limited, it will work well with SoundStructure products, though the frequency response will be limited to the capabilities of the microphone.

What does stereo acoustic echo cancellation (AEC) mean?

Stereo AEC means that the echo canceller can cancel echoes from two completely independent sources of remote audio that are played into the local room from two different sets of loudspeakers. The two independent sources of remote audio can come from a Polycom stereo video codec (left and right audio) or from two or more monaural sources, such as two mono video codecs or multiple telephony interfaces that are mixed into two independent sets of loudspeakers. Traditional conferencing equipment can cancel echoes from one independent loudspeaker system. Multiple sources may be mixed together into that one loudspeaker system (such as mono video and telephony) but no "spatial" positional information can be leveraged with traditional conferencing equipment.

How is stereo AEC different from traditional acoustic echo cancellation?

Stereo AEC enables the use of positional information to enhance the audio experience and improve intelligibility and talker identification. For instance, the video conferencing audio can be played from a set of loudspeakers in the front of the room and telephony audio can be played from overhead loudspeakers. This makes it easier for the local room participants to know who is speaking at any given time. Due to the stereo AEC processing, the acoustic echo paths from both sets of loudspeakers can be simultaneously echo cancelled, preventing any echo from being heard by either set of remote talkers (remote video or audio participants). In traditional conferencing applications, this configuration would cause acoustic echoes to be heard by the remote talkers as they alternated speaking until the monaural AEC reconverged to the different paths, and if both sets of remote participants were speaking, a constant residual echo would be heard by both remote parties.

Are special microphones required to operate with the stereo acoustic echo cancellation (AEC) on the SoundStructure products?

No. The stereo AEC on the SoundStructure solutions works with traditional microphones or Polycom HDX microphones. The stereo processing refers to the fact that the echo paths are coming from two independent loudspeakers and cancelled after the echoes are picked up by the microphones.

Can I bus Vortex products to SoundStructure products with EF Bus?

No, the Vortex products and SoundStructure products have different bussing interfaces. The SoundStructure linking mechanism—the Polycom OBAM™ matrix architecture—is much higher speed and cannot be used with EF Bus.

Can I use the Vortex EF2201 with SoundStructure products?

No, the EF2201 links to other Vortex products over the EF Bus and the bussing is different from the bussing used with SoundStructure products.

Do I have to use the Polycom HDX microphones with SoundStructure products?

No. The Polycom HDX microphones can be used with SoundStructure products but they don't have to be used.

Can I use the Polycom HDX microphones with SoundStructure solutions even if I'm not using a Polycom HDX video conferencing system?

Yes. The Polycom HDX microphones can be used with SoundStructure products in any application—audio conferencing, video conferencing, or even sound reinforcement applications.

Can I use the Polycom HDX microphones with SoundStructure products and reinforce the microphones in the local room and use them for conferencing?

Yes, the Polycom HDX microphones can be used for in-room sound reinforcement as well as for sending audio to the remote participants. Because of the matrix in SoundStructure devices, there is the ability to route individual HDX microphones independently and utilize the feedback processing to provide additional robustness for reinforcement. In any reinforcement application, reinforcement always works better if the microphone to be reinforced is close to the local talker whose voice is being reinforced. This provides a cleaner signal to the microphone (due to its proximity) and more gain before feedback in the room because the microphone picks up less of the reinforced audio from the loudspeakers (due to the microphone being close to the talker and far from the loudspeaker). If the HDX ceiling microphone is used, it will be important to ensure there is some reasonable isolation between the microphones and the loudspeakers—and the system should be zoned in a mix-minus fashion, that is, multiple loudspeakers fed by different amplifier outputs and microphones in each loudspeaker zone are not reinforced into that zone and perhaps not in adjacent zones.

Can I use the SoundStructure devices with other video codecs or only with the Polycom HDX system?

The SoundStructure products can be used with any video conferencing system where the internal AEC on the video conferencing product can be disabled. This includes nearly every video codec product on the market.

Why do I need to disable the AEC on a video codec that I connect to SoundStructure products?

When SoundStructure products are used with a video conferencing system, the AEC processing will be performed by the SoundStructure product on a microphone-by-microphone basis. The SoundStructure device will remove the echoes and background noise, automix the microphones, and send that audio to the video codec. If the AEC is also enabled on the video codec then the video codec will try to remove echoes that have already been removed by the SoundStructure products. The additional processing on the audio signal could degrade the audio quality and reduce the full-duplex nature of the system without adding any additional value.

Can I digitally connect the SoundStructure product with my VSX video codecs? How about with the SoundStation VTX 1000 conference phone?

The CLink2 interface is not available on the VSX video codecs—only on the HDX video codecs—so it is not possible to connect the SoundStructure product to the VSX products through a digital interface. It is possible to connect the SoundStructure products to the VSX using analog input and output connections. The SoundStructure products can be connected to the SoundStation VTX1000 through analog input and output connections in the same manner that a Vortex is connected to the SoundStation VTX 1000 phone.

Is the SoundStructure API backwardly compatible with the Vortex solution?

No, there is a new API for SoundStructure devices. The SoundStructure system architecture has been designed to simplify the entire integration process, including the control system code development. The new architecture has features such as the OBAM matrix architecture, virtual channels, and virtual channel groups, that remove the need to know about device types, device IDs, and other hardware specific details. Because of these advances, the control code API has been streamlined and is much more readable and understandable than previous APIs. Virtual channels also allow the control system application be portable and easily reusable. By controlling a SoundStructure system with virtual channel names, such as "Podium Mic," the control system application doesn't need to know what the underlying physical channels are. This also speeds the control system development time because it's easier to understand what is being controlled when the actual names can be used rather than having to know, for example, that it is "input 5 on device 03."

What are virtual channels? And what is virtual about them?

A virtual channel is the way that SoundStructure products refer to the actual inputs and outputs from the system. A virtual channel is defined with a label and the underlying physical connection (for example, input 3 or output 15) and then the entire system can be configured by solely referring to the virtual channel names of the inputs and outputs. This means that rather than referring to input 5 on device 03, it is possible to simply refer to an input as "Podium Mic" and the SoundStructure device will translate the virtual channel names to the underlying physical channels.

The virtual channel concept simplifies the configuration and the control system programming, and has the added benefit that the control system code is now more portable so it can be re-used without having to rewrite it for different installations that may have different wiring and different numbers of inputs and outputs but use the same virtual channel names. The "virtual" in virtual channel means that it's an abstraction layer over the physical channel, so the virtual channel only exists as a wrapper around one or more physical channels. Virtual channels also make it easy to work with stereo signals. A stereo input signal can be referenced as a single virtual channel, such as VCR. All routing and configuration of the virtual channel will affect both the left and the right channels but the settings will be applied to the single virtual channel name. This simplifies routing and control as only one "virtual channel" needs to be configured rather than being concerned with the two underlying "physical channels".

Do any SoundStructure models come with built-in telephony?

Each SoundStructure model has a modular slot in the back for telephony cards. Single-line and dual-line PSTN, and VoIP cards are available.

Why isn't there a stand-alone telephony interface that can be linked to the other devices to form a bridge?

Each SoundStructure product can support a telephony plug-in card

that supports either one or two analog telephone lines, or a single IP line depending on which telephony plug-in card is selected. By being able to link up to eight SoundStructure devices together, up to sixteen telephone lines can be used simultaneously. The vast majority of applications require one or possibly two telephone lines—a solution that is provided with SoundStructure products—and provided in a single rack form factor. When more than two lines are required, it is possible to link multiple SoundStructure devices together and use their telephony cards. However, it may be more practical to use bridging equipment or a bridging service to provide additional flexibility (scheduling, ad-hoc, logging, billing, and so on) and/or cost advantages.

Is there a SoundStructure model with fewer than 8 inputs? In some deployments, I may only need one or two inputs.

The lowest number of inputs available on SoundStructure models is 8, with the C8 model. Some Vortex models support fewer inputs such as the EF2241.

Why is there no front panel display on the SoundStructure devices?

The SoundStructure devices do have a status LED on the front of the device to indicate whether the system is functional (green), has a warning (yellow), or has a serious warning (red). Due to the comprehensive feature set and the powerful metering capabilities of the SoundStructure devices, we want customers to use the SoundStructure Studio software to configure the devices properly and expeditiously. There are many design and configuration innovations in the SoundStructure Studio solution that would have been impossible to replicate through a front panel user interface and still keep the one rack-unit form factor. For customers that want the flexibility of a front panel display, the Vortex products offer a complete conferencing solution with front panel display and controls.

How is the SR12 different from the C12, and where would I use one instead of the other?

The SoundStructure SR12 model does not include acoustic echo cancellation, and is designed specifically for sound reinforcement environments where echo cancellation is not needed. The C12 (or other C-series model) can be used in environments that do need echo cancellation from audio and video conferencing sources.

What are the benefits of using the SR12 for sound reinforcement?

The SoundStructure SR12 model offers a number of audio processing features, including feedback elimination, dynamics processing, and advanced equalization options, that add tremendous value to sound reinforcement applications. In addition, the OBAM link makes it easy to scale for large numbers of inputs and outputs, and the SoundStructure Studio software greatly simplifies the design and installation process. Further, if you are already familiar with how to install the C-series products, you already know how to install the SR12, as well.

SoundStructure VoIP Interface



What is the SoundStructure VoIP interface?

The SoundStructure VoIP interface is a plug-in card, based on Polycom's standards-compliant UC SIP software, that can be used in all SoundStructure systems. The SoundStructure VoIP interface allows a SoundStructure system to communicate with, and make calls through, supported VoIP PBX systems.

What VoIP protocols does the SoundStructure VoIP interface utilize?

The SoundStructure VoIP interface is a SIP-based interface that utilizes Polycom's award-winning UC Software which is in Polycom SoundPoint® IP and SoundStation® IP products.

Which call control partners are compatible with the SoundStructure VoIP interface?

Partners that have verified interoperability with Polycom UC Software include: Adtran, Aptela, BroadSoft, Digium, Fonality, Interactive Intelligence, MetaSwitch, NEC Phillips, NEC Sphere, PanTerra Networks, pbxnsip, Sutus, TeleWare, and Whaleback.

For a complete list of partners that are members of the VoIP Interoperability Partner Program, Voice Field Verified Partner Platforms, and SoundPoint IP phone partners see:

http://www.polycom.com/products/voice/interoperability/platform_compatibility_spip.html

Is the SoundStructure VoIP interface compatible with a Cisco SIP or an Avaya SIP environment?

The SoundStructure VoIP interface will be verified for interoperability and compatibility with a Cisco SIP environment as a third-party SIP device.

The SoundStructure VoIP interface will also be verified for interoperability and compatibility with an Avaya Aura® Session Manager via the DevConnect program.

How do I dial the SoundStructure VoIP interface?

For typical telephony functions such as dialing the phone, answering the phone, and hanging up the phone, the standard SoundStructure API is fully compatible with the new SoundStructure VoIP Interface. No change is required to existing control system code to support the same functionality as with the SoundStructure analog telephony interfaces.

For advanced commands such as conferencing, putting calls on hold and so on, the SoundStructure API has been updated to include VoIP specific commands. See the latest SoundStructure Design Guide for the new commands.

Do I have to change my control system code to use the SoundStructure VoIP interface?

No. For basic call dialing, call answer, call hang-up, and volume control applications, the SoundStructure API has not changed and will work with an existing control system. Just name the VoIP input and output channels the same as the current telephony channels and when the control system sends commands, the SoundStructure device will respond to those commands and operate as expected.

For more advanced applications such as putting calls on hold, transferring calls, joining or splitting calls, there are new SoundStructure API commands that have been defined. If your applications require this new functionality then it will be necessary to modify the control system code to take advantage of the new functionality.

Can I use the Polycom Touch Control intuitive graphical interface with the SoundStructure VoIP interface?

Yes, Polycom Touch Control interface firmware version 1.4 or higher supports the SoundStructure VoIP Interface. Instructions for updating Touch Control firmware are described in chapter 11 of the SoundStructure Design Guide which may be found under the Help menu in SoundStructure Studio.

Does the SoundStructure VoIP interface have its own Ethernet interface?

Yes, the SoundStructure VoIP interface has a dedicated Ethernet interface for connecting to a customer's VoIP LAN. All VoIP traffic travels through the SoundStructure VoIP Interface Ethernet connection and all the SoundStructure control traffic travels through the Ethernet interface on the SoundStructure device. Having two separate Ethernet interfaces allows the VoIP LAN to be completely different from the A/V control LAN.

How many lines does the SoundStructure VoIP interface support?

The SoundStructure VoIP interface supports 12 lines and up to 24 call appearances. This means that there can be 12 different extensions or lines that can be assigned to the VoIP interface and with those 12 lines there may be up to 24 call appearances. Only 2 call appearances can be bridged together, any other call appearances would be on hold.

What is a line and why would I need more than one?

A line is the equivalent of an 'extension' that a remote party dials to reach you. Supporting more than one line makes it possible to define different numbers or extensions that remote callers can dial to reach the SoundStructure VoIP interface and then handle those calls differently, if desired.

What is a call appearance?

A call appearance is a connection between the SoundStructure VoIP interface and a remote caller. At any time each call appearance is in one of the following states: alerting (for example, ringing), a held state (on hold), or an active state where voice or data is flowing between the connected parties. The SoundStructure VoIP interface supports 24 call appearances meaning that there can be a total of 24 different parties dialed into the SoundStructure VoIP Interface simultaneously.

Can I conference together different call appearances to join different callers into a conference call directly in the SoundStructure VoIP interface?

Yes, the 24 different call appearances can be joined together, or conferenced, to create conference calls that may include at least two (2) different external call appearances per conference call.

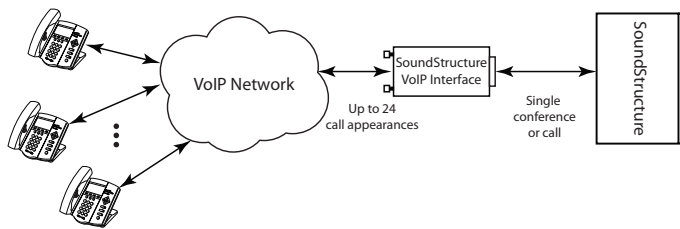
Can I dial out more than one call if the SoundStructure VoIP Interface supports 12 lines?

Yes, up to 24 outbound calls may be made, but only one call, or conference, will be active passing audio to and from the SoundStructure system. Other calls will be on hold.

How many independent calls on a SoundStructure VoIP interface are sent to the SoundStructure system?

While the SoundStructure VoIP interface supports 12 lines and 24 call appearances, one conference call with multiple participants or one individual call is sent to and from the SoundStructure device for each SoundStructure VoIP interface card in a system. In other words, multiple calls can be dialed by the SoundStructure VoIP Interface, but only one call or conference is sent to the SoundStructure device.

This method of operation is similar to how a single call or conference would be routed to the handset of a desktop VoIP phone even though there may be more calls on hold at the time. i.e., as shown below.



Do I need two VoIP interfaces to support more than one caller dialed into my SoundStructure system?

If you want to conference multiple callers into the same call, only one SoundStructure VoIP interface is required. Because the SoundStructure VoIP interface supports 24 call appearances, up to 24 different callers can be dialed into the SoundStructure VoIP interface. These callers could be joined together to form multiple conference calls with at least two (2) call appearances

Do I need two VoIP interfaces to support a two-room divide-and-combine room?

If your application requires two independent callers that will be routed differently within the SoundStructure matrix, then, yes, a SoundStructure VoIP interface for each independent call is required.

How do the new SoundStructure API commands operate on multiple lines?

There are several new SoundStructure API parameters specific to the SoundStructure VoIP interface and these parameters are designed to operate on the different lines. These parameters include voip_answer, voip_blind, voip_conference, voip_forward, voip_hold, voip_join, voip_line, voip_resume, voip_send, voip_split, and voip_transfer. The voip_line command is used to set the current line that the other VoIP commands operate on.

How do I provision the SoundStructure VoIP interface?

The SoundStructure VoIP interface is provisioned in the same manner as Polycom's SoundPoint IP or SoundStation IP products are including: TFTP, FTP, FTPS, HTTP, and HTTPS.

The SoundStructure VoIP interface can be manually configured via the SoundStructure Studio solution and the VoIP interface's Web UI, similar to how a desktop VoIP phone's settings can be manually configured from either the phone's UI or its Web UI.

Can I upgrade an existing TEL-card based project with the VoIP interface?

Yes, the SoundStructure Studio solution has been updated to make it easy to change a project that has one or more SoundStructure TEL plug-in cards to a project that is VoIP based.

Can my project mix and match TEL cards and VoIP cards?

Yes, a SoundStructure system can mix and match analog TEL cards with SoundStructure VoIP interfaces.

Does the VoIP interface support wideband audio?

Yes, in addition to the standard narrow band audio codecs of G.711 μ /A and G.729AB, the SoundStructure VoIP interface supports the high definition G.722 (7kHz audio), G.722.1 (16, 24, and 32kbps), and G.722.1C (24, 32, and 48kbps).

What do I need to tell the IT/Phone teams when I sell/install the VoIP interface?

The IT/Phone team will want to know that the SoundStructure VoIP interface is a SIP-based endpoint that can be configured and managed in the same manner as Polycom's SoundPoint IP desktop phones. The MAC address of the SoundStructure VoIP interface will be needed to allow the IT/Phone team to create the proper configuration files.

Polycom® Touch Control Intuitive Graphical Interface

Can I use the Polycom Touch Control interface directly with SoundStructure systems for my audio conferencing applications?

Yes. The Polycom Touch Control interface supports controlling a SoundStructure system for audio conferencing applications.

What can I control with the Polycom Touch Control and SoundStructure solutions?

When the Polycom Touch Control interface is paired with the SoundStructure system, then the Polycom Touch Control can directly dial one or more SoundStructure VoIP Interface, TEL1 or TEL2 telephony interfaces, change the volume of the SoundStructure system, and adjust the mute state of the SoundStructure system.

Can I use more than one Polycom Touch Control interface with a SoundStructure system?

Yes, you can pair as many Polycom Touch Control devices as you'd like with a SoundStructure system. While the typical application will be one Polycom Touch Control interface, a large room may require several Polycom Touch Control devices to distribute volume and mute controls throughout the room. All Polycom Touch Control devices operate in an identical fashion with respect to controlling the system. It is not possible to change the behavior of the Polycom Touch Control interface based on split and combine room configurations.

Can I use the Polycom Touch Control device with both an HDX video codec and a SoundStructure at the same time?

Yes, with one important clarification. During the installation process the Polycom Touch Control device is paired with either an HDX system or with a SoundStructure system. When the Polycom Touch Control device is paired with the HDX video conferencing system, then the HDX system is controlled directly, including HDX dialing, muting, and volume control. If SoundStructure devices are connected to the HDX over CLink2, then the SoundStructure devices are controlled indirectly through volume and mute messages from the HDX system over the CLink2 interface. It is not possible to dial the SoundStructure telephony interfaces with the Polycom Touch Control device if the Polycom Touch Control device is paired with the HDX system.

When the Polycom Touch Control device is paired with a SoundStructure system, the SoundStructure system is controlled directly by the Polycom Touch Control device, including dialing the SoundStructure telephony interfaces.

Can I pair one Polycom Touch Control device with an HDX system and a different Polycom Touch Control device with the SoundStructure device?

Yes. This would allow one Polycom Touch Control device to fully control the HDX system and one to control the Polycom SoundStructure system. Volume and mute adjustments by either

Polycom Touch Control would control the system properly.

Can I pair a Polycom Touch Control device with a stand-alone SoundStructure SR12 system?

Yes. The Polycom Touch Control interface can be used to mute and adjust volume on a SoundStructure SR12 system in exactly the same manner as with the SoundStructure C-series products or mixed C-series and SR12 systems. Because a stand-alone SoundStructure SR12 system does not include acoustic echo cancellation and therefore cannot be used for audio conferencing applications, use of the Polycom Touch Control device for volume adjustment, muting, and dialing is not expected to be a common application.

Where can I get more information about integrating the Polycom Touch Control interface with SoundStructure products?

See the SoundStructure Design Guide, Rev E or later. An entire chapter is dedicated to integrating the Polycom Touch Control interface with SoundStructure solutions.

Where can I get more information about using the Polycom Touch Control device with SoundStructure systems?

See the User's Guides for the Polycom SoundStructure Systems and the Polycom Touch Control Device.

Authentication

What capability does the SoundStructure authentication release provide?

Local authentication capability is offered in SoundStructure firmware release 1.6 and SoundStructure Studio 1.8 and above. Password protection prevents unauthorized users from accessing, controlling or making changes to the systems.

Can I set more than one password for different users?

Only a single password can be set up and there is a single level of authentication provided. After logging into an authentication enabled SoundStructure system a user has full administration rights as they would have when accessing a system without authentication feature enabled.

How is the password transmitted to the SoundStructure system?

The password is transmitted as clear text over the network via the SoundStructure Studio application running on a PC.

Where is the password stored? Are the passwords in the configuration file?

The password is stored locally on the device and not the configuration file. This means that configuration files can be used on multiple devices without sharing the password.

How do I recover my password if I can't remember it?

There is no way to recover the password if it is lost. However there are two methods of recovering from the situation:

1. The system can be accessed via the RS-232 control interface without a password. In that interface it is possible to turn off the authentication feature.
2. The system can be reset to factory default state – all configuration file and password information will be reset. For more information review the chapter on authentication in the SoundStructure Design Guide

Do the passwords affect RS-232 control?

No, control systems accessing the SoundStructure via the RS-232 interface do not require authentication.

Do I have to modify my control system to use authentication?

If your control system is connecting to an authentication enabled SoundStructure system over the network it must use port 52775 (rather than the standard port 52774), and must be authenticated with correct password in order to access the system.

Can I use a Polycom Touch Control system with SoundStructure Authentication feature?

At this time the Polycom Touch Control system does not support the Authentication feature on SoundStructure Systems. This feature is planned to be supported in the future and this document will be updated at that time.

Can I use APIs to enable or access authentication features?

Yes, new APIs have been added to support use of the Authentication features. A list of the authentication related APIs can be found in the SoundStructure Design Guide Rev G or higher.

Software Releases**What version of SoundStructure Studio and SoundStructure firmware do I need to link multiple devices together?**

Version 1.2 of SoundStructure Studio or higher is required to create projects for multiple SoundStructure devices. Version 1.2 or higher of the SoundStructure firmware is required to be compatible with the project files that are created by the SoundStructure Studio software.

What are the key new features in the SoundStructure 1.3 release?

SoundStructure Version 1.3 includes a number of new features, such as:

- Full support for the SoundStructure logic inputs and outputs to support push to talk microphones, split/combine room configurations, and more.
- Support for the HDX IR remote (requires an external IR receiver) for in-room control of SoundStructure for dialing the phone, adjusting volume, and so on.
- “Zero conf” Ethernet support to make it easier to connect to and configure SoundStructure devices

- Numerous performance improvements, including faster preset execution and OBAM length improvements, and feature updates including new API commands and a broadcast mode for the RS232 interface.

Can I use SoundStructure Studio software version 1.3 with configuration files created with earlier versions of SoundStructure Studio software and with earlier firmware versions?

Yes. SoundStructure Studio software version 1.3 can connect to SoundStructure devices running either the current firmware or previous version of firmware and settings may be adjusted and saved to disk and saved to devices. We recommend using SoundStructure Studio software version 1.5 for all your SoundStructure Studio application needs.

Will upgrading an existing SoundStructure system from v1.2 to v1.3 cause any problems with my system?

No. SoundStructure firmware 1.3 is compatible with configuration files from previous versions of SoundStructure Studio products and will execute the configuration files properly. Other than the performance improvements, there shouldn't be any difference.

Configuration and Control**What is zero conf networking and how does that help me?**

Zero conf is the ability for the SoundStructure device to create an IP address, called a link-local IP address, in the absence of a DHCP server. A SoundStructure device with v1.3 firmware will default to the IP address of 169.254.1.1 if the device is powered up and there is no DHCP server on the network. The link-local IP address allows an integrator to connect directly from their computer to the SoundStructure device over the Ethernet interface with either a straight through CAT5 cable or a cross over cable and then scan and configure the SoundStructure device without first having to set up an IP address manually for the SoundStructure device, which typically requires connecting the SoundStructure Studio product to a SoundStructure device via an RS232 connection.

When would I use the serial broadcast mode?

The RS232 broadcast mode enables applications where SoundStructure can send commands to another device. One application for this is camera positioning where, based on internal SoundStructure information, such as a logic button or microphone status, a SoundStructure device can be used to select different camera presets in a codec that is connected to the RS232 port on SoundStructure.

How do I get more information about the new API commands?

The SoundStructure version 1.3 (or any later version's) primer document includes information about the new API commands. Also, once you update a SoundStructure device with version 1.3 firmware you may browse into the device and view the full API specification including command descriptions and examples.

How do I create camera positioning applications?

The SoundStructure events engine may be used to create simple camera positioning applications where the microphone automixer information, for example, may be used to send commands to a video conferencing system. To create an event, follow the instructions in the SoundStructure version 1.3 primer document and use the Add Event button within the SoundStructure Studio software to create an event that uses either logic buttons or camera gating status as a source and has an action that will send camera preset commands to a video codec.

When would I use the logic ports on a SoundStructure device?

Microphones with push to talk buttons are one example. Such microphones have additional wires that can be used to indicate mute and support turning an LED on or off on the microphone. The logic support defines what actions that microphone, the other microphones in the room, and their LED lights should take based on other actions happening during a meeting. Other applications include room combining, where, as walls open or close, they trigger a switch that can be used to run different presets. As another example, the logic output ports can be used to drive an external relay that could turn on a sign to indicate the room is busy.

Is documentation available that describes how to use the logic ports and events capabilities?

Yes. Please visit the Support section on www.polycom.com and navigate to the SoundStructure pages for detailed documentation on logic and events, as well as other features in version 1.3.

What are the different ways to connect devices to the logic ports?

The wires can be soldered directly into a DB25 male connector and that connector plugged into the individual logic port DB25 female connectors on the SoundStructure device. In addition, a DB25 terminal block connector accessory is now available from Polycom which makes it easier to connect devices with no soldering required. The part number for this accessory is 2200-43228-001.

Does each SoundStructure device require a separate Ethernet or RS-232 connection?

No, only one communication port is required (but any communication port may be used) to connect to a SoundStructure system. The Ethernet or RS-232 interfaces on the individual SoundStructure devices may be used to allow multiple connections into the SoundStructure system for control, monitoring, or configuration purposes but they are not required. It does not matter which SoundStructure device you connect to when controlling a SoundStructure system that consists of multiple SoundStructure devices.

Will all control ports receive command acknowledgements to commands that are sent from a control system?

Yes. A control system may be connected to any of the Ethernet or

RS-232 interfaces and commands can be sent to a SoundStructure system. Any commands that change the value of a parameter within the SoundStructure system will cause command acknowledgments to be sent out all the other control ports.

Can I take an existing design and easily expand it to support multiple SoundStructure devices?

Yes, a Project Conversion wizard allows you to do this. SoundStructure Studio version 1.2 or higher makes it easy to grow or contract a SoundStructure configuration file. This can be done by clicking the Edit Devices button on the SoundStructure Studio Wiring page. Adjust the equipment as necessary and then, if required, channels can be added or removed to fit into the new SoundStructure devices.

Can I use multiple telephony cards in a multi-device SoundStructure system?

Yes, each SoundStructure device may have a telephony card installed. A SoundStructure system that consists of 8 SoundStructure devices may have up to 8 telephony cards. If all of those cards are the SoundStructure TEL2 cards then a total of 16 phone lines can be supported with 8 SoundStructure devices.

IR Remotes**Can I use the HDX and SoundStructure solutions together and one IR remote transmitter?**

If you would like to use one IR remote with the HDX system and SoundStructure solution linked together, the IR remote should control the HDX system. Since the conference link integration between the SoundStructure and the HDX solutions allows the HDX system to control SoundStructure device, the HDX system will be able to mute and adjust volume on the SoundStructure device without requiring the IR remote control to send commands specifically to the SoundStructure device. This means that the IR remote transmitter will control the HDX system and the HDX system will tell SoundStructure device to mute and adjust volume.

Are third-party IR remote transmitters supported?

The SoundStructure solution has been tested extensively with the Polycom HDX and VSX IR remotes. While we have not tested other IR remotes, we expect remotes that operate with a 38 kHz carrier frequency to be compatible with the IR receiver interface on a SoundStructure device.

If I don't want to use an IR receiver or use the logic functionality, should I upgrade?

If you are running version 1.2.4 firmware or earlier and need longer OBAM support, then we recommend upgrading to version 1.3.0 or later, even if you aren't using any of the other features. Other benefits of this version include several performance improvements such as faster boot time, faster preset execution, and several bug fixes.

When can I use the HDX IR remote with the SoundStructure products?

With stand-alone SoundStructure audio conferencing applications, it is now possible to use the HDX IR remote transmitter, with an external IR receiver, for controlling the SoundStructure device. The functions available include taking the phone off hook, placing the phone on hook, adjusting the incoming phone volume, muting local microphones, and dialing digits. All the buttons on the HDX IR remote may be used and their behavior may be completely customized.

Why is an external IR receiver required to use the HDX IR remote transmitter?

There is no built-in IR receiver with the SoundStructure product because the device is typically not installed with line of site visibility from the local conference participants. SoundStructure devices require an external IR receiver to receive the signals that are transmitted from a handheld IR transmitter. The IR receiver connects directly into the SoundStructure IR receiver port and is powered directly from the SoundStructure device. IR receivers available from Xantech have been tested to be compatible with the SoundStructure products.

Polycom HDX Mics

How many HDX microphones can I use with a SoundStructure system?

Each SoundStructure can support up to four HDX microphones. Each HDX microphone requires three analog inputs on the SoundStructure system. A SoundStructure C8 model (with 8 analog inputs) can support 2 HDX microphones; a SoundStructure C12 model can support 4 HDX microphones; and a SoundStructure C16 model can support 4 HDX microphones plus additional conventional microphones. The largest system would support 32 HDX microphones with 4 per SoundStructure device.

Can I customize the names “Mics” and “Amplifier” with the HDX-SoundStructure integration?

Yes, SoundStructure Studio software and firmware version 1.3 or higher allow the integration behavior between the HDX system and the SoundStructure devices to be customized to allow arbitrary channel names. Those names are still used by default in version 1.3; however, those names may be changed.

Conference Link

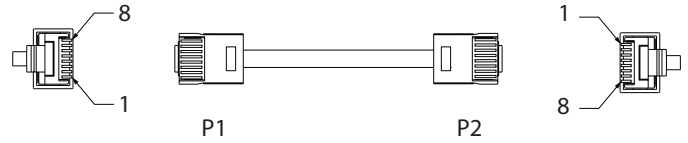
What is CLink2?

Conference Link2 cable, or CLink2 is the digital interface used by Polycom SoundStructure and HDX products to communicate to each other and to the digital microphone arrays.

What is the pin-out of the Conference Link cable?

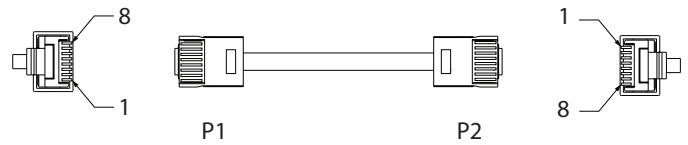
The pin-out of the Clink may be found in a number of locations, including the Best Practices Guide: Polycom SoundStructure and HDX Microphones application note, the SoundStructure Hardware Installation Guide, and the SoundStructure Design Guide.

To build a custom Conference Link2 cable, use shielded CAT5e or better, and terminate both end connectors (P1 and P2) with standard 8P8C plugs (for example, RJ45) using the wiring connections shown in the following figure. The maximum length for this cable is 100 feet (30 m). Note that this cable provides a cross-over connection between pins 1 and 2 and pins 5 and 6.



COLOR	AWG	P1		P2
WHITE/GREEN	24	1		5
GREEN	24	2		6
WHITE/ORANGE	24	5		1
ORANGE	24	6		2
WHITE/BROWN	24	7		7
BROWN	24	8		8
DRAIN WIRE	24	3		3
SHIELD		SHELL		

For cable runs of 25ft or less or if a shielded cable is not available, a high quality unshielded cable may be used and wired as shown in the following figure. We recommend shielded cable for longer runs.



COLOR	AWG	P1		P2
WHITE/GREEN	24	1		5
GREEN	24	2		6
WHITE/BLUE	24	3		3
BLUE	24	4		4
WHITE/ORANGE	24	5		1
ORANGE	24	6		2
WHITE/BROWN	24	7		7
BROWN	24	8		8

Where can I find the Conference Link cable and dongle part numbers?

The summary of Conference Link cables and dongles that are available is shown below. Also see the SoundStructure Accessory guide for photos of the different cables.

See the Best Practices Guide: Polycom SoundStructure and HDX Microphones application note on Polycom.com for examples of where the different cables and dongles are used.

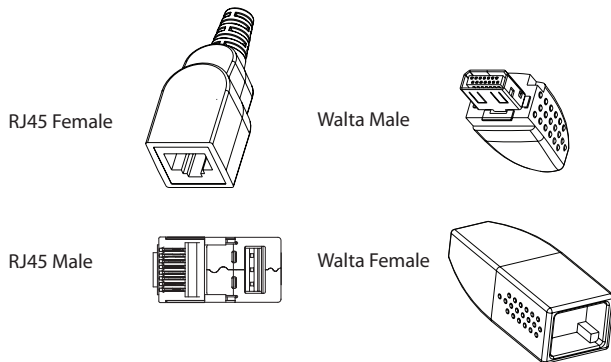
What is meant by a Conference Link ‘crossover’ cable?

To connect two Polycom devices (for example, an HDX codec and a SoundStructure device, or an HDX microphone to an HDX codec) with Conference Link, a crossover cable must be used. The term ‘crossover’ refers to swapping pins 1/2 and 5/6 on the RJ45 cables, referenced above.

Part Number	Length	Connector 1	Connector 2	Notes
2457-25646-001	18 inches	Walta male	RJ45 female	Straight-through connector conversion dongle
2457-23716-001	12 inches	Walta female	RJ45 male	Straight-through connector conversion dongle
2457-23574-001	18 inches	RJ45 male	RJ45 male	Crossover cable. Included with SoundStructure
2457-28978-001	10 feet	Walta male	Walta male	Crossover cable. Connects HDX table microphone to HDX table microphone
2457-23215-001	15 feet	Walta male	Walta male	Crossover cable. Included with HDX table microphone
2457-23216-001	25 feet	Walta male	Walta male	Crossover cable.
2200-24009-001	25 feet	RJ45 male	RJ45 male	Crossover cable. Included with the HDX ceiling microphone extension kit
2200-24008-001	50 feet	RJ45 male	RJ45 male	Crossover cable. Included with the HDX ceiling microphone kit
2200-24010-001	100 feet	RJ45 male	RJ45 male	Crossover cable. Included with the HDX ceiling microphone kit

What do the Walta and RJ45 Conference Link Connectors look like?

The following figure shows the different connections that are referenced in the table below.



Headset Interface Adapter

What does the Headset Interface Adapter (HIA) allow the user to do?

A user can leverage their existing desktop phone system to make audio-only calls and connect that audio to a large room SoundStructure system allowing for a seamless integration of familiar standard business tools with an integrated room audio system. For audio conferencing applications, the desktop phone is both the dialing interface and the telephony interface for the system.

What desktop phones are supported?

Most business desktop phones that have a headset interface are supported. Polycom, Cisco, and Avaya phones have all been tested.

What models of SoundStructure products are supported?

All C-Series models are supported.

Can the HIA be plugged into the HDX 9000 room telepresence systems?

Not directly. The HIA would be connected to the SoundStructure and SoundStructure would be connected to HDX 9000 solutions.

Is the HIA compatible with Vortex solutions?

No, because SoundStructure input processing is also used to remove the side tone from the headset interface.

Does the HIS require additional power?

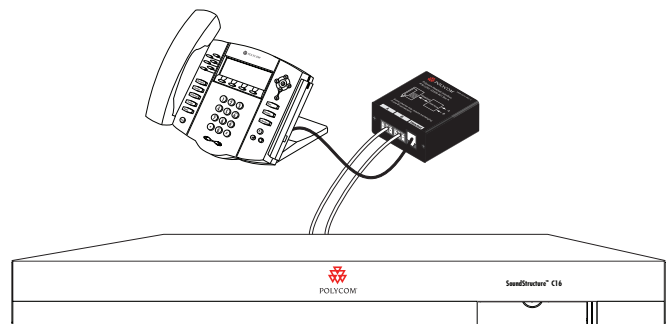
No.

How does the HIA connect to SoundStructure devices?

Physical connection is made through two included terminal block cables and an 25-foot RJ9 cable to the desktop phone.

What is the part number of the HIA?

The Polycom Headset Interface Adapter part number is 2200-33206-001.



Linking Multiple Devices

What version of firmware is required for linking multiple SoundStructure devices together?

SoundStructure Studio version 1.2 or later and SoundStructure firmware 1.2.5 or later should be used for OBAM linking of multiple devices.

What is the Polycom OBAM™ architecture solution?

The acronym OBAM stands for 'One Big Audio Matrix' which means that as multiple SoundStructure devices are linked together, the system grows with more inputs and outputs as if it were just one large system. There is one open matrix at the center of the system that allows any of the input signals to be routed to any of the outputs. OBAM is the name of the interface used to link multiple SoundStructure devices together to build larger systems.

How many signals are shared on the OBAM bus between devices?

Hundreds of signals are shared across the OBAM link when multiple devices are linked.

Can I connect the SoundStructure C-series devices with SR12 products together using the OBAM link?

Yes, you can link the C-series products with the SR12 product to build the right solution for each application. The SR12 can be used to provide more line level inputs and line level outputs to a system. The SR12 inputs can be used for program audio or for microphones that are not used in the conferencing space. The SR12 inputs do not have any acoustic echo cancellation processing, so microphones used for conferencing should always be plugged into inputs on the C-series devices.

Why would I want to link multiple SoundStructure devices?

There are applications where you may need more than 16 inputs to a system. Being able to use more than one SoundStructure device makes it possible to support these applications. Example applications include distance-learning classrooms, large meeting rooms, divisible rooms, and court room systems.

How many SoundStructure devices can I link together using OBAM architecture?

Up to 8 SoundStructure devices may be linked together to form a SoundStructure system. The largest system that may be built using OBAM matrix architecture is 128 inputs by 128 outputs when 8 SoundStructure C16 devices are linked together.

How does linking devices with the OBAM solution simplify the integration of SoundStructure products?

The beauty of OBAM architecture is that the SoundStructure system of linked devices appears as one large system. This means one matrix to configure regardless of how many devices (up to 8), which makes it very easy to set up a large system. Any input can be routed to any output, and any or all submixes can be used. There is only one set of input and output channels to configure and only one point of control (Ethernet or RS-232) is required for the entire system.

How does the OBAM architecture method differ from the way competitive products are linked together?

Competitive products typically use a much more limited bussing interface where specific audio channels are placed on the bus and then taken from the bus when the signals arrive at another device. This requires planning and design work to ensure the proper signals are both put on the bus and taken off the bus. If the designer runs out of bus channels, then it is not possible to get signals from one device to another. Sometimes the expansion requires additional I/O cards with dedicated network capabilities, further limiting options. With the OBAM architecture method, all signals are available to other linked devices without the need for any additional design effort.

Can the OBAM solution be used to connect to any devices other than SoundStructure devices? Are there any other devices that support the OBAM link?

Currently, OBAM architecture is only used as an interface to connect multiple SoundStructure units together.

Can OBAM architecture be used to connect a SoundStructure device to an HDX system?

No, SoundStructure devices connect to HDX codecs via the CLink2 connection on the back of both SoundStructure and HDX products. This CLink2 connection is independent of the OBAM architecture, but still affords designers the flexibility of routing HDX audio to any SoundStructure output.

How do I link multiple SoundStructure devices together?

To connect one device to another, connect the OBAM output from one device to the OBAM input on another device.

Is the OBAM link hot-swappable?

No, the link is not hot-swappable with the current release. To link multiple SoundStructure devices, power down the systems, link the OBAM connections between devices, and then power up the system. Once the devices are linked together it is not common to have to change the connections between devices.

How do I know the OBAM link is working properly?

There are two status LEDs on the rear panel of the SoundStructure device that indicate the status of the link. A Solid Green LED on the OBAM Out or OBAM In connection indicates that a valid link has been established. From SoundStructure Studio software, the Wiring page will show the number of devices that have been linked together. A flashing green light indicates either a cable issue or an invalid cabling configuration.

What is the longest OBAM cable that can I now use?

SoundStructure devices may now use up to a 40-foot OBAM cable between any pair of devices. A new 40-foot cable is available from Polycom (part number 2200-43229-001).

Can I purchase standard IEEE 1394B cables if I need a different OBAM cable length?

Yes, you can use the 12-inch cable that comes with SoundStructure, use the 40-foot cable that is available (2200-43229-001), or purchase your own high quality IEEE 1394B-beta cable for other lengths between 12 inches and 40 feet. The "beta" in the cable name corresponds to the cable connectors.

Where do I get more information on how to design with multiple SoundStructure devices?

The latest SoundStructure Design Guide dedicates chapter 7 to instructions on linking multiple SoundStructure devices with the OBAM solution. You may find this chapter by looking at the help option within SoundStructure Studio version 1.5.

Training

What training is available?

End customers may contact Polycom for SoundStructure training classes that are available through our training organization. Channel partners may contact their channel managers for technical SoundStructure channel training opportunities.

Check online at www.polycom.com for new training streams on how to create projects, add sound reinforcement, and take advantage of the latest features.

About Polycom

Polycom is the global leader in standards-based unified communications (UC) solutions for telepresence, video, and voice powered by the Polycom® RealPresence® Platform. The RealPresence Platform interoperates with the broadest range of business, mobile, and social applications and devices. More than 400,000 organizations trust Polycom solutions to collaborate and meet face-to-face from any location for more productive and effective engagement with colleagues, partners, customers, specialists, and prospects. Polycom, together with its broad partner ecosystem, provides customers with the best TCO, scalability, and security for video collaboration, whether on-premises, hosted, or cloud-delivered. Visit www.polycom.com or connect with Polycom on Twitter, Facebook, and LinkedIn.

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