



**HARDWARE INSTALLATION GUIDE**

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# **Polycom® SoundStructure® TEL1 and TEL2**



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# SoundStructure TEL1 and TEL2

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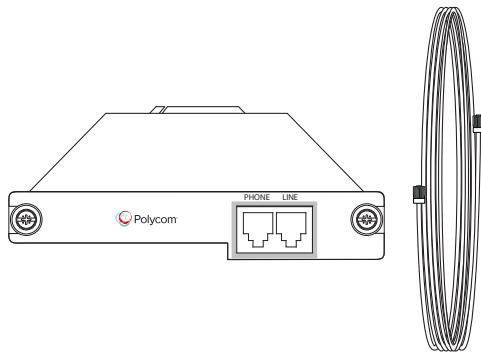
The Polycom SoundStructure® TEL1 and TEL2 telephony interfaces are plug-in cards for the SoundStructure C16, C12, C8, and SR12 audio processing devices. The TEL1 is a single-line PSTN interface and the TEL2 is a dual-line telephony interface - simultaneously supporting two independent telco calls.

The SoundStructure C16, C12, and C8 products feature acoustic echo cancellation, noise cancellation, equalization, feedback elimination, and automatic microphone mixing on all audio inputs. In addition, there is a full matrix mixer, dynamics processing, delay, and submix processing. The SoundStructure SR12 does not include acoustic echo cancellation processing but does include noise cancellation, automatic microphone mixing, matrix mixing, equalization, feedback elimination, dynamics processing, delay, and submix processing.

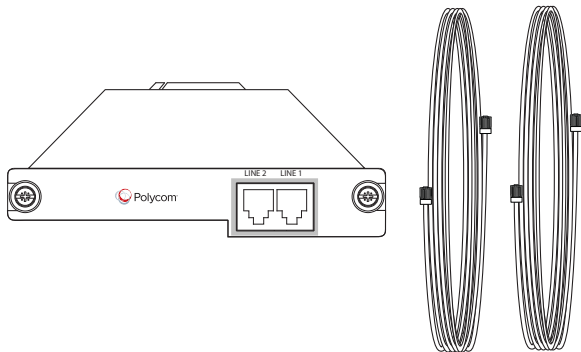
This manual provides instructions for installing the TEL1 and TEL2 telephony interface products. For information on how to terminate connections to the SoundStructure products, see the SoundStructure *Hardware Installation* manual and for information on how to configure the SoundStructure devices, refer to the *Design Guide for the Polycom SoundStructure* manual.

## What's Included With SoundStructure TEL1 and TEL2

The SoundStructure TEL1 product includes the TEL1 plug-in card, this manual, and a 15-foot long telephone cable as shown in the following figure. If a different length telephone cable is required, a minimum of 26 AWG telephony cable should be used.



The SoundStructure TEL2 package includes the TEL2 plug-in card and two 15-foot long telephone cables as shown in the following figure.



## Tools Required

A Phillips head screw driver is required to remove the blank rear-panel plate from the SoundStructure device.

## Installation

Each SoundStructure device can have one plug-in card installed for a total of eight plug-in cards in a collection of eight SoundStructure devices. When installing more than one plug-in card in an installation, it is recommended to use the plug-in slot from the top device first and continue sequentially down through the collection of devices as additional plug-cards are added. This will ensure a consistent physical channel numbering of the telephony physical channels. See the discussion of physical and virtual channels in the *Design Guide for the Polycom SoundStructure* manual.



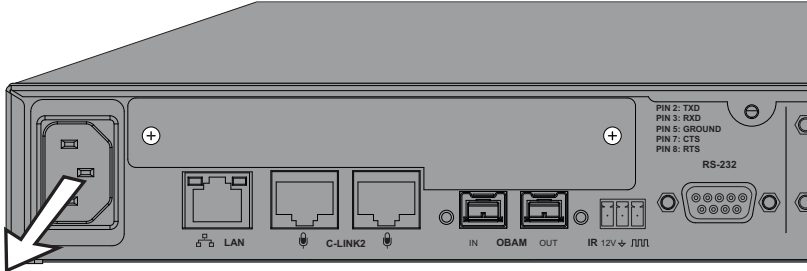
**Note:** If more than one plug-in card is used in an installation of multiple SoundStructure devices, use the plug-in slot from the top SoundStructure device first and continue sequentially down through the collection of devices as additional plug-cards are added.



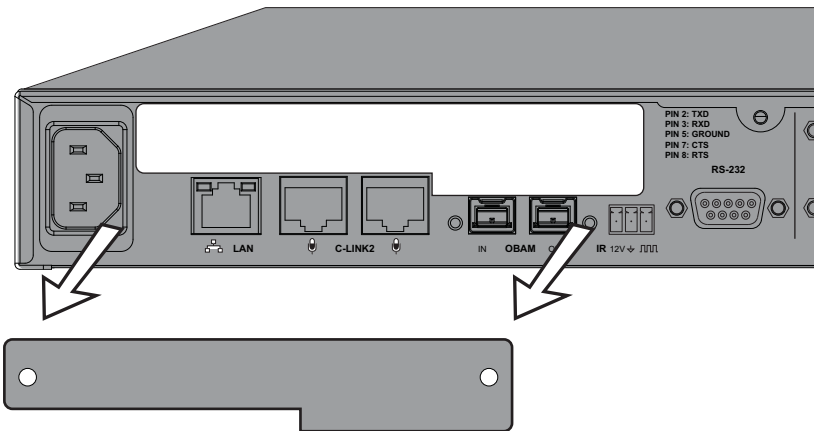
**Warning:** Do not insert a plug-in card while the SoundStructure is powered on. Failure to remove power prior to installing the plug-in card may damage the plug-in card and/or the SoundStructure device.

**To install a plug-in card, follow these steps:**

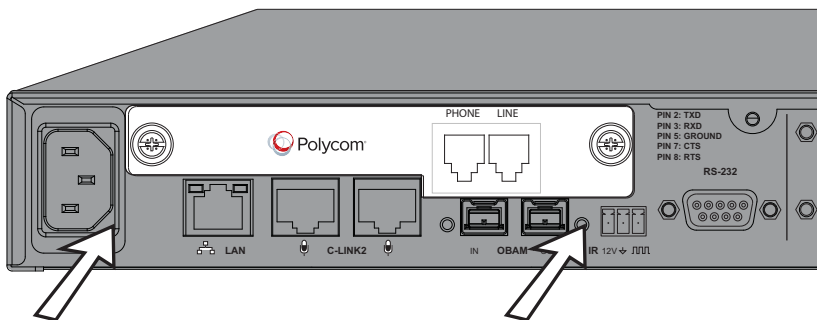
- 1 If plugged in, unplug the AC power cord from the SoundStructure device.



- 2 Remove the blank plate and screws from the expansion slot (see below).



- 3 Insert the plug-in card into the slotted rails and push until it is tight into the slot.



- 4 Tighten the thumbscrews on the rear-panel of the plug-in card.
- 5 If no further installation steps are required, plug in the AC power cable; otherwise, continue with the remainder of the installation steps described in the *SoundStructure Hardware Installation* manual prior to applying power.

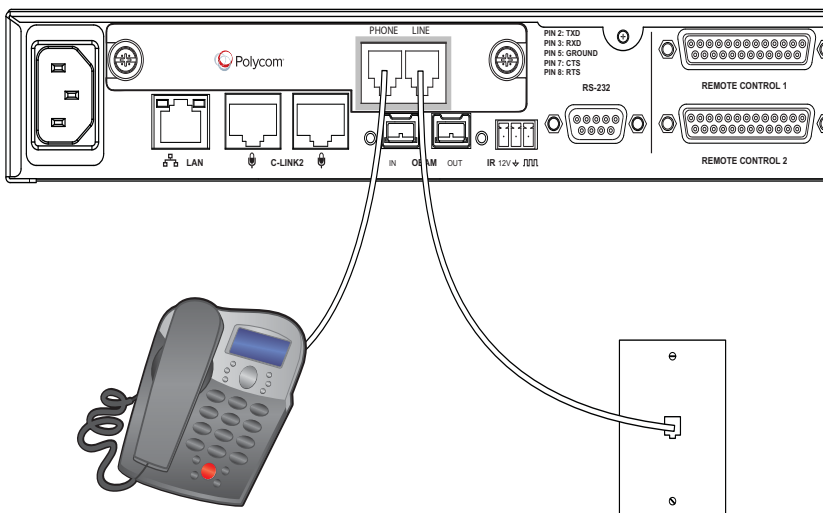
When the system boots up, the telephony card will be discovered automatically.

## Connecting To The Telephone Line

### SoundStructure TEL1

The SoundStructure TEL1 has a *LINE* interface that should be connected to the telephone line that comes from the local PBX or directly from the telephone central office. As shown in the following figure, the *LINE* interface is typically connected to the telephone wall plate that serves as the PSTN connection and the SoundStructure TEL1 *PHONE* interface is available to support an optional telephone handset.

The optional telephone handset may be used when privacy is required or for initiating a telephone call. When the TEL1 *LINE interface* is on-hook (in other words, hung up), the telephone line that is plugged into the *LINE* connector is passed through to the *PHONE* interface, allowing the telephone handset to hear dial tone and initiate calls once the optional handset is taken off-hook.

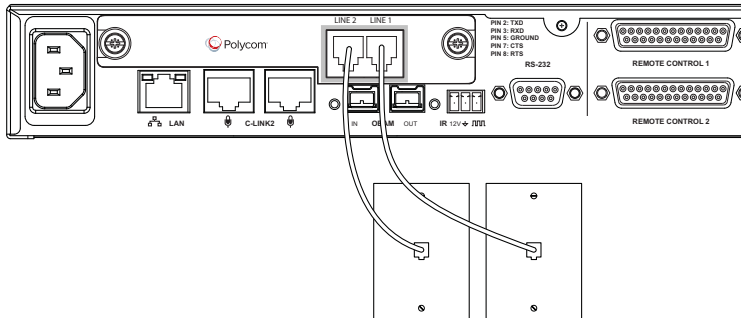


When the SoundStructure TEL1 device takes its *LINE* interface off-hook by using the SoundStructure API (See the SoundStructure Command Reference manual) `phone_connect` command, the audio from the telephone *LINE* interface is routed through the SoundStructure TEL1 and into the SoundStructure for audio processing. When off-hook, the TEL1 seizes the line from the handset and will not release it to the handset until the TEL1 is placed back on-hook (in other words, hung-up).

To use the optional telephone handset when the SoundStructure TEL1 interface is off-hook, take the handset off-hook by using the API command `phone_connect` and set the value to 0 for that telephone line. This will release the telephone audio paths from the SoundStructure device and re-enable them to the *PHONE* interface. The handset is then active and can be used to transmit and receive audio. Hanging up the handset at this point will terminate the telephone call.

## SoundStructure TEL2

The SoundStructure TEL2 has a *LINE1* and a *LINE2* interface that can both be connected directly to two analog telephone lines that comes from the local PBX or directly from the telephone central office as shown in the following figure.



Note that the TEL2 interface does not support an optional handset - both telephone connectors on the rear of the TEL2 are to be connected to analog telephone lines.

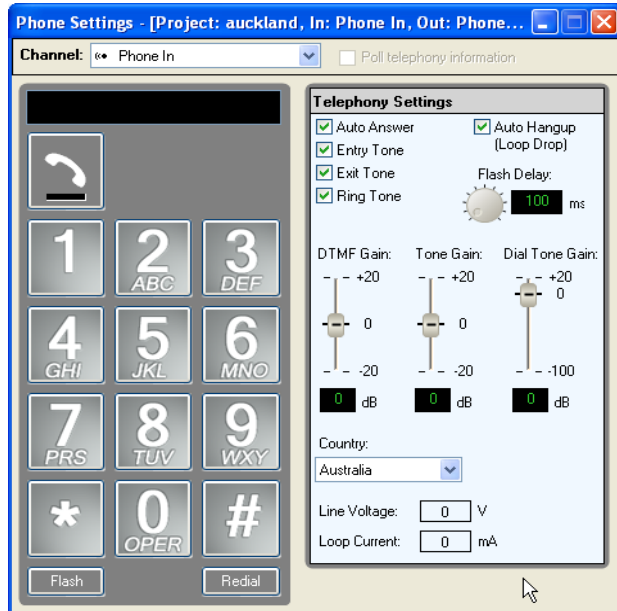
## Using The TEL1 and TEL2

The SoundStructure TEL1 and TEL2 cards are configured through the SoundStructure Studio software as described in the *Design Guide for the Polycom SoundStructure* manual.

The country setting of the telephone interface must be set prior to first use of the telephone line. The country code may be set by clicking on the phone settings button for the channel that represents the telephone input. This will show a user control, as shown in the figure below, that allows the selection of the country code for the desired region.

The line voltage and loop current are always active and allow for diagnostics of the telephone line. See the *SoundStructure Command Reference Guide* for more information on how to query the line voltage and loop current values.

Once the country code is set, the phone line may be tested by clicking the phone icon. This will take the selected phone line off-hook. Assuming the signal routing is correct through the matrix, and the phone line is plugged in and active, dial tone will be heard in the local room.



## Troubleshooting

Problem	Solution
No audio is heard on the handset when it is plugged into the PHONE interface on the TEL1	<p>Check that the TEL1 is on-hook so audio is routed to the handset.</p> <p>Check that the handset is plugged into the PHONE interface, the telephone line is plugged into the LINE interface, and check that the phone line plugged into the LINE interface is an analog phone line (POTS) and not a digital line.</p>
No loop current or line voltage is measured on the Phone Settings screen	<p>If there are multiple TEL1 or TEL2 cards make sure the correct phone line is selected. On the TEL2, ensure you are viewing the correct virtual telco channel associated with the physical phone line.</p> <p>Ensure sure the telephone line is plugged in and active by plugging an optional handset directly into telephone line and seeing if dial tone is present.</p>



Problem	Solution
Can't take the phone off-hook with the phone_connect API command	Ensure the desired virtual channel name is spelled properly and the command syntax is correct as described in the SoundStructure Command Reference document.
Don't hear dial tone in the room when the TEL1 or TEL2 LINE interface is taken off-hook	Check that the loop current and line voltage are shown on the phone settings screen and that they change when the phone is taken off-hook. Check that the telco channel is unmuted and routed properly through the SoundStructure matrix to the amplifiers that are driving audio into the local room. Check that the local room amplifiers are connected to the correct physical output channels on the SoundStructure device as confirmed on the wiring page within SoundStructure Studio.

## Regulatory Notice and Warranty

Refer to the *SoundStructure Hardware Installation Guide* for Regulatory and Warranty information.