Polycom SoundStructure Firmware 1.7.6

Applies to Polycom® SoundStructure® C8, C12, C16, SR12, and Polycom® SoundStructure® Studio

Contents

What's New for Polycom SoundStructure Firmware 1.7.6

Polycom SoundStructure Firmware 1.7.6 is a general release for SoundStructure C-series and SR-series, and offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12

Polycom SoundStructure Firmware 1.7.6 offers interoperation support for the following Polycom endpoints:

- SoundStructure® VoIP Interface
- RealPresence® Group Series
- RealPresence Immersive Studio®
- HDX® Series
- RealPresence Centro™

These release notes provide important information on software updates, system features and feature licenses, and known issues.

New Features

Firmware 1.7.6 includes the features and functionality of previous releases. There are no new features in this release.

Resolved Issues

This release includes all the resolutions for known issues resolved in previous releases. The following table lists the resolved issues for this release.

Resolved Issues for SoundStructure Firmware 1.7.6

Category	Found in Release	Description	Issue No.
Audio	1.7.3	Popping noises heard on outputs for SoundStructure C16.	HWE-80

SoundStructure Firmware and SoundStructure Studio Companion Versions

It is always recommended to use the latest versions of SoundStructure Firmware and Studio in order to benefit from new features and bug fixes. If you're not using the latest versions, Polycom recommends always using companion versions of SoundStructure Studio and SoundStructure Firmware.

The following table lists the companion versions documented in these Release Notes.

Companion Versions of SoundStructure Studio and Firmware

SoundStructure Studio Version	SoundStructure Firmware Version	Major feature
1.9.1	1.7.6	Bug fixes
1.9.1	1.7.5	New ITP configurations
1.9.1	1.7.4	Bug fixes
1.9	1.7.3	New SoundStructure hardware
1.9	1.7.2	Bug fixes
1.9	1.7.1	Real-time audio fix
1.9	1.7	Support for Polycom RealPresence® Group Series
1.8	1.6.x	Ethernet authentication
1.7	1.5	Support for SoundStructure VoIP Interface
1.5	1.3.x	Support for Polycom Touch Control
1.4	1.3.x	Support for preset recorder
1.3	1.3.x	Support for Events and Logic
1.2	1.2.x	Support for multi-device bussing with OBAM
1.1	1.1.x	Support for partial presets and SR12
1	1	Initial release

Known Issues and Suggested Workarounds

The following issues are known to be present in the current release. These issues will be reviewed for possible fixes in a future release if no reasonable workaround is available.

Known Issues and Workarounds for SoundStructure Firmware and SoundStructure Studio

Category	Issue No.	Release	Description	Workaround
Audio	SERH-23	Firmware 1.6.0	A power brown-out causes DSP fifos to no longer sync.	Reboot the SoundStructure.
Configuration	IVBS-843	Studio 1.8.0	An Access Violation Exception error displays when you try to get a configuration file from a C16-C16 OBAM device.	
Connectivity	SERF-728	Firmware 1.7.0	Errors occur and the message "bus disconnect" is displayed when 40' OBAM cables are connected to a SoundStructure system.	
Connectivity	SERF-805	Firmware 1.7.4	Device is shown as unsearchable in the Connect to Devices window in the RS-232 interface after upgrading or downgrading to a new application.	Downgrade to firmware 1.7.3
Hardware	SERF-631	Firmware 1.7.0	Error messages for Gzip display at start-up, and SoundStructure fails to finish starting when you reset a new SoundStructure system to faculty defaults.	Change the recovery mechanism for SoundStructure to not switch between partitions when the partition is empty.
OBAM	SERF-816	Studio 1.9.0	Events are not updating in the config.xml file of connected devices in OBAM Unit.	
Registration	SERF-624	UC Software 4.1.0	Lines that are registered display as unregistered on the SoundStructure VoIP Interface.	For each line that exhibits this issue, take the line offhook, then put it back onhook. For example, if line 2 is showing as unregistered even though it is registered, then run the following commands: set voip_line "VoIP Out" 2 set phone_connect "VoIP Out" 0

Category	Issue No.	Release	Description	Workaround
Software	IVBS-490	Studio 1.8.0	An error message displays for meter parsing when you use the preset recorder in SoundStructure Studio.	
Software	IVBS-579	Firmware 1.6.0	SoundStructure crashes and an exception error displays when you try to add a microphone to the Mics group in SoundStructure Studio.	
Software	IVBS-844	Studio 1.8.0	SoundStructure Studio crashes and displays an Unhandled Exception error message when you try to close a project after a project conversion.	
Software	IVBS-845	Studio 1.8.0	SoundStructure Studio crashes and displays an Unhandled Exception error message when you try to close an offline OBAM project.	
Software	IVBS-863	Studio 1.8.0	SoundStructure Studio displays an Unhandled Exception error message when closing SoundStructure Studio.	
Software	IVBS-948	Studio 1.9.0	SoundStructure Studio is unable to create volume auto-events for video codecs present in the configuration.	
Software	IVBS-949	Studio 1.9.1	SoundStructure Studio 1.9.1 application fails to launch on Windows XP computers.	Downgrade to SoundStructure Studio 1.9.0.

Updates to Previous Software Releases

This section lists new, enhanced, and discontinued software features in previous SoundStructure Firmware and SoundStructure Studio releases.

Polycom SoundStructure Firmware 1.7.5

Polycom SoundStructure Firmware 1.7.5 is a general release for SoundStructure C-series and SR-series, and offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12

Polycom SoundStructure Firmware 1.7.5 offers interoperation support for the following Polycom endpoints:

- SoundStructure® VoIP Interface
- RealPresence® Group Series
- RealPresence Immersive Studio®
- HDX® Series
- RealPresence Centro™

These release notes provide important information on software updates, system features and feature licenses, and known issues.

New Features

Firmware 1.7.5 includes the features and functionality of previous releases and includes the following new features:

- [New ITP configurations](#)

New ITP configurations

Firmware 1.7.5 includes support for new loudspeakers in Polycom ITP products:

- RealPresence Immersive Studio
- RealPresence Immersive Studio Flex

Resolved Issues

This release includes all the resolutions for known issues resolved in previous releases. There are no new resolved issues for this release.

Polycom SoundStructure Firmware 1.7.4

Polycom SoundStructure Firmware 1.7.4 is a general release for SoundStructure C-series and SR-series, and offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12

Polycom SoundStructure Firmware 1.7.4 offers interoperation support for the following Polycom endpoints:

- SoundStructure® VoIP Interface
- RealPresence® Group Series
- RealPresence Immersive Studio®
- HDX® Series
- RealPresence Centro™

These release notes provide important information on software updates, system features and feature licenses, and known issues.

New Features

Firmware 1.7.4 includes the features and functionality of previous releases. There are no new features in this release.

Resolved Issues

This release includes all the resolutions for known issues resolved in previous releases. The following table lists the resolved issues for this release.

Resolved Issues for SoundStructure Firmware 1.7.4

Category	Found in Release	Description	Issue No.
Cisco	1.7.2	Ethernet port does not consistently negotiate 100 Full Duplex with Cisco 4500 switches.	SERF-815

Polycom SoundStructure Studio 1.9.1 Release Notes

Polycom SoundStructure Studio 1.9.1 is a general release for Polycom SoundStructure C-series, SR-series, SoundStructure VoIP Interface, and RealPresence Group Series platforms.

Polycom SoundStructure Studio 1.9.1 offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12
- SoundStructure VoIP Interface
- RealPresence Group Series
- RealPresence Centro

The following sections list the new and enhanced features and capabilities in this release.

New or Enhanced Features

SoundStructure Studio 1.9.1 includes the features and functionality of previous releases. There are no new features for this release.

Resolved Issues

The following table lists the resolved issues for this release.

Resolved Issues for SoundStructure Studio 1.9.1

Category	Found in Release	Description	Issue No.
Studio	1.9.0	The VoIP dialer in SoundStructure Studio does not display the Resume button after a transfer of an on-hold Skype for Business call is cancelled.	VOIP-120220

Polycom SoundStructure Firmware 1.7.3

Polycom SoundStructure Firmware 1.7.3 is a general release for SoundStructure C-series and SR-series, and offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12

Polycom SoundStructure Firmware 1.7.3 offers interoperation support for the following Polycom endpoints:

- SoundStructure® VoIP Interface
- RealPresence® Group Series
- RealPresence® Immersive Studio
- HDX® Series
- RealPresence Centro™

These release notes provide important information on software updates, system features and feature licenses, and known issues.

New Features

Firmware 1.7.3 includes the features and functionality of previous releases and includes the following new features:

- New Hardware
- Hardware and Software Compatibility

New Hardware

The SoundStructure C-series and SR-series hardware was updated in this 1.7.3 release, and includes the same features and functionality of previous hardware versions.

The following table includes the part numbers for the new hardware supported in this release.

Part Numbers for New Hardware

SoundStructure System	Part Number
SoundStructure C8	2200-33080-001 Rev EH
SoundStructure C12	2200-33120-001 Rev EH
SoundStructure C16	2200-33160-001 Rev EH
SoundStructure SR12	2200-36120-001 Rev EG

Hardware and Software Compatibility

The new SoundStructure C-series and SR-series hardware only supports firmware versions 1.7.3 and 1.6.2 and later. Previous versions of firmware, including versions 1.5.x and earlier, are not supported on the new SoundStructure hardware.

Resolved Issues

This release includes all the resolutions for known issues resolved in previous releases. The following table lists the resolved issues for this release.

Resolved Issues for SoundStructure Studio Firmware 1.7.3

Category	Found in Release	Description	Issue No.
Audio	1.7.2-hf4	Improved the performance of the multi-channel echo canceller, which affects RealPresence Immersive Studio and RealPresence OTX Studio systems only.	GS-30876
Device Status	1.7.2	The temperature warning threshold for sensor 3 was too low, which caused the `dev_temp_status` parameter to issue a warning at a low temperature. This has been corrected to use the same threshold that is used in SoundStructure Studio.	SERF-809

SoundStructure Firmware 1.7.2 Release Notes

Polycom SoundStructure Firmware 1.7.2 is a general release for SoundStructure C-series and SR-series. Polycom SoundStructure Firmware 1.7.2 offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12

Polycom SoundStructure Firmware 1.7.2 offers interoperation support for the following Polycom endpoints:

- SoundStructure® VoIP Interface
- RealPresence® Group Series
- RealPresence® Immersive Studio
- HDX® Series

New or Enhanced Features

There are no new or enhanced features for this release.

Resolved Issues

The following table lists the resolved issues for this release.

Resolved Issues for SoundStructure Firmware 1.7.2

Category	Found in Release	Description	Issue No.
Lync	1.7.0	When the SoundStructure VoIP Interface is a participant in a meeting started remotely using the Lync Meet Now feature, you can now unmute the SoundStructure VoIP Interface after the presenter has muted your audio. Note: The SoundStructure VoIP Interface must be running UC Software 5.2.0.8330 or later to fix this issue.	SERF-726
Networking	1.7.0	The SoundStructure is now responsive when a channel is set up for smart pairing with a device ID that is out of range for the SoundStructure system.	SERF-740

SoundStructure Firmware 1.7.1 Release Notes

Polycom SoundStructure Firmware 1.7.1 is a general release for SoundStructure C-series and SR-series that offers a fix for an issue with real-time audio on SoundStructure devices. Polycom SoundStructure Firmware 1.7.1 offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12

Polycom SoundStructure Firmware 1.7.1 offers interoperation support for the following Polycom endpoints:

- SoundStructure VoIP Interface
- RealPresence Group Series
- HDX Series

The following sections list the new and enhanced features and capabilities in this release.

New or Enhanced Features

There are no new or enhanced features for this release.

Enhanced Capabilities

SERF-717   You can no longer hear a popping or cracking noise during PSTN audio calls when you are using more than 20 microphones in the automixer on a SoundStructure device.

Polycom SoundStructure Studio 1.9.0 Release Notes

Polycom SoundStructure Studio1.9.0 is a general release for Polycom SoundStructure C-series, SR-series, SoundStructure VoIP Interface, and RealPresence Group Series platforms.

Polycom SoundStructure Studio 1.9.0 offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12
- SoundStructure VoIP Interface
- RealPresence Group Series

The following sections list the new and enhanced features and capabilities in this release.

New or Enhanced Features

IVBS-869   Added support for RealPresence Group Series and changed the Polycom video codec labeling from HDX to Polycom Video Codec, Polycom IR Remote, ConferenceLink, and Polycom Table Mic in the SoundStructure Studio Project Creation Wizard.

IVBS-870   Changed the HDX labeling to Polycom Video Codec in the SoundStructure Studio Edit Channels dialog.

IVBS-871   Changed the HDX labeling to Polycom IR Remote in the SoundStructure Studio Edit Channels dialog.

IVBS-872   Changed HDX labeling to Polycom Video Codec and Polycom IR Remote in the SoundStructure Studio Convert Project Wizard.

IVBS-873   Changed HDX labeling to ConferenceLink and Polycom Table Mic in the SoundStructure Studio Wiring page.

IVBS-878   Added support in SoundStructure Studio for the `voip_notification` parameter for Microsoft® Lync™ certification and displays notification messages at the top of the Dialer page and in the Notification tab on the Dialer page.

Resolved Issues

The following table lists the resolved issues for this release.

Resolved Issues for SoundStructure Studio 1.9.0

Category	Found in Release	Description	Issue No.
Software	1.8.0	SoundStructure Studio no longer crashes after your computer is awakened from Sleep mode when the RS-232 port is open and receiving data.	IVBS-572

Category	Found in Release	Description	Issue No.
Software	1.8.0	Project files no longer cause SoundStructure Studio to crash when you delete channels or sub mixes in a group and add new output channels within the same group.	IVBS-897
User Interface	1.8.0	An error message no longer displays when you save a project file after editing a text field on the Channels page. Additionally, project files no longer save as an unrecoverable 0 KB file on the Channels page.	IVBS-868

SoundStructure Firmware 1.7.0 Release Notes

Polycom SoundStructure Firmware 1.7.0 is a general release for SoundStructure C-series and SR-series. Polycom SoundStructure Firmware 1.7.0 offers support for the following Polycom endpoints:

- SoundStructure C8
- SoundStructure C12
- SoundStructure C16
- SoundStructure SR12

Polycom SoundStructure Firmware 1.7.0 offers interoperation support for the following Polycom endpoints:

- SoundStructure VoIP Interface
- RealPresence Group Series
- HDX Series

The following sections list the new and enhanced features and capabilities in this release.

New or Enhanced Features

SERF-659 Added support for the `voip_notification` parameter, which displays status updates as notification messages in SoundStructure Studio.

SERF-660 Added support for `voip_popup` parameter, which displays dialog with automatic status updates.

SERF-661 Added support for UC software location information parameters set on Lync Server.

Enhanced Capabilities

SERF-641 When SoundStructure detects HDX codecs or RealPresence Group Series codecs over ConferenceLink, it is indicated in the logs as "Polycom Video Codec" instead of "HDX Codec." This allows the same message and behavior to support both codec families.

SERF-642 When SoundStructure detects HDX table microphones or Group Series table microphones over ConferenceLink, it is indicated in the logs as "Polycom Table Mic" instead of "HDX Table Mic." This allows the same message and behavior to support both codec families.

SERF-643   When SoundStructure detects HDX ceiling microphones or Group Series ceiling microphones over ConferenceLink, it is indicated in the logs as "Polycom Ceiling Mics" instead of "HDX Ceiling Mics." This allows the same message and behavior to support both codec families.

SERF-644   When SoundStructure detects a conference phone over ConferenceLink, it is indicated in the logs as "Polycom Conference Phone" instead of "Onyx Conference Phone." This allows the same message and behavior to support future ConferenceLink conference phones.

SERF-645   The `click_num_attached` parameter now includes all Polycom table microphones in parameter index 2.

SERF-646   The `click_num_attached` parameter now includes all Polycom codecs in parameter index 4.

SERF-647   The `click_num_attached` parameter now displays all microphones, codecs, and conference phones as Polycom Table Mics, Polycom Ceiling Mics, Polycom Video Codecs, and Polycom Conference Phones.

SERF-648, SERF-649, SERF-650, SERF-651, SERF-652, SERF-653   The documentation in the SoundStructure embedded web pages has been updated to refer to "HDX" and "Group Series" devices collectively as "Polycom Video Codec" and similar names.

SERF-684   The `sys_meter_period` parameter is now an external parameter.

Configuration Parameter Enhancements

Refer to the following table for a list of all enhancements made to Polycom SoundStructure Firmware 1.7.0 configuration parameters.

SoundStructure Firmware 1.7.0 Parameter Enhancements

Parameter	Permitted Values	Default
voip_notification	**1 to 32**	**1**
Displays automatic status updates retrieved from the SoundStructure VoIP Interface.		
voip_popup	**String**	**String**
Displays immediate status notifications retrieved from the SoundStructure VoIP Interface.		
voip_loc_city	**String**	**String**
Displays the city field when the Lync Server is configured with location information. Corresponds with the `loc.Info.x.A3` Polycom UC software parameter.		
voip_loc_company_name	**String**	**String**
Displays the company name field when the Lync Server is configured with location information. Corresponds with the `loc.Info.x.NAM` Polycom UC software parameter.		
voip_loc_country	**String**	**String**
Displays the country field when the Lync Server is configured with location information. Corresponds with the `loc.Info.x.country` Polycom UC software parameter.		

Parameter	Permitted Values	Default
voip_loc_description	**String**	**String**

Displays the description field when the Lync Server is configured with location information. Corresponds with the `loc.Info.x.label` Polycom UC software parameter.

voip_loc_house_number	**String**	**String**

Displays the house number field when Lync Server is configured with location information. Corresponds with the `locInfo.x.HNO` Polycom UC software parameter.

voip_loc_house_number_suffix	**String**	**String**

Displays the house number suffix field when Lync Server is configured with location information. Corresponds with the `locInfo.x.HNS` Polycom UC software parameter.

voip_loc_location	**String**	**String**

Displays the additional location field when Lync Server is configured with location information. Corresponds with the `locInfo.x.LOC` Polycom UC software parameter.

voip_loc_postal_code	**String**	**String**

Displays the postal code field when Lync Server is configured with location information. Corresponds with the `locInfo.x.PC` Polycom UC software parameter.

voip_loc_postal_directional	**String**	**String**

Displays the postal directional field when Lync Server is configured with location information. Corresponds with the `locInfo.x.POD` Polycom UC software parameter.

voip_loc_pre_directional	**String**	**String**

Displays the pre directional field when Lync Server is configured with location information. Corresponds with the `locInfo.x.PRD` Polycom UC software parameter.

voip_loc_state	**String**	**String**

Displays the state field when Lync Server is configured with location information. Corresponds with the `locInfo.x.A1` Polycom UC software parameter.

voip_loc_street_name	**String**	**String**

Displays the street name field when Lync Server is configured with location information. Corresponds with the `locInfo.x.RD` Polycom UC software parameter.

voip_loc_street_suffix	**String**	**String**

Displays the street suffix field when Lync Server is configured with location information. Corresponds with the `locInfo.x.STS` Polycom UC software parameter.

SoundStructure Firmware 1.6.1 Release Notes

SoundStructure Firmware 1.6.1 is a minor release that includes the bug fixes described below. All customers are recommended to upgrade their SoundStructure systems to Firmware 1.6.1 to avoid potential problems.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web site. The contents of this checksum file are shown below.

`5ebc76319bf97e5a662966041d267fec106cd685 firmware-1.6.1.bin`

Bug Fixes

SERF-371   Fixed an issue in the flash memory driver that could result in the device becoming unresponsive until rebooted. This condition could be triggered by repeated running of presets in a specific order with a specific configuration loaded into a device. The effect of the bug was to cause a software failure on SoundStructure resulting in the front panel LED changing to solid yellow, an error message in the log (typically about "address not mapped to object"), and the device would become undiscoverable, unresponsive via RS232 or Ethernet, and would require a reboot.

SERF-628   Fixed an issue in the flash memory driver that could cause systems running in elevated temperature operating environments(> 40 °C ambient) to fail to successfully reboot when power-cycled. If this happened, the devices would have their front panel LED flashing green, and SoundStructure Studio would be unable to discover or control the device. If a device was in this state, it required the user to power the device off, allow it to cool into a valid temperature operating range, and then power it back on.

SERH-23   Fixed an issue that could cause a SoundStructure device to fail to successfully re-boot after executing a `sys_reboot` command. This issue only affects customers who are routinely using the `sys_reboot` command. The symptom of this bug is that after issuing a `sys_reboot` command, the device's front panel LED will remain in the flashing green state and never change to solid green. In this state, the device cannot be discovered or controlled by SoundStructure Studio, and requires a manual power-cycle to recover.

Polycom® RealPresence® Group Series SoundStructure System Firmware and SoundStructure Studio Compatibility

SoundStructure System Firmware 1.6.1 and SoundStructure Studio 1.8.0 are compatible with the RealPresence Group Series video systems. However, in the current release of SoundStructure Firmware and Studio, only HDX systems components and audio routing are identified in the user interface.

To use SoundStructure with RealPresence Group series products, users can simply select the equivalent 'HDX' option for the system component or audio routing that is being configured for integration with Group Series products. The next release of SoundStructure Firmware and Studio will be updated so that the system component and audio routing descriptions address both HDX and RealPresence Group Series products.

SoundStructure Studio 1.8.0 Release Notes

SoundStructure Studio version 1.8.0 is a release that includes support for Ethernet Authentication. Detailed information about the Authentication feature, new API commands and parameters are described in the SoundStructure Authentication Chapter of the SoundStructure Design Guide (Revision G, Chapter 12).

New Features

Authentication

- The Authentication feature has been added to SoundStructure Studio 1.8.0 and companion SoundStructure Firmware 1.6.0. Use of the Authentication is optional, and the default system shipping configuration has Authentication disabled. A new Authentication dialog is available in SoundStructure Studio; it allows for enabling Authentication and setting the password, as shown in red box in the figure below. Authentication may be enabled via SoundStructure Studio without specifying a password and in those cases the password will be the default '456'.
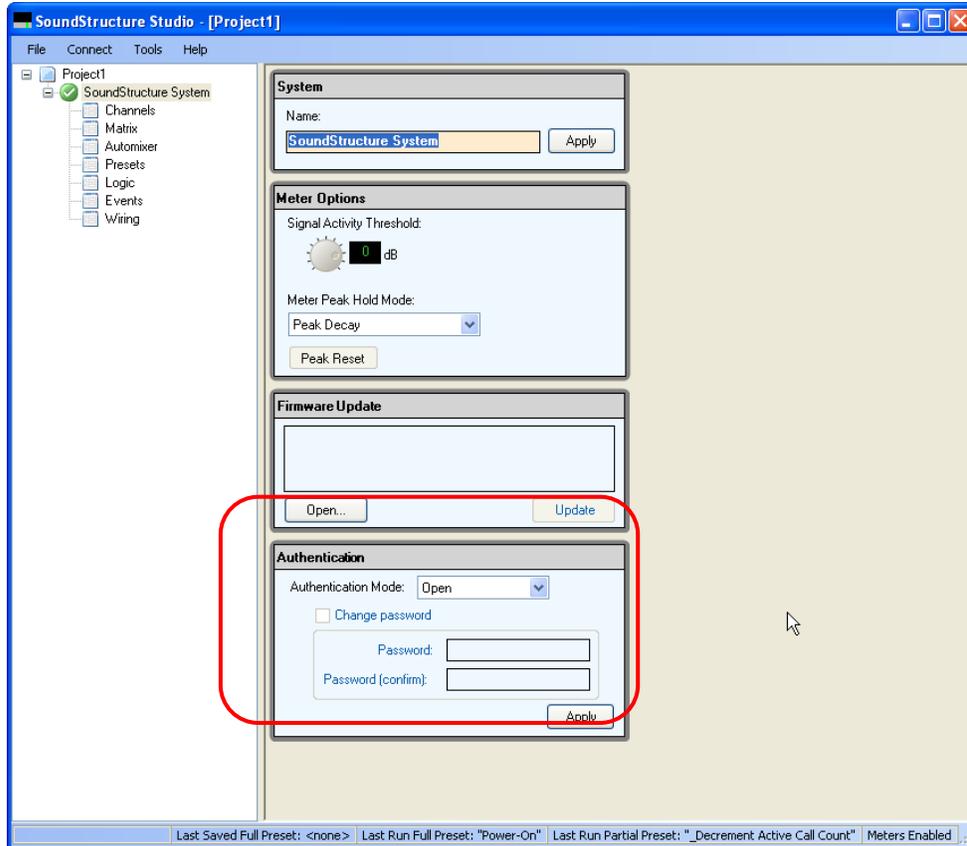
Authentication available for network access, but not direct connection to RS-232 port

- When Authentication is enabled a login is required to access the SoundStructure system over the network, however you may always access the system via the RS-232 port without logging in. The RS-232 port on an Authentication enabled system can be used for third party control systems without logging in with a password.

Authentication Feature Enablement

- Authentication can only be enabled for the Ethernet connection to the SoundStructure system. Login credentials are entered and stored on the device separate from the configuration file. This means that configuration files can be shared among multiple devices without sharing or revealing login credentials.

Authentication feature supports a single level of authorization

- An authenticated user has 'Admin' authorization, there are no other types/levels of user access.

Authenticated Systems use port 52775

- SoundStructure systems with Authentication enabled use port 52775 for access over network, unauthenticated systems use port 52774. This means that SoundStructure Studio versions prior to 1.8 cannot discover a system that has Authentication enabled. When Authentication is enabled, any third party control systems that are connected over a network will lose their connection on port 52774 and must reconnect on port 52775.

Password/Login Credentials Transmission

- Transmitted in clear text (no encryption) via online connection to SoundStructure. Password can be any string of characters and digits, 128 characters or less, no minimum.

SoundStructure Device Discovery

- The computer running Studio must be on the same subnet as the SoundStructure system for automatic system discovery. SoundStructure Studio can discover SoundStructure Systems as with previous versions by using: "Menu: Connect> Search for Devices". Authentication enabled systems are identified with a 'Key' symbol as shown in the figure below.
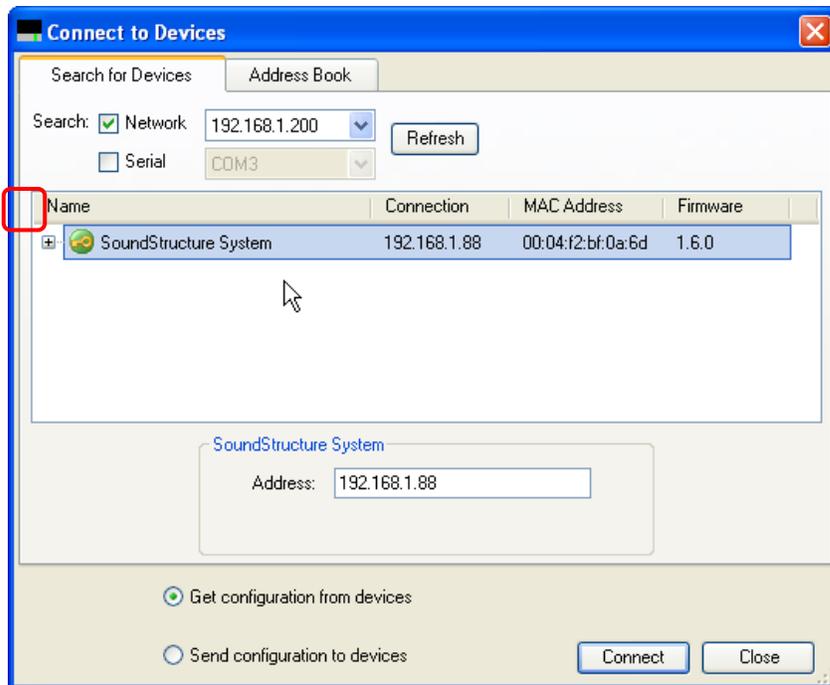
Version Checking (SoundStructure Studio 1.7)

- SoundStructure Studio version 1.7 introduced a version checking feature that does not allow files saved with a newer version of SoundStructure Studio to be opened by older versions of SoundStructure Studio. Thus, configuration files saved in SoundStructure Studio 1.8 cannot be opened in Studio 1.7. This feature avoids the loss of configuration file details associated with new features when opened with a version of Studio that does not support the features. Versions of Studio prior to 1.7 do not support version checking and thus are vulnerable to loss of configuration file details if opening files saved by later versions of Studio.

Bug Fixes

IVBS-817   Fixed an issue where a VoIP call transferred to another party which rejected the call, the 'End Call' soft key was not visible.

IVBS-819   Fixed an issue where a SoundStructure VoIP call to a conference bridge displayed the wrong soft keys when a 'Blind Transfer' was initiated. Now shows 'Resume', 'New call', 'Transfer' and 'Conference' instead of the incorrect soft keys 'Send' and 'Cancel'.

Feature Implementations and Known Limitations

IVBS-857   There is a known limitation in SoundStructure Studio when the number of channels on the Channels or Logic views exceeds approximately 295 channels. Beyond channel 295, the mouse events exceed the maximum coordinate space that Windows can support. A suggested work-around is to group large numbers of channels as channel groups and expand and collapse them as needed.

SoundStructure Firmware 1.6.0 Release Notes

SoundStructure Firmware version 1.6.0 is a SoundStructure device firmware release that includes support for Authentication and is intended to be used with SoundStructure Studio version 1.8.x. Detailed information about the Authentication feature, new API commands and parameters are described in the SoundStructure Authentication Chapter of the SoundStructure Design Guide (Revision G, Chapter 12).

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web site. The contents of this checksum file are shown below.

```
1413b0bbc71ab2991a885e36ef3ececaa0150cee firmware-1.6.0.bin
```

New Features

Please refer to the SoundStructure Studio 1.8.0 Release Notes in the section above for description of the following firmware 1.6.0. features:

- Authentication
- Authentication available for network access, but not direct connection to RS-232 port
- Authentication Feature Enablement
- Authentication feature supports a single level of authorization
- Authenticated Systems use port 52775
- Password/Login Credentials Transmission:

Third party control device enablement with Authentication feature

- When a control system (or any client) connects to a SoundStructure system that has Authentication enabled, the control session will start out in the "unauthenticated" state. In this state, all commands except those on the white-list (see below) will fail with the error message "authentication required for control." In order to authenticate the control session, the control system must send the "authenticate" command with a username of "admin" and the password that was set when authentication was enabled.

The following table summarizes the Authentication requirements for third party control systems.

Authentication Requirements for Third Party Control Systems

Mode	Open	Authentication
Network Port:	52774	52775
Network Authentication:	No Authentication	User: admin Password: system password
RS-232 Serial Port:	No Authentication	No Authentication

White-list of parameters defined for Authentication enabled systems

The following list specifies a white-list of read-only parameters that can be queried without authentication on systems running FW 1.6. The white-list parameters allow status checking/monitoring of authentication enabled systems but do not allow any changes to settings.

Parameters for Authentication-Enabled Systems

White-list Parameter Names	
clink_num_attached	dev_status
dev_type	dev_firmware_ver
dev_habanero_ver	dev_hw_eco
dev_hw_rev	dev_plugin_type
dev_uptime	dev_temp
dev_temp_status	dev_volt_clink
dev_volt_neg_15	dev_volt_phantom
dev_volt_pos_15	eth_auth_mode
eth_mac	eth_settings
ser_baud	ser_control_mode
ser_flow	sys_bus_id
sys_devices_match	sys_name
sys_num_devices	sys_plugins_match
voip_eth_settings	voip_status
voip_uc_sw_ver	

Recovering Lost Password

There are two methods of recovering from situation of lost password

1 Connect to the system over RS-232 and disable authentication. By design, the RS-232 interface always operates in Open mode

Pin 9   Pin 1
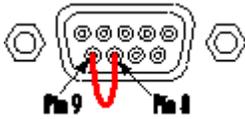
2 Factory Reset device to restore the default open authentication mode: reset the SoundStructure device and SoundStructure VoIP Interface by rebooting the SoundStructure device with pins 8 and 9 connected together on the RS-232 interface as shown in the figure. This will reset the SoundStructure device and SoundStructure VoIP Interface to a factory fresh state. Approximately five seconds after rebooting the system, the cable shorting pins 8 and 9 on the RS-232 interface may be removed. The system will boot up into a factory reset state.

NOTE: Default system password reverts to "456". VoIP card settings can be retained by removing the VoIP card prior to reset.

SoundStructure Logs

● SoundStructure system logs indicate authentication enabled and authenticate command. Passwords are displayed as "****" in the log and command acknowledgements to prevent unintended disclosure

New Commands

API Commands and Parameters

● New "Authenticate" API command syntax: authenticate "username" "password" (Username must be "admin", password must be 'system password' set up in Authentication mode or default password "456")

Example default authentication command: authenticate "admin" "456"

➢ System Acknowledgement:

♦ **Correct:** authenticated

♦ **Incorrect** username or password response: error "authentication failed"

API Parameters and Descriptions

API Parameters	Description
auth_password	•Used to set the password for the system •Password 128 characters or less •Password sent as clear text without encryption
eth_auth_mode	•Set authentication mode to either 'open' or 'auth' •Open: TCP communication over port 52774, port 52775 is disabled. •Auth: TCP communication over port 52775, port 52774 is disabled.

API Parameters	Description
sys_num_auth_connections	•'sys_num_auth_connections ' returns the total number of Ethernet connections for which 'eth_auth_mode' is set to 'auth'
sys_num_open_connections	•Returns the total number of Ethernet connections for which 'eth_auth_mode' is 'open'
sys_num_connections	•Returns the total number of Ethernet connections to the system •Equal to the sum of : 'sys_num_auth_connections' + 'sys_num_open_connections'

More detailed information on the API parameters is available in the SoundStructure Design Guide Rev G, Chapter 12, and a complete list of API parameters is included in Appendix A. Additionally, all API parameters can be viewed in the web interface of the SoundStructure system.

Bug Fixes

SERF-609 Fixed an issue where the auto mixer information was not shared properly between devices when there were two or more SoundStructure devices linked together. The effect of this issue was that multiple microphones could be active at the same time for the same talker if one of the microphones were on the last device, the chairman mode could fail to operate properly or last mic mode could fail to work properly if the microphones of interest were on the last device in the system.

SERF-606 Fixed an issue where the Mute Indication status of HDX Table Mic did not get updated correctly after executing a power-on preset.

SERF-604 Fixed an issue that in rare cases caused EQ filters to be applied incorrectly

SERF-589 Fixed an issue where if a virtual channel group was defined where one or more of the virtual channel members did not exist it would cause the SoundStructure device to generate an assertion error and turn the front panel LED yellow until the system was rebooted.

Feature Implementations and Known Limitations

Polycom Touch Control

- Polycom Touch Control software does not currently support the authentication features introduced with SoundStructure Firmware version 1.6.0. If attempting to connect Polycom Touch Control to a SoundStructure System that has Authentication enabled an 'Unable to connect' error will be displayed on the Touch Control interface as shown in the following figure.

Polycom Touch Control Version 1.4

Polycom Touch Control software version 1.4 adds support for SoundStructure systems with the SoundStructure VoIP interface.

SoundStructure VOIP Interface UC Software 4.0.1

The SoundStructure VoIP Interface is pre-programmed with Polycom® UC Software version 4.0.1 for the SoundStructure VoIP Interface. For details on the latest features introduced with the Polycom UC Software version 4.0.1, see the Polycom UC Software 4.0.1 Release Notes.

The SoundStructure VoIP Interface is a native SIP interface for all SoundStructure systems. For detailed information on creating SoundStructure Designs with the SoundStructure VoIP Interface, see the new SoundStructure VoIP Interface chapter in the SoundStructure Design Guide from the Help menu in SoundStructure Studio version 1.7.

The SoundStructure VoIP Interface is configured and controlled via an updated set of SoundStructure API commands. For additional information on the SoundStructure Firmware and SoundStructure Studio releases, see the releases later in this file.

Feature Implementations and Known Limitations

Polycom Touch Control

- While the Polycom Touch Control software, version 1.2, can be paired with a SoundStructure system that includes the SoundStructure VoIP Interface, the Polycom Touch Control will not be able to control a SoundStructure VoIP Interface. A future software update for the Polycom Touch Control will be required to support the SoundStructure VoIP Interface.

Call Diversion

- There is no SoundStructure API for Call Diversion, or forwarding all calls under certain conditions. Call Diversion can only be configured with the Polycom Web Configuration Utility of the SoundStructure VoIP Interface under the **Settings > Lines** options. To enable this feature on a particular Line with the SoundStructure VoIP Interface, enter the extensions to forward the call to and set the **No Answer Timeout** to **0** as shown in the following figure and select **Save**. The SoundStructure VoIP Interface will reboot automatically and then the settings will be active.
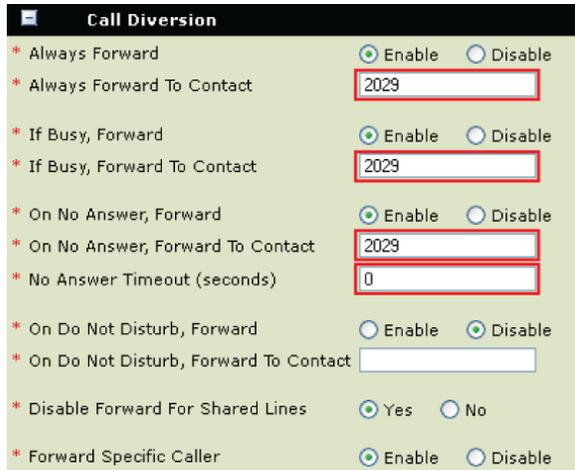
Do not disturb parameter affects all line registrations

- Setting Do Not Disturb (DND) with the SoundStructure API command voip_dnd will set all line registrations to DND mode, regardless of the settings in the voip configuration files that may exist on a provisioning server.

Custom Ring tones not supported

- The SoundStructure VoIP Interface does not support using the Web Configuration Utility option Preferences > Ringtone to load custom audio files for ringtones. The SoundStructure VoIP Interface can use any of the 13 standard ringtones that are included with the SoundStructure VoIP Interface including Low Trill, Low Double Trill, Medium Trill, High Trill, High Double Trill, Highest Trill, Highest Double Trill, Beeble, Triplet, Ringback-style, Low Trill Precedence, Ring Splash.

PTT / Paging is not supported

- The SoundStructure VoIP Interface does not support the PTT / Paging functions that are present in the UC Software 4.0.1. The PTT/Paging settings are not present on the Web Configuration Utility.

Private Lines are supported, Share Lines are not supported

- The SoundStructure VoIP Interface supports private lines (the default option for line type) but does not support shared lines.

No Microsoft Lync Support

- The SoundStructure VoIP Interface does not support the Microsoft Lync integration features found in UC Software 4.0.1.

Language selection in the Web Configuration Utility

- Changing the language of the SoundStructure VoIP Interface via the Web Configuration Utility only affects the language of messages in the Phone UI Messages field on the Phone Settings page as shown in the following example. The SoundStructure Studio UI is available only in English.

SoundStructure Firmware 1.5.0 Release Notes

SoundStructure Firmware version 1.5.0 is a SoundStructure device firmware release that includes support for the SoundStructure VoIP Interface and is intended to be used with SoundStructure Studio 1.7.0.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web site. The contents of this checksum file are shown below.

```
9203c38397784a3d412fc9f8d3436385d8398c27 firmware-1.5.0.bin
```

New Features

SoundStructure VoIP Interface Support

- Includes support for the SoundStructure VoIP Interface including a number of new parameters for configuring and controlling the SoundStructure VoIP Interface. See the table of new commands below and see the commands and command examples by pointing your web browser to the IP address of your SoundStructure device.

- Expanded the definition of existing parameters including fader, mute, `phone_ring`, `phone_connect`, `phone_dial`, and other parameters to be compatible with the new VoIP Telephony virtual channel definition.

- Added a summary of the SoundStructure VoIP Interface settings to the end of the SoundStructure device log as shown in the following table.

VOIP Plug-In Card Parameters

```
            voip_board_info 3111-33215-001 Rev=2 Region=0, MAC=00:04:F2:BF:00:1D
       voip_bootblock_sw_ver 3.0.3.0012 (33215-001) 07-Oct-11 08:39
         voip_bootrom_sw_ver 5.0.1.9444 16-Nov-11 04:33
             voip_uc_sw_ver Mink 4.0.1.11697 16-Nov-11 02:47 file sip.ld
         voip_dhcp_boot_serv     custom_opt66
     voip_dhcp_boot_serv_opt              160
    voip_dhcp_boot_serv_type           string
    voip_dhcp_option_60_type     ascii_string
    voip_eth_settings [mode]             dhcp
    voip_eth_settings [addr]     10.240.3.141
     voip_eth_settings [dns] 172.22.1.1 172.22.1.2
      voip_eth_settings [gw]       10.240.3.1
      voip_eth_settings [nm]     255.255.255.0
           voip_eth_vlan_id              240
       voip_prov_serv_address     10.240.40.210
          voip_prov_serv_type              ftp
          voip_prov_serv_user          PlcmSpIp
                 voip_status               ok
```

New Commands

- This version of software adds new API commands that can be viewed by browsing into the SoundStructure device or by reviewing Appendix A of the SoundStructure Design Guide. Examples of how to use some of the new commands are described in the SoundStructure VoIP Interface Chapter of the SoundStructure Design Guide. For reference, the list of new commands is shown in the following table.

API Parameters and Descriptions

Heading	*Heading*
phone_dial_backspace	Deletes a previously dialed digit.
phone_ignore	Causes the incoming call to be ignored. The incoming ringtones will be silenced on the local side.
phone_reject	Rejects an incoming call.
pstn_dtmf_tone_duration	Sets the duration in milliseconds of the tone generated for each DTMF digit.
sys_devices_match	Reports whether the system devices match the stored configuration.
sys_plugins_match	Reports whether the system plug-in cards match the stored configuration.
voip_answer	Used to answer an incoming call.
voip_blind	Used with voip_transfer to make a blind transfer.
voip_board_info	Returns manufacturing and hardware information about the plug-in card.
voip_bootblock_sw_ver	Returns the bootblock version of the plug-in card.

Heading	*Heading*
voip_bootrom_sw_ver	Returns the bootROM version of the plug-in card.
voip_call_appearance	Selects the currently active call appearance. Some parameters operate on the currently active call appearance. This is similar to pressing a call appearance on a desktop phone.
voip_call_appearance_info	Reports textual caller-id information for the specified call appearance.
voip_call_appearance_line	Reports the line number associated with the specified call appearance.
voip_call_appearance_state	Reports the state of the specified call appearance. Examples states include 'connected', 'ringback', 'disconnected', and others.
voip_cancel	Used to cancel a transfer or a conference.
voip_conference	Used to start a conference call.
voip_dhcp_boot_serv	Controls the boot server option for the plug-in card.
voip_dhcp_boot_serv_opt	When voip_dhcp_boot_serv is set to custom, this parameter specifies the DHCP option number in which the plug-in card will look for the boot server.
voip_dhcp_boot_serv_type	When voip_dhcp_boot_serv is set to custom, this parameter specifies the type of the DHCP option in which the plug-in card will look for the boot server.
voip_dhcp_option_60_type	Specifies the format for the vendor identifying information used with a DHCP server when DHCP option 60 is enabled.
voip_dial_mode	Selects between number dialing and SIP URL dialing.
voip_dnd	Enables or disables the Do Not Disturb mode on all lines.
voip_eth_settings	Sets or gets the Ethernet settings for the plug-in card.
voip_eth_vlan_id	Sets or gets the VLAN ID for the plug-in card. A value of -1 corresponds to no vlan id.
voip_factory_reset	Resets the plug-in card to its factory state.
voip_forward	Used to forward a call.
voip_hold	Places the current call on hold.
voip_join	Creates a conference from two calls.

Heading	*Heading*
voip_line	Selects a line. This is similar to pressing a line key on a desktop phone.
voip_line_label	Reports the label for the specified line.
voip_line_state	Reports the state for the specified line, e.g., registered, not registered, active, conference, hold, etc.
voip_local_reset	Resets all the voip parameters that SoundStructure Studio can set (ring type, auto answer, etc.).
voip_message_waiting	Indicates whether voice mail messages from any registered lines are waiting for the voip interface.
voip_net_cfg_save	Causes the VoIP network settings to be written to the flash memory.
voip_prov_serv_address	Sets the address of the provisioning server for the VoIP interface.
voip_prov_serv_password	Sets the password for the provisioning server for the VoIP interface.
voip_prov_serv_type	Sets the type of provisioning server for the plug-in card.
voip_prov_serv_user	Sets the username for logging into the provisioning server.
voip_reboot	Reboots the SoundStructure VoIP Interface
voip_resume	Resumes a call that was on hold.
voip_send	Causes a call to be placed with the digits dialed.
voip_split	Splits all calls in a conference into individual calls.
voip_status	Indicates the status LED state on the plug-in card.
voip_transfer	Used to transfer a call.
voip_uc_sw_ver	Gets the VoIP Interface UC Software version.

New Behaviors for run command and phone_connect and phone_dial parameters

- This version of software adds an immediate API acknowledgment run "Preset Name" where Preset Name is the name of the preset to be executed. As an example, when a control system executes a command to run a preset as shown next, the system will respond with an immediate run acknowledgment and then after the preset has finished executing, the system will respond with the standard ran preset acknowledgment.

APU Acknoledgment Run Preset Name

```
run "Preset Name"
run "Preset Name"
...
ran "Preset Name"
```

This new run acknowledgment provides immediate feedback that a preset execution has begun. Once the preset has finished executing, the 'ran "Preset Name"' acknowledgement is generated like with previous versions of firmware. The new *run* acknowledgment allows a control system programmer to indicate to the user that a preset is running. For example, the control system programmer could disable the preset button until the preset *ran* acknowledgment has been received to prevent the user from executing the preset multiple times due to the previous absence of visual feedback.

● Added new functionality to the `phone_dial` and `phone_connect` commands where a telephony interface (analog TEL1 or TEL2 or the VoIP Interface) will be dialed if the phone is taken off-hook within 20 seconds of dialing digits. After 20 seconds, the digits will be discarded. In previous versions of SoundStructure Firmware, if digits were dialed with the phone_dial command before the phone was taken off-hook, the digits were discarded.

● Finally, the parameter `pstn_dtmf_tone_duration` has been added to presets to allow changing the default length of the DTMF tone duration (100msec) for analog telephony interfaces (TEL1 and TEL2) and have those settings stored permanently in the SoundStructure device. Because there is no SoundStructure Studio UI to adjust this value, you will need to set the value manually from the SoundStructure Studio data console. To do this, open the console by right clicking on the project name and select console as shown in the following figure.
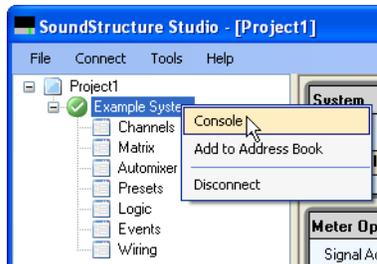
Once the console is open, type in the command below and press send as shown in the following figure.

```
set pstn_dtmf_tone_duration "Phone Out" 300
```
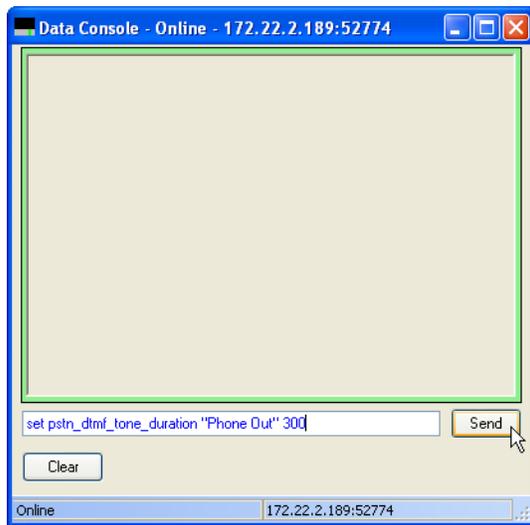

The system will respond with the acknowledgment below

```
val pstn_dtmf_tone_duration "Phone Out" 300
```

as shown in the following figure of the console window. To make this change survive a power cycle, save the settings to the power-on preset.
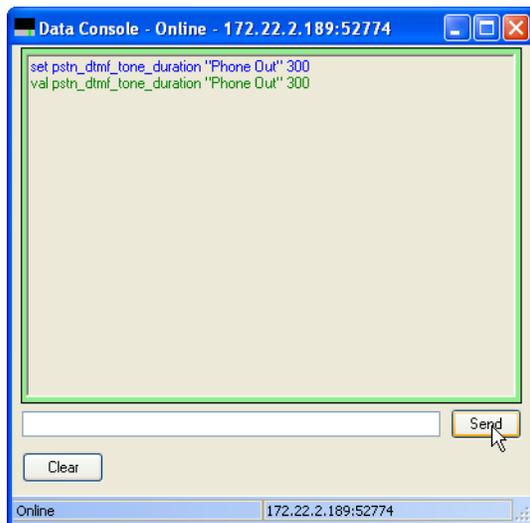
Yellow Front Panel Light Behavior

- This version of software changes the SoundStructure system behavior when there is a mismatch between the configuration file and the type or number of plug-in cards installed in a system. With previous firmware versions, any mismatch between the telephony cards installed in the system and the telephony cards specified in the configuration file would cause the system to have a yellow front panel LED and the system would appear to have an empty configuration file and consequently would not pass audio.

  With the new behavior, a SoundStructure system that has a mismatch between a plug-in card and a configuration file will continue to run the existing configuration file and pass audio but will not be able to use any of the plug-in card resources. To indicate this condition, the front panel LED will still be yellow when there is a mismatch between plug-in cards and the configuration file.

  When connecting to the system with SoundStructure Studio to get the configuration file, the Upgrade Plug-in tool will launch automatically to allow the user to correct the telephony plug-in card mismatch.

Factory Reset

- Added the ability to factory reset the SoundStructure device and a SoundStructure VoIP Interface by rebooting the SoundStructure device with pins 8 and 9 connected together on the RS-232 interface as shown in the figure. This will reset the SoundStructure device and SoundStructure VoIP Interface to a factory fresh state. Approximately five seconds after rebooting the system, the cable shorting pins 8 and 9 on the RS-232 interface may be removed. The system will boot up into a factory reset state.
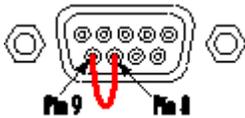
Muted Microphones, NOM, and Gating Indicators in the Automixer

- This version of firmware changes the behavior of the auto mixer so that a microphone that is muted at the SoundStructure input (using the mute parameter) will no longer count against the Number of Open Microphones (NOM) limit. This means that if the auto mixer NOM is set to 1, a muted microphone will no longer prevent a different talker from gating on a different microphone while the original talker is still speaking into their muted microphone. In addition, a microphone with a local talker speaking into the microphone will no longer appear to be gated when the microphone is muted.

- Remaining consistent with previous versions of firmware, if a local talker is speaking into a muted microphone, the auto mixer will not gate on a different microphone that may also be picking up the local talker. This auto mixer feature, included in the initial release of SoundStructure Firmware, enables private side-bar conversations where a local talker can mute their microphone and not have a different microphone gate on and transmit their side-bar conversation. This assumes that the local muted microphone is the microphone that would normally gate on if the microphone were unmuted.

Bug Fixes

SERF-368 Fixed an issue where SoundStructure device log files could be concatenated out of order so the timestamps show a discontinuity.

SERF-482 Fixed an issue where if phone_ignore command was issued while the phone is in ringing state, the phone would remain in the ringing state.

SERF-499 Fixed an issue where autoanswer could still answer the phone even if phone_ignore was issued.

SERF-360   Resolved an issue where SoundStructure devices under rare cases could stop operating unexpectedly due to a kernel issue.

SERF-367   Fixed an issue where in rare cases after a power cycle it would be possible for not all HDX microphone elements to be discovered in the proper order until the Clink microphones were unplugged and re-plugged into the SoundStructure device.

SERF-250   Fixed an issue where under in rare cases the analog telephony transmit signal was muted to the remote site because the line echo canceller was suppressing the transmit signal until the line echo canceller converged. With this fix, in these rare cases, the transmit signal path will be unmuted within 8 seconds of the call being connected.

SoundStructure Studio 1.7.0 Release Notes

SoundStructure Studio version 1.7.0 is a release that includes support for the SoundStructure VoIP Interface.

New Features

SoundStructure VoIP Interface Support

- Added support for designing projects with the SoundStructure VoIP Interface. Similar to the analog telephony channels the SoundStructure VoIP Interface is represented by an input virtual channel and an output virtual channel and has physical channel types of `voip_in` and `voip_out`, respectively.

- Added the ability to set the network settings of the VoIP Interface from SoundStructure Studio and added VoIP status information to the SoundStructure Studio wiring page.

  See the updated SoundStructure Design Guide (revision F), Chapter 12 for detailed information on how to design a project with the SoundStructure VoIP Interface. The design guide is available under the Help menu within SoundStructure Studio.

Phone Settings Page

- Updated the Phone Settings dialog on the Channels page to emulate a Polycom SoundPoint IP desktop phone for dialing new calls, placing calls on hold, transferring calls, and conferencing. Up to 12 line registrations can be configured and shown on the Phone Settings page. The Phone Settings user interface can aid in learning to use the new VoIP API commands by opening the SoundStructure Studio data console and observing the output as the interface is used.

Upgrade Plug-in Card Tool

- Added an Upgrade Plug-in card tool that simplifies transitioning a SoundStructure project with TEL1 or TEL2 plug-in cards to a SoundStructure VoIP Interface. The Upgrade Plug-in card tool supports changing from any set of SoundStructure plug-in cards to any different set of plug-in cards. See the SoundStructure VoIP Interface chapter of the SoundStructure Design Guide for information on how to use the Upgrade Plug-in Card tool. The Upgrade Plug-in card tool may be accessed from the Tools menu or from the Wiring page.

  The upgrade plug-in card tool is also automatically used when connecting to a system that has a yellow front panel light due to a plug-in card mismatch with the configuration file and will convert the project to match the underlying installed hardware.

Preset Run Status

- Added a status update on the lower left of the SoundStructure Studio page to indicate when a preset is running. This corresponds to the new preset command acknowledgment of run <Preset Name> that indicates that a preset execution has been initiated. Once the preset finishes executing, as indicated by the ran <Preset Name> acknowledgment, the preset indicator on SoundStructure Studio is no longer displayed.

Bug Fixes

IVBS-797   Fixed an issue where after adjusting a parameter via a combo-box, such as ungated type, the safety mute button did not send a safety_mute command until it was clicked 3 times.

IVBS-773   Fixed an issue that made it difficult to click and hover to edit address book entries.

IVBS-771   Fixed an issue where SoundStructure Studio did not display an error message when renaming an existing event to an existing name. The event would not be renamed but there was no indication that it was not renamed.

IVBS-769   Fixed an issue where SoundStructure Studio could unexpectedly close when trying to edit an event with an invalid range trigger value.

IVBS-731   Fixed an issue where SoundStructure Studio sometimes fails to update the feedback eliminator frequencies dynamically on an online system.

IVBS-588   Fixed an issue where digital_gpio_state could not be selected as an event source for a logic output unless a logic input is defined.

IVBS-661   Fixed an issue when closing an RS232 interface that may have already been closed due to the PC sleeping/hibernating or a USB-RS232 adapter being removed from the PC.

IVBS-662   Fixed an issue where SoundStructure Studio could not show the value option for a logic array with only one pin defined.

IVBS-615   Fixed an issue where selecting File Save and saving settings to the desired preset would overwrite the Power on preset, not the preset you had indicated.

SoundStructure Firmware 1.4.0 Release Notes

SoundStructure Firmware version 1.4.0 was reserved for an internal release and was not released to customers. The next released version of SoundStructure Firmware is version 1.5.0.

SoundStructure Studio 1.6.0 Release Notes

SoundStructure Studio version 1.6.0 was reserved for an internal release and was not released to customers. The next released version of SoundStructure Studio is version 1.7.0.

SoundStructure Studio 1.5.0 Release Notes

SoundStructure Studio version 1.5.0 is a release that includes support for using the Polycom Touch Control with a SoundStructure system.

New Features

- Added support for up to four Polycom Touch Control devices to be added to a SoundStructure project to be used as a controller for SoundStructure audio conferencing applications. The Polycom Touch Control can be 'paired' with either a Polycom HDX system, or with a SoundStructure system. Only one Polycom Touch Control needs to be added to a SoundStructure Studio project to support pairing with multiple Polycom Touch Controls with a SoundStructure system.

  See the SoundStructure Design Guide (revision E), Chapter 11 for detailed information on how to design a project with a Polycom Touch Control and how to integrate the Polycom Touch Control with the SoundStructure System.

  See the User's Guide for the Polycom SoundStructure Systems and the Polycom Touch Control Device for detailed information on how an end-user will interact with the Polycom Touch Control to control a SoundStructure system.

- Changed the UI display for `digital_gpio_held` on the events page to show true/false rather than open/closed.

- Changed the 'red' status LED range on SoundStructure Studio's wiring page for phantom power voltages to only illuminate red when the phantom power is less than 44V. Any voltage value of 44V and above is a valid phantom power voltage reading.

- Changed the UI for the Signal Generator on the wiring page to show only one virtual channel associated with the first device in a system. As with previous versions, only one signal generator may be part of a system and now the wiring page properly reflects that.

Bug Fixes

- Fixed an issue where SoundStructure Studio would close unexpectedly when editing an event that used `phone_flash` or `phone_redial`.

- Fixed an issue where SoundStructure Studio could not show the logic input or output array status properly on the logic page if the array value was larger than 9999

- Fixed an issue where the system could add only the 'in' channel of the headset interface adapter if there were no available output channels.

- Fixed an issue where selecting a filter from the EQ page for a virtual channel group would enable the EQ filters for all the channels in the virtual channel group, regardless of whether the EQ filters were previously enabled for a particular virtual channel. This could result with a virtual channel having more filters enabled than required with the additional filters operating with a flat frequency response.

SoundStructure Studio 1.4.1 Release Notes

SoundStructure Studio version 1.4.1 is a maintenance release that improves the usability of the SoundStructure Studio user interface and resolves a number of issues including unexpected program closures under various circumstances.

Bug Fixes

- Fixed an issue where the Add/Edit Event dialog box did not show all buttons on Chinese language PC's.

- Fixed several issues with the project conversion wizard including

> ➢ A conversion of a project for one set of devices to another set of devices with one or more HDX microphones may have microphone elements removed from the converted project.

> ➢ A conversion of project from a system with a TEL2 card to a system with a TEL1 card could cause SoundStructure Studio to terminate unexpectedly.

- Fixed an issue where it was required to save an online project prior to being able to execute a preset when the Run button was pressed if virtual channel names or virtual group names had been changed since the last time the project was saved.

- Fixed numerous issues that could cause SoundStructure Studio to close unexpectedly while using the preset recorder, events editor, channels, and matrix pages.

- Fixed an issue where SoundStructure Studio could not create a logic array with more than 27 pins.

- Fixed an issue where SoundStructure Studio could not create default call active and call inactive presets for an offline project with an HDX codec and analog microphones.

- Fixed several issues related to automatic event creation including when using push to talk microphones and Toggle All Mics Mute.

- Fixed an issue where odd orders were allowed for Linkwitz-Riley filters. Only even order filters are now allowed.

SoundStructure Firmware 1.3.3 Release Notes

SoundStructure Firmware 1.3.3 is a patch release that fixes several issues as described below.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web site. The contents of this checksum file are shown below.

`0bd08cdee082558877622331ea7b90521fc83048 firmware-1.3.3.bin`

Bug Fixes

- Fixed an issue where querying the state of an empty virtual channel group (e.g., get mute "Mics" when "Mics" is a virtual channel group with no members) would cause an assertion that would turn the master SoundStructure device's front panel light yellow and cause the system to stop responding to both API commands and SoundStructure Studio until the system was rebooted.

- Fixed an issue where it was not possible to enable the AMX beacon without causing the SoundStructure device's firmware to become unresponsive.

- Fixed an issue where log messages were not formatted properly for command buffer overflow messages.

- Fixed several issues with logic arrays including allowing more than 27 pins to be defined, and properly mapping the event action when large logic arrays are used.

SoundStructure Studio 1.4.0 Release Notes

SoundStructure Studio 1.4.0 is a major release adding a partial preset recorder capability and support for the Polycom Headset Interface adapter.

SoundStructure Studio version 1.4.0 is recommended for use with all SoundStructure designs regardless of the target firmware of SoundStructure devices. There is no minimum firmware version required to take advantage of the features within SoundStructure Studio 1.4.0.

New Features

The new features of SoundStructure Studio version 1.4.0 are introduced below. For detailed information on using the new SoundStructure Studio, see the SoundStructure Studio 1.4 primer document that is available on the Polycom website.

Preset recorder

- SoundStructure Studio 1.4 includes a preset recorder that allows one to create partial presets simply by starting the recorder and then using SoundStructure Studio's user interface to change the project settings. The results can be stored to a new partial preset or appended to an existing partial preset.

Headset interface adapter support

- The Polycom Headset Interface adapter, 2200-33206-001, has been added as an input/output option within SoundStructure Studio and can be easily added to a project and with all the SoundStructure Studio settings set appropriately.

Auto Route Option

- Added the option to not auto-route signals in the matrix when adding channels and creating projects. This option will retain its value between SoundStructure Studio sessions.

Command line argument

- Added support for the command line argument, -connect, to automatically connect to a system when Studio is launched. The connect option can accept an IP address or a serial port.

Automatically Generated Event Names

- Automatically created events names now begin with an underscore, "_", to differentiate the automatically created events from user defined events.

Event Copy Button

- Added an event copy button on the Events page to simplify creation of new events. An event can be copied by selecting the event and clicking the event copy button.

Improved wiring report

- Wiring report includes physical logic pin connection information.

Bug Fixes

- Fixed some UI issues where sorting events could cause the event under the mouse to have a white background and white font.
- Fixed an issue where renaming a stereo channel via the Edit Channels dialog did not update the wiring page correctly.
- Fixed an issue where MAC addresses were not sorted properly in the Connect to Devices control.
- Fixed an issue where if the SoundStation VTX1000 was the only remote audio source, the SR12 would be selected by default.
- Fixed several assertion errors that would cause SoundStructure Studio to close unexpectedly.
- Fixed an issue where removing a command from a full preset created a partial preset that would mute the system during execution and unmute when finished executing.
- Fixed an issue where after using the project conversion wizard the number of unused inputs for an SR12 was not calculated correctly.
- SoundStructure Studio now allows logic outputs to be used as event sources.

SoundStructure Firmware 1.3.2 Release Notes

SoundStructure firmware 1.3.2 is a patch release that fixes several issues as described below.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web site. The contents of this checksum file are shown below.

`9e8d427e83a322c17e46db006efe18c9c40f7017 firmware-1.3.2.bin`

Bug Fixes

- Fixed the following issue with SoundStructure systems that have two or more SoundStructure devices running version 1.3.0 or 1.3.1 firmware. In some cases after a large configuration file upload, or in rare cases after a preset execution, some parameters in the SoundStructure system could still have their default values (e.g., muted crosspoints or safety muted) even though SoundStructure Studio displayed the desired settings (e.g., unmuted crosspoints and not safety muted).
- Changed the behavior of the loop drop auto-hangup function to auto-hangup even if there is no phone line plugged into a telephony card.

SoundStructure Firmware 1.3.1 Release Notes

SoundStructure Firmware 1.3.1 is a patch release that corrects a difference in how virtual channel group acknowledgments are generated compared to earlier firmware versions.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web site. The contents of this checksum file are shown below.

`bfb1a41d51eb9cf474639fc76c04aff49718be2a firmware-1.3.1.bin`

Bug Fix

In version 1.3.0 firmware, acknowledgements from virtual channel group commands are not sent to secondary control connections. For example, if SoundStructure Studio were used to mute a virtual channel group, a control system also connected to the SoundStructure system would receive the proper mute acknowledgment for the individual channels in the group but would not receive the mute acknowledgment for the group name.

In addition, if a virtual channel group were used in a preset, or in the action of an Event, correct command acknowledgments would be generated for the individual channels in the group, but not for the group name.

This virtual channel group acknowledgment behavior difference could affect the status of a control touch panel display if the control system is expecting the acknowledgment from the virtual channel group name.

SoundStructure Studio 1.3.0 Release Notes

SoundStructure Studio 1.3.0 is a major release adding new Events and logic input/output functionality to support the SoundStructure 1.3.0 firmware release (See Section 0 for SoundStructure 1.3.0 firmware details).

It is recommended to use SoundStructure Studio version 1.3.0 for all SoundStructure project designs regardless of the target firmware of SoundStructure devices.

New Features

The new features of SoundStructure Studio version 1.3.0 are introduced below. For detailed information on using the new SoundStructure Studio and firmware 1.3.0 features, see Chapter 9 in the revision D, or later, SoundStructure Design Guide. The SoundStructure Design Guide may be found from the help menu in the version 1.3 SoundStructure Studio software.

Events

- SoundStructure Studio version 1.3.0 introduces the Events page for creating and editing events. Events are a very flexible way to cause specified actions to occur based on a source and a trigger and are used to connect logic input pins to control settings within SoundStructure such as executing presets based on logic pin changes, or muting microphones based on a button push. Events are also used to integrate the HDX IR remote controller with a SoundStructure device, allowing the different key presses to execute functions within SoundStructure such as taking the PSTN interface offhook, dialing digits, or muting microphones.

Integrated support for push-to-talk microphones

- SoundStructure Studio includes automated support for creating projects with push-to-talk microphones through the new logic input mode and logic output mode options available on the edit channels page. It is possible to add up to 128 push-to-talk microphones and their associated LED indicators at the same time the microphones are added to the project. Push-to-talk microphones are supported by SoundStructure events and all the events are created automatically as the microphones are added to the project.

HDX/SoundStructure integration uses Events

- The SoundStructure integration with HDX no longer requires the names "Mics" and "Amplifier" as the integration behavior is implemented with Events that may be customized. These events are added automatically when an HDX video codec is added to a project. These events allow bi-directional control between a SoundStructure system and an HDX video codec system. This allows the SoundStructure system to mute an HDX video codec and have the mute icon displayed on the video display.

HDX IR remote support added

- SoundStructure Studio supports adding an HDX IR remote to a project and automatically creates the events required to support the different IR key presses.

Configurable Peak Hold Meter

- SoundStructure Studio supports different options for the Peak Meter including a One second peak hold, Peak decay, and Infinite hold until the peak is reset.

Logic

- The new logic page is used for viewing the current status of defined logic input and output pins, and for changing parameters such as the `digital_gpio_hold` and `digital_gpio_repeat` times and the logic pin names. There is a new Edit Logic interface for defining digital logic input pins and arrays, digital logic output pins and arrays, and analog logic input pins.

Last run partial preset

- Added last run partial preset to the bottom status bar of SoundStructure Studio.

Windows Vista and Windows 7 Support

- Added support for Windows Vista and Windows 7.

Bug Fixes

- Fixed an issue where the matrix page would appear much smaller than the overall screen size when large fonts were used or with certain foreign language versions of Windows.

- Fixed an issue where SoundStructure devices running 1.1.5 firmware could not be discovered over RS232 with SoundStructure Studio 1.2.1.

- Fixed several file transfer time outs during large configuration setting transfers.

- Fixed an issue where if a telephone line had been auto-hungup due to loop drop detection, then when the phone was taken offhook with SoundStructure Studio, the last telephone number dialed would be dialed again.

- Fixed an issue where some crosspoints were not selectable until a different crosspoint was selected at which point the first crosspoint could be selected again.

- Fixed an issue where selecting two Polycom HDX video codecs for a project would not fully route the audio between the video codecs.

- Fixed an issue where changing the name of a virtual channel group would not change the original virtual channel group name used in partial presets to the new name.

- Fixed cases where the edit devices wizard would change the wiring of the system when only the presence of a TEL card was the difference from the designed project and the target hardware.

- Fixed an issue where deleting and rearranging HDX microphones on the wiring page would cause the microphone green dots indicators on the wiring page to become unsequenced.

SoundStructure Firmware 1.3.0 Release Notes

December 15, 2009

SoundStructure Firmware 1.3.0 is a major release adding significant new functionality to SoundStructure systems, numerous performance improvements, and several bug fixes.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web/ftp site. The contents of this checksum file are shown below.

a7d7818ce34028d14973d7a8039a5a5e9ada2e90 firmware-1.3.0.bin

New Features

The new features of SoundStructure Firmware version 1.3.0 are introduced below. For detailed information on using the new SoundStructure Studio and Firmware 1.3.0 features, see Chapter 9 in the revision D, or later, SoundStructure Design Guide. The SoundStructure Design Guide may be found from the help menu in the version 1.3 SoundStructure Studio software.

Events enable Logic input and output pins and the HDX IR Remote

SoundStructure Firmware version 1.3.0 introduces the concepts of Events where events can be used with logic input pins to execute SoundStructure commands including executing presets or setting the value of logic output pins.

Added new parameters digital_gpio_held, digital_gpio_hold_time, and digital_gpio_repeat_time to add more options for using the logic input pins.

The HDX IR remote, with the addition of external IR receiver that connects to the SoundStructure rear panel, may be used to control SoundStructure devices with events. Key presses on the IR remote can cause events to execute commands on SoundStructure allowing full control of a SoundStructure telephony interface.

Zero Configuration Network Support

SoundStructure devices running version 1.3 firmware will default to the link-local IP address of 169.254.1.1 if the SoundStructure is configured for DHCP and there is no DHCP server available to provide an IP address when the SoundStructure device powers up. This makes it possible to connect to a computer directly to a SoundStructure device with either a straight-through or crossover Ethernet cable without either having to set a static IP address or having a DHCP server available.

10 New Ring Tones

10 new ring tones have been added to the SoundStructure telephony interface. The ring tones are selected with the new SoundStructure parameter phone_ring_tone. The default ring tone is the traditional phone ring tone (phone_ring_tone = 1)

Autohangup based on Call Progress Tones

SoundStructure Firmware version 1.3 includes the ability to automatically hang up any of the SoundStructure PSTN phone interfaces based on the call progress tones of busy, fast busy, and offhook. There is a new SoundStructure parameter, pstn_auto_hangup_call_prog_en, that enables or disables this functionality. The default value is disabled.

Serial port broadcast mode

SoundStructure Firmware version 1.3 includes a broadcast mode for the serial port that allows the SoundStructure device to send commands to other devices. The serial port may be in one of two modes – command or broadcast. The default mode for the serial port is command mode. Command mode is compatible with third party control systems such as AMX and Crestron and allows the SoundStructure system to be fully controlled or configured. Broadcast mode allows the SoundStructure device to send arbitrary commands from the selected serial port to control other devices. When in broadcast mode, any data received on the serial port is ignored.

Pause the command processor

SoundStructure Firmware version 1.3 adds a new parameter, sys_pause, that pauses the system's command processor for the specified number of milliseconds. This means that any commands that are sent to SoundStructure from a control system or from SoundStructure Studio will be queued up and not executed until the sys_pause time has passed. The parameter sys_pause can be used to add delays in the command processing system. For example, to create a one second tone burst, a partial preset could be created that unmutes the signal generator to an output, pauses for one second, and then mutes the signal generator

Signal Activity Meter

SoundStructure Firmware version 1.3 includes a signal activity meter. This meter can be used as a source with the events engine. The threshold for the signal activity is set for all audio channels at once with the signal_activity_thresh parameter.

Version 30 HDX Microphone Firmware

SoundStructure Firmware version 1.3 includes the version 30 firmware for the Polycom HDX microphones. Version 30 firmware makes more efficient usage of the microphone resources and reduces the power requirement of the HDX microphones. Updating the SoundStructure Firmware to version 1.3 will automatically cause HDX table and ceiling microphones that are connected to the SoundStructure device to

be updated if there is no HDX video codec connected to the SoundStructure device over conference link. Current HDX video codec firmware releases include version 30 firmware.

Support for 40 ft OBAM cables

OBAM has been improved to support 1394b Beta cables with lengths of up to 40ft. Standard high quality 1394b Beta cables may be used with SoundStructure. A 40ft OBAM cable is now available from Polycom with part number 2200-43229-001.

Faster Preset Execution

The execution speed of both partial presets and full presets has been significantly improved. Partial presets may be used more efficiently now for volume control, changing routing settings, and other simple changes to the system. Full presets execute faster on SoundStructure systems.

Reduced boot time

SoundStructure systems built from either single devices or large multi-device systems will finish the boot process in under two minutes.

Static IP address improvements

Static IP addresses of SoundStructure devices now remain with the device regardless of whether a device has been OBAM linked with other devices or has a configuration file that doesn't match the hardware (yellow front panel LED state).

Stereo linking for dynamics and AGC

Stereo virtual channels now have the dynamics and AGC processing of both left and right channels linked together to ensure the stereo image is not affected by gains applied to the underlying left and right channels.

Synchronized clink mute state

Using SoundStructure events and the new SoundStructure parameter clink_mute, the clink mute state can be synchronized across multiple SoundStructure devices that are linked with OBAM. This ensures that the status LED light on HDX table microphones are synchronized across multiple SoundStructure devices.

'online' RS232 acknowledgment upon power up

When the SoundStructure device has finished booting, the string "online" will be sent out the serial port interface to indicate the system has finished booting. This can be used by a control system that is connected over RS232 as an indicator that it can now send commands to a SoundStructure system.

New API Commands

The following new parameters were added in the SoundStructure Firmware version 1.3. For detailed information about these new parameters, point your browser to the IP address of a SoundStructure device that is running version 1.3 firmware.

Command	Description
clink_call_active	Indicates whether there is an active video call on an HDX connected to the particular SoundStructure device.

Command	*Description*
clink_local_call_active	Can be used to indicate whether there is an active call (HDX video or SoundStructure PSTN) on a particular SoundStructure device. When clink_local_call_active is one or greater on a particular SoundStructure device, the HDX table microphone LEDs will illuminate green on that device.
clink_mute	Controls the mute state on the conference link interfaces for the particular SoundStructure device. Controls the mute state for any HDX codecs that are connected to that particular SoundStructure device. When clink_mute is true for a given SoundStructure device, HDX table microphones connected to that SoundStructure device will illuminate red.
clink_volume	Controls the volume level on the conference link interfaces for the particular SoundStructure devices. This parameter may be used to map the volume from the HDX to a fader on SoundStructure.
digital_gpio_held	Specifies that the particular logic input pin has been held for the digital_gpio_hold_time in the closed position (digital_gpio_held = 1).
digital_gpio_hold_time	Specifies the amount of time that a logic input pin must be held before the first digital_gpio_held message is sent.
digital_gpio_repeat_time	Specifies the amount of time in milliseconds between digital_gpio_held messages when a button is continually held in the closed position (logic input switch closed = logic input value of 0).
ir_chan_id	Specifies the IR channel ID that the SoundStructure and IR remote transceiver use. This allows multiple IR transmitters and receivers to be used in the same room. Defaults to 3 which is also the default for the HDX IR remote.
phone_ring_tone	Selects the incoming telephone ring tone
pstn_auto_hangup_call_prog_en	Enables being able to automatically hangup the phone line based on tones from the central office or PBX when the remote party hangs up the telephone call.
ser_control_mode	Sets the serial port mode to be either in broadcast or command mode. Command mode is the default.
ser_send	Used to send arbitrary commands out the RS232 interface when the serial port is in broadcast mode.
signal_activity_thresh	Specifies the threshold for the signal activity meter.
sys_pause	Pauses the command processor for up to 5 seconds

Bug Fixes

- Removed the limitation where a valid Ethernet gateway address was required before a local PC on the same subnet could automatically discover a SoundStructure device using the Connect to Devices feature.

- Fixed an issue where the "Amplifier" fader was set to -30 upon power-up in the version 1.2.5 firmware.

- Fixed an issue where the automixer hold time could be set below 100msec. The minimum value is now limited to 100msec.

SoundStructure Firmware 1.2.5 Release Notes

October 2, 2009

SoundStructure Firmware version 1.2.5 is a maintenance release for improving OBAM linking performance of large multi-device systems, defined as systems with five or more devices. This version further increases the capacity of the SoundStructure devices to synchronize clocks between devices. In previous versions of firmware if a device lost OBAM link synchronization, the audio outputs on that device could become safety-muted on that particular device with output signal level shown but no audio heard due to the safety mute.

When linking multiple SoundStructure devices together for the first time with OBAM, it is recommended that all SoundStructure devices be updated to the same version of firmware. In an operational system consisting of multiple SoundStructure devices *already* linked together and operating with OBAM, the firmware of all the individual devices will be updated with one firmware transfer to the system – it is *not* necessary to unlink an existing multiple-device system to update firmware. If there is a control system sending commands to a SoundStructure system, it is recommended that the control system be disconnected during the firmware update process.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web/ftp site. The contents of this checksum file are shown below.

4dfc0a8c8cbd9136e111bf41c17104f863ed807a firmware-1.2.5.bin

SoundStructure Firmware 1.2.4 Release Notes

July 24, 2009

SoundStructure Firmware version 1.2.4 is a maintenance release that fixes several issues and improves the type of data logged and the formatting of the logged data.

When linking multiple SoundStructure devices together for the first time with OBAM, it is recommended that all SoundStructure devices be updated to the same version of firmware. In an operational system consisting of multiple SoundStructure devices *already* linked together and operating with OBAM, the firmware of all the individual devices will be updated with one firmware transfer to the system – it is *not* necessary to unlink an existing multiple-device system to update firmware. If there is a control system sending commands to a SoundStructure system, it is recommended that the control system be disconnected during the firmware update process.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded to verify the firmware file has been properly downloaded and matches the file on the web/ftp site. The contents of this checksum file are shown below.

ef28e7f296957836b03e25faa56dc61fbceea246 firmware-1.2.4.bin

New Features

Log Filters

Version 1.2.4 adds two parameters to the SoundStructure API - sys_cmd_log_en and sys_mtrreg_log_en. These parameters allow filtering the all command information and all meter registration and unregistration commands respectively out of the system logs. sys_cmd_log_en set to 0 will not store any API commands or API acknowledgements in the log. sys_mtrreg_log_en set to 0 will not store meter registration and unregistration (mtrreg and mtrunreg) commands in the log. These parameters default to 1 (on) which was the default behavior of previous firmware revisions.

Log Organization and Format

The organization and format of the logs changed to increase the amount of useful information that is captured in the logs. The logs now always have sections that have the original device boot messages, initial power-on preset messages, the current logs of the device, and detailed system information including temperatures, voltages, and firmware versions of all SoundStructure devices in a system. The current logs of the device include the latest information that has been executed. Setting sys_mtrreg_log_en to 0 will remove all meter registration and unregistration commands and setting sys_cmd_log_en to 0 will remove all commands and acknowledgements from the logs so the logs only include system messages.

Bug Fixes

- Version 1.2.4 increased the capacity of the SoundStructure devices to synchronize clocks between devices even when significant clock variances exist between devices. The result is an improvement in the robustness of OBAM on large multiple device installs. In previous versions of firmware if a device lost OBAM link synchronization, the audio outputs on that device could become safety-muted on that particular device with output signal level shown but no audio heard due to the safety mute.

- Changed the pstn_in_gain parameter to adjust the gain after the line echo canceller instead of before the line echo canceller. Now as much pstn_in_gain as required (up to +20dB) may be applied on the telephony input signal without concern for degrading the performance of line echo canceller. In previous versions of firmware adding more than +6 or +8 dB of pstn_in_gain could cause the line echo canceller to sound choppy.

- Fixed an issue where executing *full* presets while the telephone was offhook would cause the phone to be placed on hook and the call terminated.

- Fixed an issue where the SoundStructure cooling fans would occasionally increase in speed to their fastest rate and then revert back to the speed determined by the fan speed algorithm.

- Fixed an issue where, in rare cases, the automixer on a C8, C12, or SR12 may not operate properly due to erroneous gating information generated by the device that prevented microphones from gating on.

- Fixed an issue where any non-zero value for the priority attenuation would attenuate all microphones in the automatic microphone mixer, not just the microphones of lower priority.

- Fixed an issue where a SoundStructure system, in rare cases, could stop processing commands received from a control system when a significant number of commands and meter data were being transferred between a SoundStructure device and a control system. In previous firmware versions,

the device would still be operational and could be pinged over the network, but commands were not accepted preventing the system from being controlled.

- Fixed an issue where after power up of a SoundStructure C16, a tonal noise could, in rare cases, be present on inputs 15 and 16 and submix 15 and 16 when non-microphone inputs are connected to physical inputs 15 and 16. Configurations where the AEC is enabled on inputs 15 and 16 would never exhibit this issue.

SoundStructure Studio 1.2.1 Release Notes

SoundStructure Studio version 1.2.1 is an enhancement release that significantly improves the Edit Devices Wizard functionality, making it more transparent to upload a project designed for one set of SoundStructure devices to another set of devices. The Edit Devices Wizard improvements focused on minimizing any wiring changes by preserving physical channel layout and channel settings as much as possible.

In addition this version fixed UI issues as described in the following sections.

New Features

Edit Devices Wizard

- Made significant improvements to the Edit Devices Wizard to minimize any physical wiring changes when reconfiguring a SoundStructure Studio project from a source set of SoundStructure devices to a different target set of SoundStructure devices or with devices that have different telephony interfaces. Also added an option to review the modified project to review wiring, etc., before uploading the project when the Edit Devices wizard changes a project.

Windows 64-bit operating system support

- Added support for Windows 64-bit operating systems including Microsoft Vista.

IP address change workflow improvements

- Improved the workflow for changing the IP address of a system that the user is connected to over IP. If the IP address is changed, SoundStructure Studio informs the user it is necessary to reconnect to the system at the new IP address and save the configuration file to make the new IP address permanent. SoundStructure Studio automatically disconnects the session and shows the Connect to Devices user interface once the user hits apply to change the IP address if the user is connected over the existing IP address.

Firmware update warning over RS-232

- Added a warning if a user attempts to update firmware at 9600 bps using the RS-232 interface. Due to the length of time (several hours at 9600 bps) required to transfer the firmware file over RS-232, it is recommended that higher baud rates be used or, even better, use the Ethernet interface for firmware updates.

Project save work flow improvements

- The file save process checks to see if the current device settings match either the last saved preset or the last restored preset, and if so the user will not be prompted to save the settings to a preset. The file save mechanism also has changed to allow a user to save a project to disk without being forced to save the current settings to a preset if they didn't want to change the device settings but did want to save the project to disk.

Keyboard Dialing

- Added support for keyboard dialing of digits to the telephony interfaces with the SoundStructure Studio user interface. If the phone is onhook, any digits dialed are stored and can be edited by moving the cursor and using the backspace key. Once the phone is taken offhook, any digits that are present are dialed.

Added support for Israel country selection

- Added Israel to the list of supported telephony countries. Israel telephony support to the SoundStructure Firmware was added in the firmware version 1.2.1.

Known Limitations

When running the Edit Devices wizard on a multi-SoundStructure device project that includes multiple HDX microphones, the resulting project created by the Edit Devices Wizard should be reviewed before sending the project to the devices to ensure that there are no more than four HDX microphones per SoundStructure device and that all three HDX microphones elements from any given HDX microphone are on the same SoundStructure device. HDX microphones may be manually moved on the wiring page by clicking and dragging the microphones to a different SoundStructure device.

Bug Fixes

- Fixed an issue where HDX microphone elements could be mapped with an invalid `mic_source_index` in the configuration file. The effect was, in some cases, an HDX microphone would be present in the design but would not show any metering activity on the channels page until the microphone was removed and re-added to the system again. The effect could also appear as metering from some elements of one microphone (for example, 3 A) appearing as metering activity for the next microphone, (for example, 2 C).

- Fixed an issue with redrawing signal meter data information on the channels page where a group of channels could be collapsed and expanded and meter information not properly redrawn even though audio was present.

- Fixed an issue where adding an HDX table microphone could change the `mic_source_type` for an existing analog microphone of name "Table Mic".

- Fixed an issue that could cause a program exception during scanning for SoundStructure devices.

- Fixed an issue where Studio would continue refreshing the matrix page when requested to add more submixes than were available.

- Fixed an issue where keyboard up/down key press updates to the fader min or max caused the fader min/max values to be shown offset form the UI control.

- Fixed an issue where changing the reference from a stereo output or submix to mono output on the "Mics" group caused SoundStructure Studio to show <none> for the reference.

- Fixed an issue where the Edit Devices wizard did not properly update the RS-232 baud rate and IP addresses from the source SoundStructure devices to the target SoundStructure devices when changing the SoundStructure device configuration to match a different set of SoundStructure devices.

- Fixed an issue where the transfer of a SoundStructure device configuration file could time-out due to the configuration file taking longer than expected to transfer and run.

- Fixed an issue where the Recent Projects list was not updated to include new projects that are created and saved.

- Fixed an issue where the AEC reference names in the pull down combo box were not sorted alphabetically. The width of the AEC reference field has also been updated to expand as necessary to accommodate longer virtual channel names.

- Fixed an issue where the names in the Channels and Matrix page were not sorted properly if the name began with a numeric value instead of an alphabetic character.

- Fixed an issue where the matrix fader gain max and input or output signal fader max were not synced with the firmware if the fader max value was set to 0dB or lower.

- Fixed an issue where setting the first mono AEC reference to <none> forced the second mono AEC reference to <none>.

- Fixed an issue where swapping physical outputs could cause the virtual channels to lose virtual channel group membership.

- Fixed an issue where on some projects the telephony channels did not properly show the phone setting UI elements. SoundStructure Studio will now correct this issue if detected in a project file and the corrected settings will be saved when the user saves the project.

- Fixed an issue where changing the name of the signal generator on the channels page caused a matrix redraw issue that would cause SoundStructure Studio to prematurely close.

SoundStructure Firmware 1.2.3 Release Notes

Version 1.2.3 firmware is a maintenance release that fixes a rare initialization issue that could occur on some systems.

In addition to the firmware file, a sha1sum checksum of the firmware file may also be downloaded. You may optionally use this sha1sum checksum file to verify the firmware file has been properly downloaded and matches the file on the web/ftp site. The contents of this checksum file are shown below:

`b1cd90534d9af2b93944f52ef4ed69604fdc731a firmware-1.2.3.bin`

Bug Fixes

Fixed an issue when if a SoundStructure device is booted up and there is significant broadband noise present at microphone inputs, there was the possibility that there could be a low level audio buzz on some microphone inputs on some devices under the following conditions: the acoustic echo canceller is enabled, and the non-automixed Snd Reinforcement ungated signal type is used directly in the matrix without the use of an automatic microphone mixer.

SoundStructure Firmware 1.2.2 Release Notes

Version 1.2.2 firmware is a maintenance release that fixes several telephony issues and adds automatic logic input state acknowledgements.

New Features

Logic Input

- SoundStructure Firmware v1.2.2 includes support for automatically generating logic input state acknowledgements from analog and digital logic inputs connected to a SoundStructure device's logic ports. This means that a logic pin defined with the vcdef command will automatically generate an API command acknowledgement based on state changes of the pin.

The following example shows how to define a digital logic input on pin 1 named "button1".
```
vcdef "button1" control digital_gpio_in 1
```

In this example, when logic input 1 (pin number14) is shorted to ground (pin number 25) the system will automatically generate an acknowledgement of the form
```
val digital_gpio_state "button1" 0
```

When the pin transitions to not being shorted to ground, the system will automatically generate an acknowledgement of the form
```
val digital_gpio_state "button1" 1
```

Once the required pins are defined, save the configuration file to ensure the pin definitions are stored permanently in the SoundStructure file or device. Refer to the SoundStructure Design Guide found under the Help menu in SoundStructure Studio (Chapter 3) for additional examples of using the logic pins. Please note in this firmware release that an external control system is still required to execute SoundStructure commands for muting, preset changes, etc., based on logic state changes.

In previous releases, the command acknowledgement was not generated automatically requiring the pin state to be polled continuously by an external control system.

Bug Fixes

- Fixed an issue where random aperiodic audio popping could be present on some audio outputs with certain system configurations.

- Fixed an issue where the incoming telephone ring signal was not detected on some PBX's and central offices. This issue would prevent SoundStructure from knowing that the phone was ringing.

- Fixed an issue where the `phone_ring` acknowledgement was using the "Phone Out" virtual channel name instead of the "Phone In" virtual channel name. This release and firmware prior to 1.2.0 use the "Phone In" channel name with the `phone_ring` acknowledgement.

- Fixed an issue where the loop drop auto hangup functionality was not properly detecting loop drop signaling when the remote party hung up.

- Fixed an issue where it was possible to use the ' run "PresetName" ' syntax with preset names that were not defined. The system will now return an error message if an invalid preset name is specified.

- Fixed an issue with `phone_redial` where the redial digit buffer could contain more digits than stored from the last phone onhook usage.

SoundStructure Firmware 1.2.1 Release Notes

Version 1.2.1 firmware is a maintenance release that adds Israel as a valid telephony country code and also fixes several issues found in version 1.2.0.

New Features

PSTN Support for Israel

- SoundStructure Firmware includes pstn support for Israel. Because the currently released version of SoundStructure Studio does not list Israel as a country code option the country code value for Israel must be set manually via a SoundStructure API command as follows:
```
set pstn_country "Phone Out" israel
```

where "Phone Out" is the name of the telephony output channel. SoundStructure Studio will show this field as an empty value in the Phone Settings user interface. Once the setting has been made, save the settings to a preset to ensure they survive a power cycle.

Bug Fixes

- Fixed an issue on any SoundStructure device running 1.2.0 firmware where if an RS-232 data rate and flow control were set to values other than 9600 bps and none respectively, the RS-232 data rate and flow control settings would be reset to 9600 bps and none after any full preset was executed.

- Fixed an issue on a SoundStructure C16 running 1.2.0 firmware where a stereo echo canceller reference on input 16 would cause echo to be heard at the remote site if a microphone was defined on physical input 1 and routed to the remote site regardless of whether the microphone was physically connected.

- Substantially reduced the possibility of occurrence where, after power up of a SoundStructure C16 running 1.2.0 firmware, a tonal noise is present on inputs 15 and 16 and submix 15 and 16 when non-microphone inputs are connected to physical inputs 15 and 16. Configurations where the AEC is enabled on inputs 15 and 16 would never exhibit this issue.

- Fixed an issue where setting a static IP address on a SoundStructure device running 1.2.0 firmware on a multi-device system and not connecting a valid Ethernet connection to that device could, in some cases, cause SoundStructure Studio and the firmware to become out-of-sync with some parameter values such as matrix mutes after powering up a SoundStructure device.

- Fixed an issue where, in rare cases with eight SoundStructure devices running 1.2.0 firmware, the outputs and inputs on the 8th device may have intermittent pops on the audio.

Known Limitations

- If setting a manual (static) IP address, the gateway value must be configured in addition to the IP address and subnet in order for the device to be discovered with SoundStructure Studio. Without a gateway the device can still be manually connected to by typing in the IP address but it won't be automatically discovered by SoundStructure Studio unless there is a valid gateway address.

Using Version 1.2.1 Firmware

Review Chapter 7 of the SoundStructure design guide for full information on linking multiple SoundStructure devices with the OBAM interface.

To update firmware copy the firmware to your desktop or some other easy-to-find location. Using SoundStructure Studio, connect to the target system and left click on the System Name in the tree structure in the left pane of SoundStructure Studio. Click the Open button on the firmware update control to find and select the firmware file and then select Update to update the firmware for the system. The SoundStructure devices will reboot after their firmware has been updated.

Multiple device SoundStructure systems that are currently running version 1.2.0 firmware will have their firmware updated at the same time when the system firmware is updated.

If using firmware earlier than version 1.2.0 and it is desired to link multiple devices together, update each of the individual SoundStructure devices to version 1.2.1 before linking multiple SoundStructure devices together. See the firmware upgrade notes associated with the SoundStructure Firmware 1.2.0 release notes below for additional information.

SoundStructure Studio 1.2.0 Release Notes

SoundStructure Studio version 1.2.0 is a release that supports multiple-device linking with the OBAM interface for up to eight SoundStructure devices.

New Features

OBAM Support

- SoundStructure Studio includes OBAM support for designing systems with up to eight SoundStructure devices and 8 telco cards. The same design process is followed as building single device systems. In step 3 of the design process the required SoundStructure devices will be selected automatically based on the inputs and outputs added to the system. See Chapter 7 of the SoundStructure design guide (available under the Help menu option) for more detailed information on how to use the OBAM functionality.

SoundStructure Device Address Book

- An address book has been added to the Studio software to make it easy to store fixed IP addresses of devices to make it easy to connect to the devices. The address book is stored in an XML file and may be easily shared with other users or kept in a central location that multiple users can access. Appendix B of the SoundStructure Design guide includes more information on using the Address book.

Matrix View Enhancements

- The virtual channel names may now be changed directly from the matrix page. In addition the matrix output and input names are frozen on the page to make it easier to scroll through a large matrix. The Output names and Input name fields may be resized by clicking and dragging in the space between the virtual channel names and the faders.

Enhanced Signal Meters

- The signal meter display has been enhanced to make it easier to see when the signal levels reach 0dB. New peak and clip meters have been added. Meter refresh rate has been increased to improve responsiveness.

- Signal meters have been added to the matrix crosspoints and automixer pages.

Convert Project Wizard

- A new project conversion wizard makes it possible to take a design for a particular collection of SoundStructure devices and convert that design to use the devices discovered during the upload process (when working online) or an arbitrary device selection (when working offline). When the wizard detects that the target devices don't match the devices in the project, it will convert the project devices to match the target devices and will automatically re-wire the system to fit into the target devices. After the wizard has run, you should check your wiring to ensure it matches the physical wiring of the system.

Ethernet Address Confirmation

- Added a prompt for the designer when the IP address in the file to be loaded to the SoundStructure device is different from the IP address that is already associated with the device. This allows the user/designer to create one configuration file and upload to multiple SoundStructure systems and use the local IP address in the system rather than defaulting to the value of the Ethernet address in the configuration file.

Channels Page Scrolling Position

- The channels page scroll position is currently saved between page flips to allow the user to automatically return back to where they were scrolled on the Channels page before changing to a different page.

Fader Min and Max Controls

- Tool tips have been added to the fader min and max controls (the small triangles on the right of the fader) to make it easier to set the min and max volume controls that can be used to limit the amount of adjustment on any fader control.

Easier Access to the Phone Settings

- A phone onhook/offhook button and dialing buttons have been added to the phone in channels on the channels page to make it easy take the phone on and offhook.

Recently-Used File List

- Added a recently used file menu now to make it easy to find previously designed projects.

Enhanced File Save

- The File Save operation has been improved to ensure that the user is prompted to store any changes to the last saved or last run preset.

Disconnect from Devices

- Added the ability to disconnect from a project and become offline. Right click on the project name and then select Disconnect to stop communicating with the device. To reconnect you can send your project to the device or get the project back from the device.

Instant Designer updates

- Added the SoundStation VTX1000 as an analog telephony interface that may be used with SoundStructure devices.

Improved the Device Information view

- Improved the presentation of information on the device information portion of the wiring page with information of whether the temperature ranges and voltages are within the expected range (green), are at the edge of the expected range (yellow), or are outside the expected range (red).

Known Limitations

- The meters may briefly flash an erroneous signal level while scrolling on the channels page.

- Selecting a large number of crosspoints in the matrix and changing the crosspoint gains before receiving all the acknowledgements from a previous change can create a parameter value update loop which cycles between two or more values until the edit crosspoint dialog is closed. To avoid this issue, select individual crosspoints, small groups of crossoints, or wait for all values to change before further adjusting the same set of crosspoints.

SoundStructure Firmware 1.2.0 Release Notes

Version 1.2.0 firmware is a release that supports multiple-device linking with the OBAM interface for up to eight SoundStructure devices and supports the additional features in SoundStructure Studio 1.2.0.

New Features

OBAM Support

- SoundStructure Firmware includes support for linking multiple devices together with OBAM. See Chapter 7 in the SoundStructure Design guide for detailed information on creating and controlling multiple-device designs.

Bug Fixes

- Fixed an issue where the RS-232 port could stop operating if there was too much data transmitted to the SoundStructure over the RS-232 interface.

- HDX8000 and HDX7000 video codecs are shown as properly discovered on the wiring page. In previous versions these codecs were discovered but not shown as discovered.

- Feedback frequencies are now properly displayed on the feedback eliminator/equalization page.

Known Limitations

- If setting a manual (static) IP address, the gateway value must be configured in addition to the IP address and subnet in order for the device to be discovered with SoundStructure Studio. The device can still be manually connected to by typing in the IP address but it won't be automatically discovered by SoundStructure Studio unless there is a valid gateway address.

- In rare cases with eight SoundStructure devices the outputs and inputs on the 8th device may have intermittent pops on the audio.

API Changes

- In Version 1.2, the API commands `analog_gpio_min` and `analog_gpio_max` have been removed. The range on the `analog_gpio_value` parameter has been set to 0 to 255 and is no longer customizable with the min and max commands.

- The `dev_led_cycle` parameter has been added to make it possible to cycle the LED on the front panel of the SoundStructure device.

- The `sys_last_full_preset,` `sys_last_partial_preset`, and `sys_last_preset` parameters have been added to make it possible to query which presets were last executed.

Using Version 1.2.0 Firmware

Review Chapter 7 of the SoundStructure design guide for full information on linking multiple SoundStructure devices with the OBAM interface.

A summary of the required steps is shown below.

1 If the existing firmware in the SoundStructure devices is 1.1.5 or earlier, update the firmware in each of the SoundStructure devices separately to this version of firmware before linking devices with the OBAM interface.

If your SoundStructure devices already have an earlier 1.2.0-beta firmware version, all devices should be able to have their firmware updated at one time. If you experience any problems while updating firmware for the system when the systems have early 1.2.0-beta software, unlink the OBAM connection between the devices and update the firmware on the units separately.

To update firmware in your SoundStructure device, copy the firmware to your desktop or some other easy-to-find location. Using SoundStructure Studio, connect to the target device and left click on the System Name in the tree structure in the left pane of SoundStructure Studio. Click the Open button on the firmware update control to find and select the firmware file and then select Update to update the device. The SoundStructure devices will reboot after their firmware has been updated.

2   Once firmware has been updated in the individual devices, power down the devices, connect the OBAM link (OBAM Out on one device to OBAM In on the next device) as desired to link SoundStructure devices together, and power up the SoundStructure devices. If the SoundStructure devices were already linked due to having an earlier version of 1.2 firmware, it is not necessary to power down the devices.

3   Use the SoundStructure Studio 1.2 software to create project files for the SoundStructure Systems.

> A flashing green LED on a SoundStructure device's front panel indicates that the device is booting.

> A solid green LED on a SoundStructure device's front panel indicates that the SoundStructure device has a configuration file that is compatible with the devices the project is loaded on.

> A solid yellow LED on a SoundStructure device's front panel indicates that the SoundStructure system has not been loaded with a compatible SoundStructure Studio configuration file. To turn the front panel LED green, upload a configuration file that has been designed for the target device hardware. For example, if you have two C16's linked together, create a project that is designed for two C16s and upload that project to the SoundStructure devices.

SoundStructure Firmware 1.1.5 Release Notes

Version 1.1.5 is a maintenance release that updates the SoundStructure boot loader to version 1.3.

Enhancements

- Updated the SoundStructure boot loader to support manual selection of the boot up memory partition.

SoundStructure Firmware 1.1.4 Release Notes

Version 1.1.4 is a maintenance release that fixes an issue with the SoundStructure C8 and SR12, fixes the `phone_dial` command when used in partial presets, improves the AGC performance, and improves the internal fan control.

New Features

- Adjusted AGC so that input signal levels are more accurately measured for improved AGC performance.

- Adjusted the adaptive fan speed controller so that the fans run quieter in typical ambient environments while increasing in speed in higher ambient temperature environments.

Bug Fixes

- Fixed an issue where microphone inputs 5 and 6 on a SoundStructure C8 and selected inputs on a SoundStructure SR12 could generate choppy audio when the automixer was used on those inputs.

- Fixed an issue where the phone_dial command was not being executed when used in partial presets.

SoundStructure Firmware 1.1.3 Release Notes

Version 1.1.3 is a maintenance release that adds telephony support for the following countries:

- China
- India
- New Zealand
- Russia
- South Korea
- Taiwan

SoundStructure Studio 1.1.2 Release Notes

SoundStructure Studio version 1.1.2 is a maintenance release that adds telephony support for the following countries:

- China
- India
- New Zealand
- Russia
- South Korea
- Taiwan

SoundStructure Firmware 1.1.2 Release Notes

Version 1.1.2 is a maintenance release fixing the equalization on outputs and improving the performance of the digital microphone integration.

Enhancements

SoundStructure Firmware 1.1.2 includes an updated Clink2 driver and firmware version 26 for the HDX microphones that improves the device discovery of the HDX microphones.

HDX microphone arrays should be connected to the right rear Clink2 connection on SoundStructure (closest to the OBAM connectors). Up to 4 microphones may be daisy chained with up to 4 CLink2 microphones per SoundStructure device (a SoundStructure C8 supports 2 full HDX microphone arrays).

Installations with HDX microphones will automatically have their microphone firmware updated to version 26 once the SoundStructure Firmware has been updated to firmware 1.1.2. This microphones firmware update process only happens once.

This firmware update may be performed by the SoundStructure device as follows:

1 Unplug the Clink2 cable between the SoundStructure and the HDX video codec (if an HDX is used in the system)

2 Plug the daisy-chained set of digital microphones to the SoundStructure rear right Clink2 port (closest to the OBAM connectors) for approximately 30 seconds per microphone (4 microphones would translate to waiting 2 minutes). The microphone LED will turn amber during the firmware update process.

3 Once the microphones have been updated, check the Device Information area on the Wiring page within SoundStructure Studio to verify that all microphones have been discovered. If not all microphones have been discovered, connect microphones one at a time to the right rear Clink2 port on SoundStructure to have their firmware updated and then, once all microphones are updated, reconnect the daisy-chain.

Bug Fixes

● Fixed an issue where the graphic equalization, low shelf, high shelf, and parametric equalization did not work on line output signals.

Additional Information and Feature Limitations

This section lists additional information associated with the release and known limitations. If a work-around is available, it is listed in the text.

● Polycom HDX video codec and SoundStructure integration over Conference Link requires HDX Firmware 2.0.1 version or later. Integration with previous versions of HDX Firmware must be done by designing the system and selecting a "VSX8000" video codec instead of the HDX codec within the SoundStructure Studio software and using analog inputs and outputs between the SoundStructure device and the HDX video codec. The internal echo canceller on the video codec should be manually turned off.

● Version 2.0.1 of the HDX Firmware has a limitation that only 3 HDX microphones may be used when an HDX is connected to a SoundStructure over Conference Link. To support 4 HDX microphones, use version 2.0.2 of the HDX Firmware or use an analog connection between HDX and SoundStructure and connect the microphones to the SoundStructure device. A SoundStructure C16 or C12 support up to 4 HDX microphones, a C8 supports up to two HDX microphones.

● SoundStructure Firmware version 1.1.2 supports single SoundStructure device systems. Linking of multiple devices via OBAM is not enabled in this firmware release. As a work-around, in many cases it is possible to send audio from one SoundStructure to another using analog inputs and outputs of the SoundStructure devices and ensuring a signal that includes all the remote audio is wired to subsequent systems and sent to a submix on the additional systems to ensure that all microphones on subsequent systems have an echo canceller reference that is set to the submix that includes the remote audio.

● Logic input and output ports and the IR port can be defined but require an external control system to query the status and control the SoundStructure device based on the query results. See Chapter 3 of the SoundStructure Design manual for more information.

SoundStructure Studio 1.1.1 Release Notes

SoundStructure Studio version 1.1.1 is a maintenance release addressing several partial preset user interface issues.

Bug Fixes

- Fixed a bug where copying a partial preset with "Copy to New" created a full preset rather than a partial preset.
- Fixed a bug where using the phone_connect parameter in a partial preset caused the SoundStructure Studio software to terminate unexpectedly.

SoundStructure Firmware 1.1.1 Release Notes

Firmware version 1.1.1 is a maintenance release fixing an issue where the Line 2 telephony interface on the TEL2 card would not dial DTMF digits.

Enhancements

Phone **C**onnect parameter not saved in full presets

- Version 1.1.1 no longer stores the `phone_connect` parameter in full presets. This means that if a preset is stored while the phone is off-hook, the preset will not store the off-hook status of the phone. This prevents the situation where the phone would be forced off-hook when the preset is restored causing dial tone to be heard in the room. Existing projects with the `phone_connect` parameter in the preset will have the `phone_connect` parameter ignored upon full preset restoration.

    Partial presets can still use the `phone_connect` parameter as desired. For example, a partial preset could take the phone offhook (set `phone_connect` to 1) and dial a telephone number.

Bug Fixes

- Fixed an issue where it was not possible to dial telephone calls on Line 2 on a TEL2 interface card. The `phone_dial` command appeared to work on Line 2 but DTMF digits were not dialed. Line 1 was not affected.

Additional Information and Feature Limitations

This section lists additional information associated with the release and known limitations. If a work-around is available, it is listed in the text.

- Polycom HDX video codec and SoundStructure integration over Conference Link requires HDX Firmware 2.0.1 version or later. Integration with previous versions of HDX Firmware must be done by designing the system and selecting a "VSX8000" video codec instead of the HDX codec within the SoundStructure Studio software and using analog inputs and outputs between the SoundStructure device and the HDX video codec. The internal echo canceller on the video codec should be manually turned off.
- Version 2.0.1 of the HDX Firmware has a limitation that only 3 HDX microphones may be used when an HDX is connected to a SoundStructure over Conference Link. To support 4 HDX microphones, use an analog connection between HDX and SoundStructure and connect the microphones to the SoundStructure device. A SoundStructure C16 or C12 support up to 4 HDX microphones, a C8 supports up to two HDX microphones.

- Integration with the HDX microphones requires high-quality shielded cables that do not exceed the length limitations of a length from 18in to 100ft to the first microphone and no longer than 25ft to subsequent microphones up to a total of four microphones (dependent on the model of SoundStructure) with a total maximum length not to exceed 175ft.

- The SoundStructure SR12 cannot be linked to the Polycom HDX video conferencing system using the Conference Link interface. If it is desired to use the SR12 as a mixer of different program audio sources and loudspeaker destinations, connect the SoundStructure SR12 system to the HDX using analog inputs and outputs.

- In rare cases, a system with a SoundStructure, an HDX video codec, and HDX microphones linked together over Conference Link may not show the correct number of devices as listed in the device information area on the wiring page within SoundStructure Studio. If this happens, power cycle both the HDX and SoundStructure devices.

- SoundStructure Firmware version 1.1.1 supports single SoundStructure device systems. Linking of multiple devices via OBAM is not enabled in this firmware release. As a work-around, in many cases it is possible to send audio from one SoundStructure to another using analog inputs and outputs of the SoundStructure devices and ensuring a signal that includes all the remote audio is wired to subsequent systems and sent to a submix on the additional systems to ensure that all microphones on subsequent systems have an echo canceller reference that is set to the submix that includes the remote audio.

- Logic input and output ports and the IR port can be defined but require an external control system to query the status and control the SoundStructure device based on the query results. See Chapter 3 of the SoundStructure Design manual for more information.

SoundStructure Firmware 1.1.0 Release Notes

Firmware version 1.1.0 adds support for SoundStructure partial presets, HDX microphone arrays, the SR12 device, and fixed several bugs.

Enhancements

HDX Microphone Arrays

- Added HDX microphone array support and two API commands: mic_source_index and mic_source_type. These commands are used by SoundStructure Studio to configure the audio processing to use either the digital microphone array or analog inputs. Each digital microphone array has three microphones and requires the equivalent processing of three analog inputs. The mic_source_index and mic_source_type select whether a digital or traditional analog microphone input use the processing available for the selected input channel.

  HDX microphone arrays should be connected to the right rear Clink2 connection on SoundStructure (closest to the OBAM connectors). Up to 4 microphones may be daisy chained with up to 4 CLink2 microphones per SoundStructure device (a SoundStructure C8 supports 2 full HDX microphone arrays).

  When using with an HDX with firmware 2.0.1 and a SoundStructure device, the digital microphone arrays must have their microphone firmware updated to revision 24. The microphones firmware update process only needs to happen once. This firmware update may be performed by the SoundStructure device as follows:

- Unplug the Clink2 cable between the SoundStructure and the HDX video codec (if an HDX is used in the system)

- Plug the daisy-chained set of digital microphones to the SoundStructure rear right Clink2 port (closest to the OBAM connectors) for approximately 30 seconds per microphone (4 microphones would translate to waiting 2 minutes) as shown in the figure below.
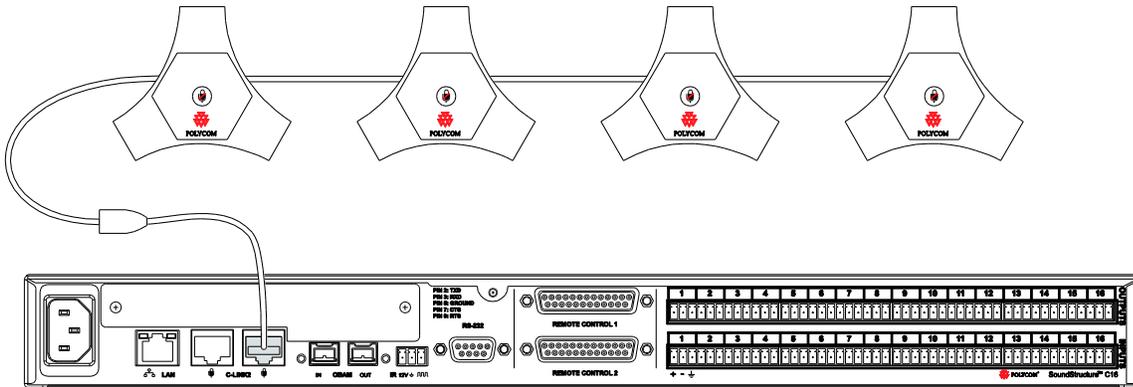
See Chapter 6 of the SoundStructure Design manual (revision B) for more information on using microphone arrays and updating the microphone firmware.

SoundStructure SR12

- The SoundStructure SR12 product is now supported with the release of version 1.1.0 firmware. The SR12 provides all the audio processing of the C-series products except for the acoustic echo cancellation processing.

API Command Examples

- API examples were added to the API reference document that may be found by browsing into the SoundStructure device or in Appendix A of the SoundStructure Design manual.

- Added commands dev_temp, dev_type, and dev_plugin_type to the API to query the temperature, the device type, and plug-in card type, respectively.

Bug Fixes

- Fixed a bug where the delay compensation feature wasn't enabled unless the input delay function was also enabled.

- Fixed that a bug where a low pass filter on the output equalization would be enabled regardless of if the output equalization was turned on or off.

- Fixed a bug where the dynamics look-ahead delay was implemented even if the dynamics processing was disabled.

- Fixed a bug that caused the SoundStructure device to not finish booting if the eth_settings was set to an empty string.

Additional Information and Feature Limitations

This section lists additional information associated with the release and known limitations. If a work-around is available, it is listed in the text.

- Polycom HDX video codec and SoundStructure integration over Conference Link requires HDX firmware 2.0.1 version or later. Integration with previous versions of HDX firmware must be done by designing the system and selecting a "VSX8000" video codec instead of the HDX codec within the SoundStructure Studio software and using analog inputs and outputs between the SoundStructure device and the HDX video codec. The internal echo canceller on the video codec should be manually turned off.

- Version 2.0.1 of the HDX firmware has a limitation that only 3 HDX microphones may be used when an HDX is connected to a SoundStructure over Conference Link. To support 4 HDX microphones, use an analog connection between HDX and SoundStructure and connect the microphones to the SoundStructure device. A SoundStructure C16 or C12 support up to 4 HDX microphones, a C8 supports up to two HDX microphones.

- Integration with the HDX microphones requires high-quality shielded cables that do not exceed the length limitations of a length from 18in to 100ft to the first microphone and no longer than 25ft to subsequent microphones up to a total of four microphones (dependent on the model of SoundStructure) with a total maximum length not to exceed 175ft.

- The SoundStructure SR12 cannot be linked to the Polycom HDX video conferencing system using the Conference Link interface. If it is desired to use the SR12 as a mixer of different program audio sources and loudspeaker destinations, connect the SoundStructure SR12 system to the HDX using analog inputs and outputs.

- In rare cases, a system with a SoundStructure, an HDX video codec, and HDX microphones linked together over Conference Link may not show the correct number of devices as listed in the device information area on the wiring page within SoundStructure Studio. If this happens, power cycle both the HDX and SoundStructure devices.

- SoundStructure Firmware version 1.1.0 supports single SoundStructure device systems. Linking of multiple devices via OBAM is not enabled in this firmware release. As a work-around, in many cases it is possible to send audio from one SoundStructure to another using analog inputs and outputs of the SoundStructure devices and ensuring a signal that includes all the remote audio is wired to subsequent systems and sent to a submix on the additional systems to ensure that all microphones on subsequent systems have an echo canceller reference that is set to the submix that includes the remote audio.

- Logic input and output ports and the IR port can be defined but require an external control system to query the status and control the SoundStructure device based on the query results. See Chapter 3 of the SoundStructure Design manual for more information.

SoundStructure Studio 1.1.0 Release Notes

Enhancements

Offline Operation and Power-on Preset

- Version 1.1.0 changed the behavior of the file open process – once a file is opened, the power-on preset is executed so that the settings of the preset become the current settings of the device. This behavior more closely matches the behavior of an online SoundStructure System that has been powered up.

Limiter on telephony output signals by default

- Version 1.1.0 added an output limiter to the telephony output signal that is activated for signals above -10dBFS and has a compression ratio of 10:1.

Filter Decay is enabled by default

- Version 1.1.0 changed the default behavior of the feedback processing by enabling the feedback filter decay mode by default. The feedback eliminator is not enabled by default however the ability to have the feedback filters relax automatically is enabled by default when the feedback eliminator is enabled.

Partial Presets

- Added support for partial presets to SoundStructure Studio. Partial presets are lists of commands that may be executed by running the run command action with the preset name as the argument. Designers may now build partial presets by selecting parameters and their arguments from drop down lists.

   An example of the command required to execute the partial preset "Volume Increment" is shown below:
   ```
   run "Volume Increment"
   ```
   See Chapter 7 of the SoundStructure Design Guide for additional information.

Offline Device Equipment Changes

- Version 1.1.0 added an option on the Wiring page to change the SoundStructure device selection or to change telephony options. This option allows growing a design from a smaller SoundStructure device to a larger SoundStructure device, shrinking larger design to a smaller device (if there are enough unused inputs or outputs), or adding, removing, or changing telephony cards. Changing the equipment may only be performed while operating Offline, i.e., not connected to the device.

SoundStructure SR12

- Support for the SR12 device has been built into SoundStructure Studio. Audio designs can be created for SoundStructure SR12's by not selecting any remote audio sources such as video conferencing or telephony options.

Polycom HDX Digital Microphone Array

- Added support for HDX ceiling microphone and table microphone arrays. HDX microphones should be connected to the right rear Conference Link port of SoundStructure. See examples in Chapter 6 of the SoundStructure Design Manual.

   HDX microphone arrays should be connected to the right rear Clink2 connection on SoundStructure (closest to the OBAM connectors). Up to 4 microphones may be daisy chained with up to 4 CLink2 microphones per SoundStructure device (a SoundStructure C8 supports 2 full HDX microphone arrays).

When using with an HDX with firmware 2.0.1 and a SoundStructure device, the digital microphone arrays must have their microphone firmware updated to revision 24. The microphones firmware update process only needs to happen once.

This firmware update may be performed by the SoundStructure device as follows:

1 Unplug the Clink2 cable from the SoundStructure to the HDX video codec (if an HDX is used in the system)

2 Plug the daisy-chained set of digital microphones to the SoundStructure rear right Clink2 port (closest to the OBAM connectors) for approximately 30 seconds per microphone (4 microphones would translate to waiting 2 minutes) as shown in the figure below.
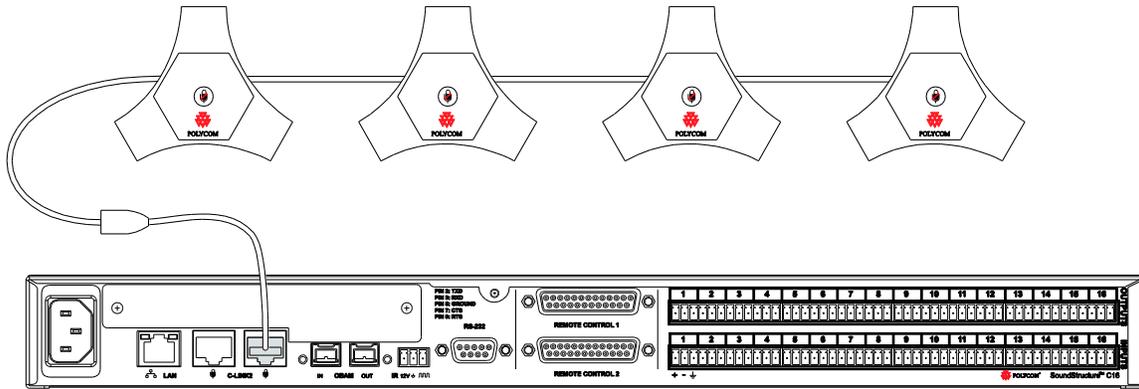
See Chapter 6 of the SoundStructure Design manual (revision B) for more information on using microphone arrays and updating the microphone firmware.

Firmware 1.1.0 or later and Hardware Revision A and Hardware ECO 1 or higher hardware revisions is required to use the HDX digital microphone arrays reliably with SoundStructure devices. To verify if you have Hardware Revision A and ECO level 1, connect to your SoundStructure device and check the wiring page as shown in the figure below. Alternatively send the API command:

```
get dev_hw_rev 1
get dev_hw_eco 1
```

and if the response is

```
val dev_hw_rev 1 "A"
val dev_hw_eco 1 1
```

or

```
val dev_hw_rev 1 "B"  (or higher)
```

the device is compatible with HDX microphones.

This ECO level can also be verified by checking for an ECO 08A-0067 on the bottom of the device and shipping packaging. Devices that are compatible with Hardware ECO 1 will have the following entry in their Device Information page.

Device Information

Device type:	c16
Bus ID:	1
Ethernet MAC:	00:04:F2:BF:01:09
Plugin card:	pstn
Hardware Revision:	A
Hardware ECO:	1
Bootloader Version:	1.2.2
Firmware Version:	1.1.0
Temperature 1 (°C):	37.5
Temperature 2 (°C):	54.4
Temperature 3 (°C):	30.6
Phantom P/S 1 (V):	48.1
Phantom P/S 2 (V):	47.1
Phantom P/S 3 (V):	47.7
Phantom P/S 4 (V):	47.7
+15V P/S (V):	14.7
-15V P/S (V):	-14.7
ConferenceLink P/S (V):	50.1
Uptime:	1:13:23:35

If your SoundStructure device does not have hardware revision A and ECO 1 or higher ECO level, or higher hardware revision (B, C, D, etc.) , information concerning upgrading your SoundStructure to the latest ECO level may be found by contacting your local Polycom Support office. In North America the support team may be reached at 1-800-Polycom.

Bug Fixes

- Fixed a bug where SoundStructure Studio would not run on a non-English Windows XP installation.
- Fixed a bug where the fader min on submix is stored in the projects current settings and preset but not restored on UI when a configuration file is opened or when a full preset is executed
- Fixed a bug where the right peak meter of a stereo virtual channel was not illuminating the top +20dB meter segment.
- Fixed a bug where the peak limiter line did not reflect the fader settings.

SoundStructure Studio 1.0.1 Release Notes

Bug Fixes

- Fixed an issue found on some PC's where the PC's network interfaces were not enumerated properly which caused SoundStructure Studio to automatically close.

- Fixed an issue where meter information from submixes was not being displayed on the Channels page.
- This version updates the matrix page user interface to only show the submix fader control on the input to the matrix rather than on both the output to the submix and on the input from the submix.

SoundStructure Studio 1.0.0 Release Notes

Initial release of the SoundStructure Studio software environment. To Install the SoundStructure Studio software, insert the SoundStructure CD-ROM and, if the autorun doesn't start automatically, run the StudioSetup-1.0.0.exe program.

Once installed, follow the instructions in Chapter 4 of the SoundStructure Design Guide to create a SoundStructure configuration file.

SoundStructure Firmware 1.0.0 Release Notes

Initial release of the firmware for the SoundStructure C16, C12, and C8.

This firmware supports full audio processing on the SoundStructure products including:

- Mono or stereo acoustic echo cancellation on all inputs
- Noise cancellation on all inputs
- Feedback elimination on all inputs
- Gain sharing and gated styles of automixers on all inputs
- Equalization and dynamics processing on all inputs, outputs, and submixes
- Support for 16 submixes on a C16, 12 on a C12, and 8 on a C8
- Support for multiple presets
- Support for static and dynamic IP addresses
- Full configuration and control over Ethernet or RS-232 interfaces
- Direct digital integration with the Polycom HDX video conferencing system over the Conference Link2 interface.

Additional Information and Feature Limitations

This section lists additional information associated with the release and known limitations. If a work-around is available, it is listed in the text.

- Polycom HDX video codec and SoundStructure integration over Conference Link requires HDX Firmware 2.0.1 version or later. Integration with previous versions of HDX Firmware must be done by designing the system and selecting a "VSX8000" video codec instead of the HDX codec within the SoundStructure Studio software and using analog inputs and outputs between the SoundStructure device and the HDX video codec. The internal echo canceller on the video codec should be manually turned off.

- SoundStructure Firmware version 1.0.0 supports single SoundStructure device systems. Linking of multiple devices via OBAM is not enabled in this firmware release. As a work-around, in many cases it is possible to send audio from one SoundStructure to another using analog inputs and outputs of the SoundStructure devices and ensuring a signal that includes all the remote audio is wired to subsequent systems and sent to a submix on the additional systems to ensure that all microphones on subsequent systems have an echo canceller reference that is set to the submix that includes the remote audio.

- The Polycom HDX digital microphones are not supported in this firmware release.

- Logic input and output ports and the IR port can be defined but require an external control system to query the status and control the SoundStructure device based on the query results. See Chapter 3 of the SoundStructure Design manual for more information.

Copyright and Trademark Information