



Release Notes

Polycom
SoundStructure Device Firmware
and SoundStructure Studio Software

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1. 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
```

2. 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.

3. SoundStructure Studio 1.2.1 Release Notes

May 18, 2009

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 microphone 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 from 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.

4. SoundStructure firmware 1.2.3 Release Notes

March 17, 2009

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.

5. SoundStructure firmware 1.2.2 Release Notes

February 27, 2009

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.

6. SoundStructure firmware 1.2.1 Release Notes

December 19, 2008

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.

7. SoundStructure Studio 1.2.0 Release Notes

November 14, 2008

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 crosspoints, or wait for all values to change before further adjusting the same set of crosspoints.

8. SoundStructure firmware 1.2.0 Release Notes

November 14, 2008

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.

9. SoundStructure firmware 1.1.5 Release Notes

May 6, 2008

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.

10. SoundStructure firmware 1.1.4 Release Notes

May 1, 2008

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.

Enhancements

- 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.

11. SoundStructure firmware 1.1.3 Release Notes

April 17, 2008

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

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

12. SoundStructure Studio 1.1.2 Release Notes

April 17, 2008

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

13. SoundStructure firmware 1.1.2 Release Notes

April 4, 2008

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 microphone 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.

13.1 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.

14. SoundStructure Studio 1.1.1 Release Notes

April 4, 2008

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.

15. SoundStructure firmware 1.1.1 Release Notes

February 28, 2008

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

15.1.1 phone_connect 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 can not 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.

16. SoundStructure firmware 1.1.0 Release Notes

February 11, 2008

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

Enhancements

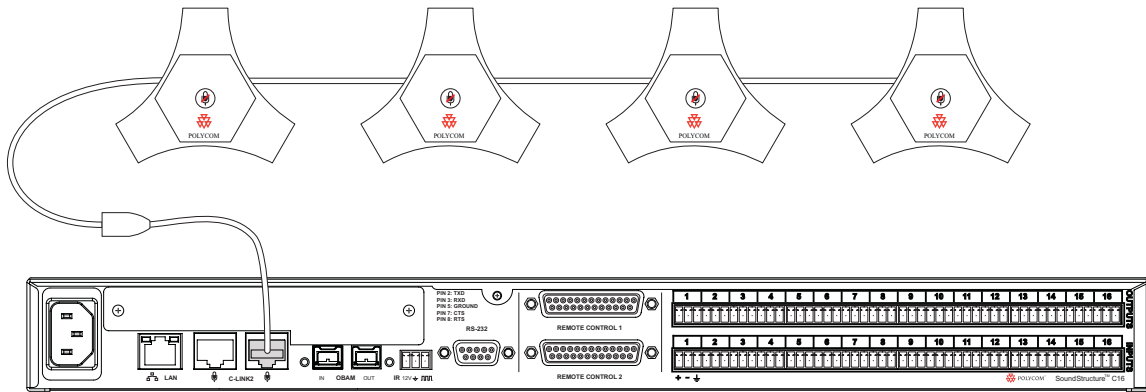
16.1.1 HDX Microphone Arrays

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:

4. Unplug the Clink2 cable between the SoundStructure and the HDX video codec (if an HDX is used in the system)
5. 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.

16.1.2 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.

16.1.3 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 can not 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.

17. SoundStructure Studio 1.1.0 Release Notes

February 22, 2008

Enhancements

17.1.1 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.

17.1.2 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 ration of 10:1.

17.1.3 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.

17.1.4 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.

17.1.5 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.

17.1.6 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.

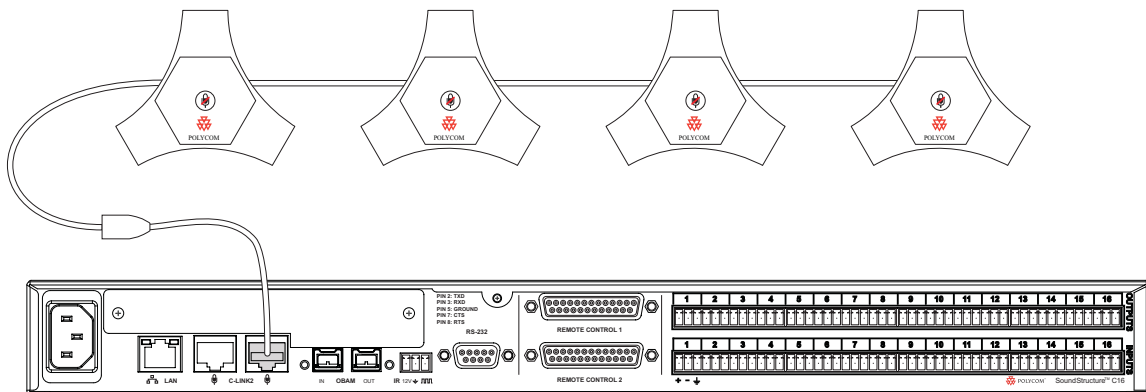
17.1.7 Polycom HDX Digital Microphone Array

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:	nsth
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, information concerning upgrading your SoundStructure to the latest ECO level may be found by sending an email to SoundStructureUpdate@polycom.com – the response will include the instructions, by calling 770 350 4152, or 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.

18. SoundStructure Studio 1.0.1 Release Notes

December 6, 2007

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.

19. SoundStructure Studio 1.0.0 Release Notes

November 7, 2007

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.

20. SoundStructure firmware 1.0.0 Release Notes

November 7, 2007

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.