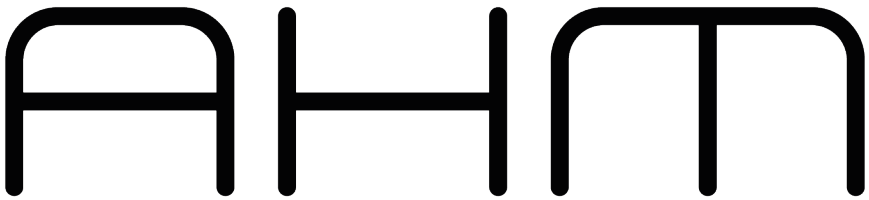

System Manager Help

V1.5

ALLEN&HEATH®

Important

System operating firmware

The function of AHM is determined by the firmware (operating software) that runs it. Firmware is updated regularly as new features are added and improvements made.

ⓘ Check www.allen-heath.com for the latest version of AHM firmware.

Software licence agreement

By using AHM you agree to be bound by the terms of the relevant End User Licence Agreement (EULA), a copy of which can be found at www.allen-heath.com/legal/. You agree to be bound by the terms of the EULA by installing, copying, or using the software.

Further information

Please refer to the Allen & Heath website for further information, knowledgebase and technical support. For more information on AHM hardware, system setup and connections please refer to the AHM Getting Started Guides available for download at: www.allen-heath.com

You can also join our Allen & Heath Digital Community to share knowledge and information with other AHM users: community.allen-heath.com

AHM System Manager Help

ALLEN&HEATH

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Contents

1. Screen Layout

1.1. Tabs

The top two rows of tabs are used to navigate the AHM System Manager software.

1.2. Main Window

The main window displays the currently selected screen.

1.3. Status Bar

The Status Bar is always visible and shows useful information for the operator.

The current connection status is shown. When System Manager is not connected to an AHM unit, Not Connected is displayed. When System Manager is connected to a hardware unit, Connected to <Unit Name> is displayed. When System Manager is running in offline mode, Connected to Offline is displayed.

Last Preset displays the name of the last recalled Preset on the system.

Monitor Point displays the currently monitored signal and follows the mouse pointer and active window.

Click on New Window to open a second window, displaying the Channels screens, that can be used independently of the main window.

2. System

2.1. Connect

Recent Units shows the most recently connected AHM processors. To clear this list, select Clear Recent Unit List.

Click on a unit to connect. The default login details are Username: Admin and Password: [blank] (unless a password is specified).

Other AHM processors visible on the network are displayed under Other Detected Units. Click on a unit to connect.

To manually enter the IP address of the AHM unit you wish to connect to, click in the text box below Connect by IP address, type in the IP address of the unit and click Connect.

To run AHM System Manager offline with no AHM processor connected, select Run Offline AHM-64, AHM-32 or AHM-16.

To run another instance of AHM System Manager, for example to connect to a second unit, select Run New Instance. Only one instance per AHM model can run in Offline mode at a time.

2.2. Unit Firmware Updater

To update the firmware of a connected AHM unit, click on Unit Firmware Updater to open the firmware update window.

The version of firmware packaged with System Manager is shown.

Select the AHM unit that you wish to update by clicking on Detected Unit and selecting the unit from the Unit To Update dropdown.

If the unit is not visible or you are updating the unit from another network, for instance over WAN, you can select Connect by IP Address and enter the IP address of the target AHM unit.

The Admin Password for the unit, if one is specified, should be entered to enable the update.

The AHM unit will be updated to the same version number as the instance of System Manager that you are running. For example, if you are running System Manager V1.01, a firmware update will change the AHM firmware to V1.01. If you need to update or roll-back the AHM unit with a different version of firmware, download the appropriate version of AHM System Manager.

Click Update to perform the firmware update.

Updating firmware resets parameters and preferences. To restore your current settings, leave the Restore current Config after updating option checked (from V1.43 or newer) or ensure a Config is saved on your computer before updating. Recall the Config after the firmware update unless the automatic restore option was used.

2.3. Status

The name of the currently connected AHM unit is displayed on this screen.

Note: The System Status tab is only visible when a unit is connected, or System Manager is running in Offline mode.

Click Disconnect to disconnect System Manager from the AHM unit.

Power Status displays the status of the internal PSU and, if present, the external +12V DC supply (AHM-64 only).

Unit Firmware Version displays the current version of firmware on the AHM unit.

System Manager Version displays the current version of System Manager software.

The unit IP address and MAC address are also shown.

2.4. User Libraries

Channel and processing User Libraries are stored locally on the machine running System Manager. Select a Library to Rename or Delete it.

Click Export Libraries to archive any number of User Libraries into a single file, for example to create a backup on a USB device, or transferring to another computer.

Click Import Libraries and select a library archive to import User Libraries. Confirm which Libraries you wish to import.

2.5. Logs

View log files from the connected AHM hardware unit and the AHM System Manager software. The logs can be viewed independently, or together in a Combined Log, using the radio buttons.

A red entry in the logs indicates an error message or warning. To save the logs to your computer or storage device, use the Export Logs option. Exported logs can be useful for diagnostics when contacting us for support.

Select Clear Logs to erase the contents of the logs.

3. Configure

3.1. Unit

3.1.1. Input Stereos

Use this window to set stereo Input channels. Adjacent odd/even pairs can be linked (e.g. 1+2, 3+4 etc.). When a pair of channels are active as a stereo Input, they are highlighted in blue.

A stereo channel has the same processing options as a mono channel and is displayed as a single channel strip in the Channels/Inputs window.

Input channel mono/stereo status is stored at the Config level and cannot be changed by a Preset.

3.1.2. Zones Configuration

AHM-64, AHM-32 and AHM-16 feature 64, 32 or 16 output processing channels respectively, which can be utilised for Zones and speaker processing.

Configure the Number of Zones by clicking on the dropdown. The number of unused processing outputs is displayed.

The Zones Configuration is stored at the Config level and cannot be changed by a Preset.

Zone Stereo Pairs

Set stereo Zones. Adjacent odd/even pairs can be linked (e.g. 1+2, 3+4 etc.) When a pair of Zones are configured as a stereo Zone, they are highlighted in blue.

A stereo Zone has the same processing options as a mono Zone and is displayed as a single channel strip in the Channels/Zones window.

Speaker Processing

Configure the number of crossovers per Zone, with options for 1-way, 2-way, 3-way, 4-way or no crossovers per Zone:

- 1-way Crossover = 1-Way Out
- 2-way Crossover = Low / High
- 3-way Crossover = Low / Mid / High
- 4-way Crossover = Low / Low-Mid / High-Mid / High

A Zone with one or more active crossovers is highlighted in yellow.

A Zone always includes a full range output in addition to any crossover outputs that have been configured.

Each crossover way on a mono Zone utilises one additional output processing channel, and each crossover way on a stereo Zone utilises two additional output processing channels.

i.e.

- Mono Zone with 0 Crossover = 1 Output Processing Channel
- Mono Zone with 1-way Crossover = 2 Output Processing Channels
- Mono Zone with 2-way Crossover = 3 Output Processing Channels
- Mono Zone with 3-way Crossover = 4 Output Processing Channels
- Mono Zone with 4-way Crossover = 5 Output Processing Channels

- Stereo Zone with 0 Crossover = 2 Output Processing Channels
- Stereo Zone with 1-way Crossover = 4 Output Processing Channels
- Stereo Zone with 2-way Crossover = 6 Output Processing Channels
- Stereo Zone with 3-way Crossover = 8 Output Processing Channels
- Stereo Zone with 4-way Crossover = 10 Output Processing Channels

3.1.3. Signal Generators

The Signal Generator provides a test signal to help you align and test components of a sound system. This gives easy checking of features such as signal paths or audio processing through the system, and general audio diagnostics.

A total of 8 Signal Generators are available, all of which can be configured independently and routed to Input channels. Use the Signal Generator dropdown to select the Signal Generator to configure.

Four Signal Types are available;

- Sine
- White noise
- Pink noise
- Band Pass noise

The level of the signal can be set between -72dB to +18dB with the Gain control, and the Mute button will turn the signal fully off.

The Frequency control can be used with Sine and Band Pass signals to set the desired frequency.

A Signal Generator can be patched to an Input via the Channels/Inputs/Input block screen or the Assign/IO Patchbay/Input Channels screen.

Signal Generator configuration is stored at Config level and cannot be changed by a Preset.

3.1.4. Audio Sync

Select the digital audio clock source for the AHM unit:

- Unit Internal – use the AHM's internal 96kHz clock and operate as clock leader.
- I/O Port –the AHM unit follows another device connected via an I/O Port module (e.g. Dante). Ensure the other device is configured as the clock leader.
- SLink –the AHM unit follows another device connected via the built-in SLink port (AHM-64 only). Ensure the other device is configured as the clock leader.

3.1.5. Chromatic Meter

Configure the behaviour of the high-resolution Chromatic Meter LED - labelled SIG - on the front panel of the AHM-64, or on the front panel screen of the AHM-16 / AHM-32.

Seven Audio Signal States are provided, with five of them offering user-definable Audio Level, Colour and Intensity settings. Two of the states, Peak and Inactive, have fixed values which cannot be adjusted.

Click and drag, or double click and type, the desired value for each Audio Level. Values are bound by the level settings of the states above and below the current state.

The Colour of each Audio Level can be chosen from a palette of 10 colours. The Peak and Inactive states have fixed colours of Red and Off respectively.

The meter Intensity of each state can be chosen from the following options;

- Fixed – meter switches instantly between states
- Variable 1 – meter changes close to the endpoints of its range
- Variable 2 – meter changes across the entire range

Click Reset to defaults to return the Chromatic Meter settings to their default state.

The Status Panel Meter mirrors the front panel meter.

3.1.6. Metering Ballistics

The response of meters on screen can be adjusted to suit the application.

Use fast Attack and Release for fast response, digital absolute peak meters. This ensures you keep control and avoid digital clipping of signals including those with very fast dynamics. Use slower Attack and Release to "dampen" the response if required.

The Peak Hold Time can be set between 20ms to 10s, or to infinite. This is the amount of time the highest segment of the meter will stay lit and indicates the highest signal level within such time. It also affects the red peak indicator. The red peak indicator lights to warn that the signal is within 5dB of clipping. The peak indicator is multi-point sensing so it detects peak activity at several points in the signal path.

Select Clear Peak Hold to clear all current Peak Hold indicators.

An onscreen meter is displayed to enable visualisation of the changes that you make. Use the Displayed Meter Source dropdown to select the Input or Zone that is used for this meter.

Selecting Reset to defaults will revert all settings to their default values.

3.1.7. Network

A name with up to 16 characters can be set to identify the AHM unit on the network.

To change this, click in the Unit Name text box and enter a name.

Select DHCP Enabled to allocate an IP Address to the AHM unit by a network DHCP server, such as a Wi-Fi router. With DHCP Enabled and no DHCP server present, the AHM unit will default to a link-local address in the 168.254.X.X/16 range. If you notice extended period of connection time, consider setting up a DHCP server with a smaller address pool or assigning your AHM to a static address.

To set a static IP Address, click the IP Address box and type in the desired address. Make sure the Subnet Mask and Gateway are valid, and all devices on the network including controllers, access points or laptops have unique but compatible addresses.

The default settings are:

Name:
AHM-64 / AHM-32 / AHM-16

IP Address:
192.168.1.90 (AHM-64) or 192.168.1.91 (AHM-32 / AHM-16)

Subnet Mask:
255.255.255.0

Gateway:
192.168.1.254

To reset the network settings to factory default, please refer to the AHM-64 / AHM-32 / AHM-16 Getting Started Guide.

A restart of the AHM unit is required for changes to the network settings to take effect. Select Restart Unit to automatically restart the AHM unit and apply changes.

3.1.8. Unit Time

System Manager Time displays the date and time on the computer running System Manager.

Unit Time displays the date and time on the AHM's internal clock.

The AHM Unit Time has two modes. Manual Mode uses AHM's internal clock. NTP Mode synchronises the internal clock to an external NTP server.

Manual Controls:

Unit Time -1Hr and Unit Time +1Hr can be used to change the AHM's internal clock in 1-hour increments. This can be useful for quickly changing the clock to account for Daylight Savings Time.

Sync Unit Time changes the AHM internal clock to reflect the local clock on your computer.

Click Edit Unit Time to edit the AHM's internal date and time.

NTP:

Click Edit NTP & Time Zone to add the IP address of up to 3 NTP servers and specify the Time Zone. Example internet based NTP servers are provided by default and free to use:

- 0.pool.ntp.org
- 1.pool.ntp.org
- 2.pool.ntp.org

Click Test NTP Sync to check that the NTP settings are working.

3.1.9. Email Notification

Email notifications containing logs can be sent via an SMTP server via Triggers or the Event Scheduler.

Enter the SMTP Server IP address and Port. Choose the Connection and Authentication type, and enter the Login name, Password, and Sender and Recipient email addresses and names.

Click on the Triggers dropdown to choose which event types will generate an email notification, for example Errors Only. Select None when using the Event Scheduler to trigger email notifications.

Click Send Test Email to check the settings are valid and the email system working.

3.1.10. Save Config

Config files store the Unit Configuration, Preset memories, and current settings. They can also store any Audio Files, User Profile settings and Custom Control Config loaded in the AHM unit.

Current settings are stored as a hidden Preset memory and recalled when the Config file is loaded.

Note that Network settings and User Profile passwords are NOT stored in a Config. If replacing or duplicating a unit, these must be configured manually to match the original unit.

Click on Save Config, select a folder and enter a file name. Click Save. A pop-up message will appear. Choose whether User Profiles, Audio Files or the Custom Control Config should be stored as part of this Config file.

3.1.11. Restore Config

Load a previously saved Config file.

This will overwrite all current settings, Unit Configuration and Preset memories!

It is recommended you back-up your current settings first by saving a Config file.

Note - when restoring a Config that was created on a different unit type (e.g. AHM-64 to AHM-16), System Manager will attempt a best-fit of the Config but some settings will be reset, such as AMM assignments.

Select a file and click Open. A pop-up message will appear. Choose whether User Profiles, Audio Files or the Custom Control Config should be loaded as part of this Config file. This will overwrite any existing User Profile, audio files, or Custom Control Config based on your selection.

3.1.12. Template Config

Load a factory Template Config file. Useful for starting a new project from a blank state.

3.1.13. Unmute Delay

This is an optional setting that adds a 60-second delay before the local audio is unmuted when the AHM is powered on.

In situations where the speaker system is powered on before the AHM, enabling the Unmute Delay will prevent any unwanted noise during power-up.

3.2. Controllers

Connect, configure and simulate control options including GPIO, front panel controls and the Allen & Heath IP1, IP6 and IP8 controllers.

Select a controller type on the right-hand side of the screen:

- Unit GPIO – the rear panel 2x2 GPIO connections
- Unit Level Sensing – 10 configurable virtual switches, automatically triggered by audio level sensing
- Front Panel – the front panel controls on AHM-16 and AHM-32
- IP1 – Wallplate 1-rotary remote controller
- IP4 – Wallplate 4-button remote controller
- IP6 – 6 rotary remote controller
- IP8 – 8 fader remote controller
- GPIO –External Allen & Heath 8x8 GPIO interface

Use the Setup area of the screen to configure the operation of the selected remote controller, GPIO or front panel.

Click Open Simulation to test the operation of the currently selected remote controller or panel (not available for Level Sensing).

3.2.1. IP Controllers and GPIO

Select the controller slot you wish to configure. Each slot represents a discrete controller which can be pre-configured and later assigned to a hardware unit.

Click on Device Assignment to assign a hardware unit to the slot. A list of compatible, connected devices will be shown. Alternatively, the IP address of the controller can be added manually in the Connect by IP address box. Click on Identify on an assigned controller to flash the LCD screen and softkeys for 60 seconds.

When working offline in System Manager, enable Connections Inhibited (Offline Mode) to prevent System Manager taking control of IP Controllers on the network which may be connected to an AHM unit. Disable this setting to connect IP controllers to your offline AHM instance.

Select a SoftKey, GPI or GPO on the Setup screen to assign a Function. Functions include mutes, level up/down, audio playback (press to play, press once to pause, press and hold to stop), external control, paging and preset recall (up to 20 presets). Switches and GPI can have different functions attributed to the Press and Release states if required.

Select a fader/rotary control to assign a Function. Functions include Input level, Zone level, Control Group level, crosspoint (XPoint) level and Room level.

IP6 and IP1 rotaries have a Shift function accessed by pressing the rotary control. If Shift to Mute is enabled, the Shift function is overridden.

Once a function is selected, set the channel and any other associated option or field, for example, Max/Min Level.

Leave the Release tab Unused unless a separate function is required at release of the SoftKey/GPI.

The LED tab sets the behaviour of the SoftKey illumination. The LED Function automatically matches the Function assigned to the SoftKey Press, unless a custom function is set instead.

SoftKeys, Rotaries and Faders where the Function is Unused have a Display Text option to display static text on the LCD screen of IP1, IP6 and IP8 controllers.

Enable Auto Dim to dim the IP controller displays automatically 10s after each use.

Use Disable Brightness Button to disable the brightness button on IP6 and IP8 controllers.

Click Copy To… or Copy From… to copy settings to/from another controller slot. This is useful when multiple controllers with similar settings are required throughout a building.

3.2.2. Layers

IP6 and IP8 controllers can operate with up to 6 layers to provide more control.

Select the Layer and assign functions as above. Make sure some SoftKeys are assigned to the Layer Change function in every layer so they can be used to navigate between other layers. Typically, the 6 SoftKeys to the right of the IP8 and the bottom of the IP6 are used for layer navigation.

3.2.3. Paging

Paging can be assigned to SoftKey or GPI control. Paging works in both momentary (press and hold down to talk) and latching mode (press once to activate, press again to deactivate).

Select the paging Input from the Input dropdown. Select one or more target Zones from the Zones dropdown.

Paging Inputs should be routed to Zones as normal via XPoint Routing. When Paging is active, the XPoint from the paging Input to the target Zone(s) is unmuted. When paging is inactive, the XPoint from the paging Input to the target Zone(s) is muted.

Paging can be used in conjunction with Priority Inputs to enable ducking of other Inputs to the Zone(s). See the Priority Inputs section for more information.

3.2.4. Level Sensing

10 virtual switches are provided. Each switch can be configured to automatically turn on when a specified signal level is exceeded and turn off when the signal drops below a specified value. Click on a switch to access the settings.

Position selects the pick off point for the level sensing on an Input or a Zone.

Select the Input or Zone to be monitored.

Switch On sets the level at which the virtual switch will be activated, and the function attributed to Press will be triggered.

Switch Off determines the level at which the virtual switch will be deactivated, and the function attributed to Release will be triggered.

Hold Time determines how long the Press function will remain active after the signal drops below the Switch Off threshold.

3.2.5. Front Panel

You can adjust the Screen Brightness, LED Brightness and Key Brightness of the AHM-16 or AHM-32 front panel via the settings on the Setup window. Click and drag a setting to adjust. The Auto Dim checkbox enables a second set of dimmed values for each parameter. After 10 seconds, the Auto Dim settings take effect.

Select a SoftKey to assign a Function under the Press, Release and LED tabs. Functions include mutes, level, external control, paging, source selection and preset recall. A different function can be attributed to the Press and Release states if required.

The LED tab sets the illumination behaviour of the selected SoftKey. The LED Function automatically matches the Function assigned to the SoftKey Press, unless a custom function is set instead.

When a front panel SoftKey assigned to a Level is pressed, the front panel screen will display the Input or Zone name, level and meter. Use the arrow keys on the front panel to control the level.

When a front panel SoftKey assigned to a Source Select is pressed, the front panel screen will display the active source and the Zone name, level and meter. Use the arrow keys on the front panel to control the level of the Zone. Press the Sel key to display the list of available sources. Use the arrow keys to select the source and press Sel again to confirm. Press the SoftKey again to exit Source Select mode.

When a front panel SoftKey assigned to Preset Select is pressed, the front panel screen will display the list of available presets as configured. Use the arrow keys on the front panel to select the Preset and press the Sel key to recall. The screen will then display the active Preset. Press Sel again to select another Preset. Press the SoftKey again to exit Preset Select mode.

3.3. SLink

The built-in SLink port (AHM-64 only) is compatible with dSnake, DX and gigaACE/GX protocols. The currently active mode, and connected device(s), are shown on this screen.

3.4. I/O Port

Shows the options, if available, for the installed I/O card.

Enable the Internal Network Bridge on a Dante or Waves card to link the AHM control network with the Dante or Waves network, for example for situations where the same computer is used to run AHM System Manager and Dante Controller.

3.5. Profiles

User Profiles other than the Admin profile can be configured to restrict operator access for System Manager and Custom Control applications.

The Admin user has access to AHM System Manager and all functions, and can set permissions and allocate passwords if required for the other users. Click a User to edit the profile.

Other users have permission-based access to AHM System Manager as set by the Admin. They can also be used to access Custom Control Layouts assigned to them.

Click Change User Name to enter a name up to 16 characters long. Click Change Password to set or change a password up to 16 characters long. Click Edit Comment to enter an additional note.

Click Activate User to enable the User.

Click Set Permissions to allow or restrict access to areas of AHM System Manager. User permissions in System Manager do not affect controls within a Custom Control layout.

3.6. External Control

A TCP Protocol for control and interrogation of AHM parameters is available and documented at www.allen-heath.com. Clients should be configured to use TCP port 51325 (unsecured) or the TLS/TCP port 51327.

Select the appropriate Unit Security Level from:

- No Security – the connection has no security applied.
- SSL – the connection utilises SSL security. An SSL certificate and key are required for SSL authentication.
- Disable External Control – the connection is disabled completely.

Click Select Certificate File to choose the SSL certificate on your computer or local storage. The expected file extension is *.pem

Click Select Key File to choose the private key on your computer or local storage. The expected file extension is *.key

Once the SSL certificate and key files have been chosen, click Upload to Unit to transfer the files to the AHM unit.

After changing settings, the AHM unit must be restarted to apply the changes. Click Restart Unit to restart the AHM unit.

4. Manage

4.1. Presets

4.1.1. Preset List

A list of the 500 Presets in the current Config is displayed on the left-hand side.

Icons are displayed in the list alongside a Preset name if an Embedded Recall, External/IP Control action, or Track Playback are set for the Preset.

A green tick indicates that a Preset has valid content stored. An exlamation mark (!) indicates that no Recall Scope is set for this Preset (the Preset will not recall any setting). A blue triangle indicates the Last recalled Preset.

Select the Name box to type in a name up to 16 characters long for the currently selected Preset. Select the Description box to enter a note about the Preset.

4.1.2. Store / Delete / Recall / Undo Recall

Select Recall to recall the highlighted Preset. Select Undo Recall to restore the settings prior to the Preset recall.

Select Store Preset to store all current settings to the selected Preset.

Select Delete Preset to clear the name, content and Recall Scope of the Preset.

To force a Preset recall when the AHM unit starts up, select a Preset in the Unit startup preset dropdown.

4.1.3. Recall Scope

When a Preset is stored, it saves all current parameters and settings. By default, no parameter or setting is recalled when the Preset is recalled. Parameters to be recalled must be specified Preset by Preset.

For instance, a Preset could be configured to only recall an individual Zone output level while ignoring all other parameters stored.

Click Recall Scope to open the recall scope for the currently selected Preset.

The top section of the recall scope contains the parameter groups (e.g. Input Processing, I/O Patchbay etc)

Click on a square next to a parameter group name to recall all parameters within that group. A white square indicates that the entire parameter group will be recalled. A grey square indicates that the parameter group contents will not be recalled. A hybrid state is shown when only some parameters in the group will be recalled.

Click on a parameter group's name to view its contents in the main area. Individual parameters can be allowed by clicking on the appropriate square on the grid. A white square indicates the parameter will be recalled; a grey square indicates the parameter will not be recalled. Click on the + next to a parameter name to expand the contents or click on the – to minimise the contents.

Click on OK to save changes or Cancel to discard.

Click on Copy From… or Copy To… to copy the Recall Scope to/from other Presets. This is useful when multiple presets are needed for the same subset of settings, for example, 'scenes' for a specific Zone.

4.1.4. External/IP Control

Custom strings can be sent over TCP/IP when recalling a Preset. Each Preset can have a unique custom string associated with it.

Select External Control to broadcast a custom string from the AHM onto the local control network (at TCP port 51325 or TLS/TCP port 51327 if security is enabled), for example for use with the MIDI Control Driver.

Select IP Control to send the custom string to a specific device on the network. Enter the IP Address, Port and Mode (TCP or UDP) of the target device.

Custom strings can be entered in comma or space separated two-character hexadecimal, decimal or ASCII strings.

For example:

Valid hex string:

AB,12,CD,34

AB 12 CD 34

Not Valid:

AB12CD34

Once defined, the custom string is sent on recall of the Preset.

4.1.5. Track Playback

A track can be chosen to automatically play on a Preset recall. Click Track Playback to select a track for the currently selected Preset and select whether the track plays in stereo or on mono player 1 or 2. Split Mono must be activated on the Playback page for the mono player options.

4.1.6. Embedded Recall

Automate the recall of one or more other Presets, from the same or a different AHM unit, when you recall a Preset.

Select the target unit from the Unit Name drop-down. All compatible Allen & Heath units found on the network are listed here. Select 'This AHM' to automate Presets on the local system. Select 'Custom' to enter a target IP address manually.

Select the Preset you wish to embed. Its name is displayed below the box.

Set the Delay time for the embedded Preset recall. This is the time the system waits before recalling the Preset after you have recalled the host Preset. Time can be set from 0 sec (instant) to 4 minutes.

Click Add to add the Preset to the list on the right. The list shows the embedded Presets together with associated units and delay times.

Select a Preset from the list and click Remove to remove it from the embedded recall.

Select Track Embedded Recalls to have the Last Preset indicator follow embedded recalls.

4.2. Preset Crossfades

Set crossfade times, up to 20 seconds, for the currently selected Preset.

This time sets how long it takes for levels to change from their current settings to the settings of the Preset being recalled.

Crossfades can be configured for;

- Input levels
- Zone levels
- Group levels
- Input/Zone XPoint levels
- Zone/Zone XPoint levels
- AEC Sound Reinforcement / Zone XPoint levels

Click on Input, Zone or Group to set crossfade times for these levels. Crossfades can be set individually, in multiples or globally. Select the level(s) you wish to apply a crossfade to, set the desired Crossfade Time and click Apply to selected. The current crossfade time(s) will be displayed next to the name of the Input, Zone or Control Group.

Different crossfade times can be specified for individual Inputs, Zones and Control Groups. For instance, Input 1 could have a crossfade time of 5 seconds and Input 2 could have a crossfade time of 10 seconds.

Click on Input/Zone XPoint or Zone/Zone XPoint to set crossfade times for these levels. Crossfades can be set individually, in multiples or globally. Select the XPoint(s) you wish to apply a crossfade to, set the desired Crossfade Time and click Apply to selected. The current crossfade time(s) will be displayed in the crosspoint (XPoint) grid and highlighted white if enabled. Click on a crosspoint (XPoint) to disable the crossfade – a disabled crossfade is indicated by a black crosspoint (XPoint) in the grid.

Different Crossfade values can be specified for each Preset. The crossfade settings are stored within the Preset at the time of a Preset Store. Remember to store the Preset after making changes to crossfade times.

4.3. Playback

The playback of audio files, stored on the AHM unit, can be triggered by Events, Preset recalls, SoftKeys, GPI or external TCP control.

Supported file types are mono/stereo .WAV (16/24bit, 44.1/48/96kHz) and MP3. The AHM-64 also supports FLAC type files. There is ~2.6GB of internal storage available on the AHM processor for audio files.

A list of Available Tracks on the local storage is listed with the Track ID and Track Name. The amount of playback storage remaining is shown at the bottom of this list.

Click Upload Tracks to upload compatible audio files from your computer to the AHM unit over the network connection.

Select a track in the list and click Delete Track to permanently remove it from the local storage.

Clicking Delete All Tracks will permanently remove all audio files from the AHM unit.

Click Start Selected Track to play the currently selected track.

It is possible to playback one side of a stereo file if required (AHM-64 only). Select Split Mono and choose either Mono 1 (Left) or Mono 2 (Right).

Playback audio can be patched to any Input channel using the Assign screen.

4.4. Events

Scheduled Events can be configured to recall a Preset, playback an audio track or send logs via email at specific times. Scheduled events are not saved in presets but are saved at the Config level.

A list of the 50 available events is shown on the screen.

Click on an Event to highlight it and click Edit Selected Event to open the event editing window.

4.4.1. Activity

Select Disabled to disable the event and prevent it from triggering.

Enable Once if the event should only occur once when the criteria are met.

Enable Repeat if the event should occur every time the criteria are met.

Choose the Event Type:

- Preset Recall recalls the specified Preset.
- Track Playback plays a specified audio file.
- Email Logs sends the logs over email. Check the Email Notification settings for server and mailbox.

4.4.2. Time

Use the dropdowns to specify a Time in HH:MM:SS format. The time is represented in 24-hour format.

An event can be triggered Every Day, or on Specific Days by selecting the relevant option.

When Specific Days is selected, a list of days is displayed to allow the selection of days when the event will be triggered at the specified time.

Click on OK to save your changes or click Cancel to discard.

5. Channels

5.1. Inputs

This screen shows the Input processing channels and their processing blocks, with a horizontal signal flow view and clear indication of which processing block is currently active. Click on a processing block to edit.

5.1.1. Hot Keys

A number of Hot Keys are available for fast navigation of the Channel view in System Manager

- Ctrl + Click - Toggle In/Out status on channel processing blocks
- Arrow Keys - Left/Right keys change the processing block being viewed and Up/Down keys select the previous/next channel
- Right Click Name block - Change the colour of a channel via right click on the Channel name/colour block
- Right Click PEQ block - Opens a PEQ Quick View window. Use Ctrl/Cmd + Right Click on other channel's PEQs on the same page to temporarily gang the EQs together. See the EQ Ganging section for more information.
- Right Click Level block- Set the level to 0dB or -inf and toggle mute via right click on the Channel Level block.
- Right Click on any fader to set a level.

5.1.2. Name

Name the channel and select a colour for easy identification.

Click Library to store the current Input channel processing settings as a Library preset, or to recall an existing one. Input Libraries store Gate, PEQ, Compressor and Delay settings, but not the channel name or colour, preamp settings, Insert, AMM assignment, level/mute or routing.

Paste Multiple is available on channel names for Inputs, Zones, Groups and Source Selectors. As well as copy/paste when right clicking in a name entry box, there is a Paste Multiple option. Multi-line text can be copy/paste to a channel and each line of text is used to name this and subsequent channels. For example, if you have a document or spreadsheet with all the required channel names, you can simply copy all those names at once and use paste-multiple on the first channel (Note that leading and trailing whitespace is automatically removed from each line of pasted text, as are blank lines). Two names are required for each stereo channel, however, only the left channel name is used while the right name is ignored.

5.1.3. Input

Use the Source dropdown to select the analogue or digital source you wish to patch to the channel.

If the patched source is analogue, preamp controls are shown. Click and drag on the Gain box to change the preamp gain setting or double click and type in a gain value to achieve an optimal input level. Pad switches in a -20dB input attenuator, and the combined Gain+Pad value is shown in the Gain box. Click the 48V box to enable phantom power.

Trim provides +/- 24dB control in addition to the preamp gain, or when the source does not have a preamp (e.g. digital inputs). Polarity toggles between normal and reverse polarity.

If the channel is configured as stereo, then the Stereo Mode dropdown is shown. Available modes are as follows:

- L/R - Normal stereo Input
- R/L - Reversed stereo Input (R/L)
- L –Pol/R - Stereo with inverted Left polarity
- R –Pol/L - Reversed stereo with inverted Right polarity
- Mono - Mono sum
- L/L - Left as mono source to both sides
- R/R - Right as mono source to both sides
- M/S - Mid/Side decode to stereo with the first input of the pair acting as the MID signal and the second signal of the pair acting as the SIDE signal.

Width adjusts the Stereo Image from 0% (mono) to 100% (stereo).

5.1.4. Gate/Ducker

The processor can be set to either Gate or Ducker mode, on a per channel basis, depending on the application.

Click the Side Chain Source box to open a window for selecting the Key (trigger) input to the Gate/Ducker. An adjustable BPF, HPF and LPF or shelf can be switched in to limit the frequency range of the Key signal. The curve turns yellow when the filter is switched in.

In Gate mode, threshold sets the level at which the gate opens to let the signal through. The meter on the left lines up with the graph and shows the signal at the input to the gate. The gain reduction meter on the right shows when the gate is closed. Depth sets how much the signal is attenuated when the gate closes. Attack, Hold and Release set how fast the gate opens when the signal rises above the threshold, how long it is held open after the signal falls below the threshold, and how long it takes to attenuate after it closes.

In Ducker mode, threshold sets the level at which the ducker begins to attenuate the signal. The meter on the left lines up with the graph and shows the signal at the input to the ducker. The gain reduction meter on the right shows when the ducker is attenuating the signal. Depth sets how much the signal is attenuated when the threshold is reached. Attack, Hold and Release set how fast the ducker attenuates when the signal rises above the threshold, how long it is attenuated for and how long it takes to recover after the signal falls below the threshold.

A histogram shows activity over time.

Click In to switch the gate/ducker in or out of the signal path.

Use Copy To... and Copy From... to copy the current Gate/Ducker settings to/from another channel, or click Library to store/recall a Gate/Ducker Library preset.

5.1.5. Inserts

External equipment/plugins or additional processing from the expansion module can be inserted into the signal path of an Input channel or a Zone.

Input channels provide two Insert points:

- Insert A = Post Gate/Pre PEQ
- Insert B = Post Comp/Pre Delay
- Use the drop-down menus to assign the Send and Return to local sockets, SLink I/O or the I/O Port.
- Choose the Operating Level of the insert point:
- Digital sends the signal at 0dB for use with external digital equipment via I/O Ports.
- Analogue compensates for the +4dBu nominal level on balanced analogue outputs, so that the overall gain of the insert circuit is 0dB.
- -10dBV is the standard for consumer equipment.

Click Unassign Send/Return to clear the current Insert assignment.

Click In to switch the inserted device in circuit.

This screen is also used to insert and control AEC (Acoustic Echo Cancelling) when the AEC expansion module is fitted. One insert sits in the far-end Input, and the other in the near-end Input.

Click Assign AEC to assign. For more information on AEC setup and settings, click here.

5.1.6. PEQ

The Parametric Equaliser provides 8 fully adjustable bands of equalisation.

Click and drag the 8 band dots to adjust their centre frequencies. Click and drag the HPF / LPF dots to adjust their cut-off frequencies. The overall frequency response curve turns yellow when the PEQ is switched in and grey when switched out.

Each of the 8 bands can be set to:

- Bell - Gain range of +/- 15dB with Q values between 0.5 – 12.00.
- Bell Const Q - Gain range of +/- 15dB with Q values between 0.5 – 12.00. Q is constant throughout gain range.
- LF Shelf / HF Shelf - Classic Baxandall curve
- LPass / HPass – 12dB/octave slope
- Notch – Notch filter with adjustable width

Freq sweeps the shelving, centre or cut-off frequency for each band. Q adjusts the width in octaves of the bell-shaped EQ band. Gain allows up to +/-15dB boost or cut for each band.

Click Band In to turn the selected PEQ band on or off. Shift-click the band selection to toggle the Band In state.

Click In to switch the PEQ in or out of the signal path.

To return the PEQ to its default state, click Reset.

Use Copy To... and Copy From... to copy the current PEQ settings to/from another channel, or click Library to store/recall a PEQ Library preset.

Use Multi to edit multiple PEQs simultaneously. See the EQ Ganging section.

5.1.7. Comp

Click the Side Chain Source box to open a window for selecting the Key (trigger) input to the compressor. An adjustable BPF, HPF and LPF or shelf can be switched in to limit the frequency range of the Key signal. The curve turns yellow when the filter is switched in.

The compressor can operate in either Peak or RMS mode depending on the application.

Attack and Release control how fast the compressor pulls back the signal when it exceeds the threshold and how long it takes to let go when the signal drops below the threshold.

Soft Knee adds compression gradually with gentler ratio as it approaches the threshold.

Ratio sets the amount of compression when the signal exceeds the threshold. A ratio of 1:1 means no compression. Set Ratio to 'Infinite' to use the compressor as a limiter.

Threshold sets the level at which the compression starts. The meter on the left is aligned with the graph and shows the signal at the input to the compressor. The gain reduction meter on the right shows how much the signal is being compressed.

Gain is the make-up gain to compensate for the drop in overall volume after compression.

A histogram shows compressor activity over time.

Click In to switch the compressor in or out of the signal path.

Use Copy To... and Copy From... to copy the current Comp settings to/from another channel, or click Library to store/recall a Comp Library preset.

5.1.8. Delay

Delays can be adjusted up to 683ms.

The default unit is milliseconds (ms) but this can be changed per channel type (Input/Zone) to metres, feet or samples.

Click the In button to toggle the delay in or out.

Click Reset to revert the delay time to 0.

Use Copy To... and Copy From... to copy the current Delay value to/from another channel, or click Library to store/recall a Delay Library preset.

5.1.9. AMM

Configure the Automatic Microphone Mixers (AMM).

Settings - Global

Click on the Settings tab to configure the global AMM settings.

Select the Number of AMMs from the dropdown. Each AMM can be assigned a unique set of Input channels. Up to 4 AMMs can be configured for AHM-32, and up to 8 for AHM-64. A single AMM is available for AHM-16.

The AMM Side Chain Filter enables the activation of High Pass and Low Pass filters to cut off frequencies, below and above the normal speech range, that may cause the false triggering of the microphones.

When Follow Fader is enabled, channel faders will affect the signal levels sent to the AMM.

Select an AMM Mode to globally switch all AMMs to D-Classic or NOM mode.

Settings – Number of Open Microphones (NOM) Mode

When NOM mode is selected, additional settings are shown.

NOM mode acts as a gate, turning an Input on when a threshold is passed. The level adjustment for each open Input is equal and depends on the number of microphones open and the NOM attenuation parameter which sets the amount of attenuation applied for every doubling of open microphones.

You do not need to set the open mic threshold. NOM mode senses the background ambient noise level and automatically adjusts the open threshold level to ensure consistent triggering regardless of background noise.

Ambience Maintenance keeps the last open microphone locked on until another channel is opened to ensure consistent ambient noise is maintained, especially important in a broadcast environment. If just one microphone is active in the AMM then it is held open to maintain ambience.

Off Attenuation sets the amount of shutoff for closed mics (from -10dB to -90dB).

On Hold Time sets the amount of time an open mic is held open once the trigger is removed (from 1 to 5 seconds). The Chair mic is not affected by Hold Time.

NOM Attenuation sets the amount of attenuation applied per doubling of open mics (from 3 to 6dB).

Chair Sensitivity sets the sensitivity of signal required to trigger a Chair mic open and therefore duck the other mics (from 1 to 10 = least to most sensitive).

Chair Duck Level sets the amount of attenuation applied to other mics when a Chair mic is open (from -3 to -40dB)

AMM Screen – NOM Mode

On - When switched to 'ON' the AMM takes automatic control using its own gain element just after each fader.

Chair - You can set a channel as 'Chair' to give it higher priority over the other channels, for example to let a chairman override another speaker. The Chair mic sensitivity and the amount that other channels are automatically ducked when the Chair is open can be set.

Solo - Each Input has a solo option which opens the selected channel and turns all others down. This is not additive. Only one channel can be soloed at a time.

Click on Set Assigned Inputs to select the Input members for the selected AMM.

The selected AMM can be turned on or off using the Active button.

Best Mic - This option ensures a single participant activates the one microphone receiving the strongest signal. This can prevent crosstalk, phasing and ambience issues caused by multiple microphones triggering for the same voice. The Chair mic is not part of the Best Mic On calculation.

We recommend you only select Best Mic if all microphones involved are the same type and have similar positioning and gain.

AMM Screen – D Classic Mode

Unlike NOM mode which uses gating and fixed gain attenuation, D-Classic uses a 'constant gain sharing' algorithm to dynamically adjust the gain for each mic proportional to its Input level. Louder signals will receive more gain in the mix.

Priority Level - For each channel you can set a priority 'level' which will offset the amount of gain going into the mix calculation and therefore give a higher or lower artificial gain to that channel. This is a variable slider with a range from -15dB (low priority) through 0dB (no offset) in the middle to +15dB (high priority) at the top.

On - When switched to 'ON' the AMM takes automatic control using its own gain element just after each fader. D-Classic does not provide Best Mic On, Solo, Chair or other setup functions

Click on Set Assigned Inputs to select the Input members for the selected AMM.

The selected AMM can be turned on or off using the AMM Active checkbox.

5.1.10. Level

An onscreen fader can be used to change the level of the audio. Click and drag the fader to alter the volume. Hold SHIFT and click/drag the fader to change the level in 5dB increments.

Right-click on a fader to see the options for Set to Zero and Set to -Inf.

Alternatively, double click in the value box below the fader to enter a value using your keyboard.

A Mute button is located below the fader to mute the channel.

5.1.11. XPoint Routing

Send levels from the selected channel to assigned Zones are shown.

Click and drag a Zone fader to change the send level from the currently selected channel. Hold SHIFT and click/drag the fader to change the level in 5dB increments.

Right-click on a fader to see the options for Set to Zero and Set to -Inf.

Alternatively, double click in the value box below the fader to enter a value using your keyboard.

A Mute button is available for each Zone send.

Click on Edit Routing to configure the routing assignment from the selected channel to the available Zones. Click on a Zone to toggle the routing between on and off – the Zone will be highlighted when routing is turned on. Click on the row buttons to turn routing on or off for a row of Zones.

5.2. Zones

This screen shows the Zone channels and their processing blocks. Click on a processing block to edit.

5.2.1. Hot Keys

A number of Hot Keys are available for fast navigation of the Channel view in System Manager

- Ctrl + Click - Toggle In/Out status on channel processing blocks
- Arrow Keys - Left/Right keys change the processing block being viewed and Up/Down keys select the previous/next channel
- Right Click Name block - Change the colour of a channel via right click on the Channel name/colour block
- Right Click PEQ block - Opens a PEQ Quick View window. Use Ctrl/Cmd + Right Click on other channel's PEQs on the same page to temporarily gang the EQs together. See the EQ Ganging section for more information.
- Right Click Level block- Set the level to 0dB or -inf and toggle mute via right click on the Channel Level block.
- Right Click on any fader to set a level.

5.2.2. Name

Name the Zone and select a colour for easier identification.

Click Library to store the current Zone processing settings as a Library preset, or to recall an existing one. Zone Libraries store Source Selector, PEQ, GEQ/PEQ, Compressor and Delay settings. They do not store the channel name or colour, Priority Inputs, Insert, level/mute or routing.

5.2.3. Selector

Configure a source Selector with up to 20 slots that can be controlled via IP Remote Controllers, front panel controls or external control. Each slot can contain an Input channel, for example a media player or TV output, a Control Group or a Preset.

Audio Inputs assigned to Selector are mutually exclusive in the Zone output. For example, while a channel is selected and sending audio to the Zone, all other channels in the selector have a level of -inf in the Zone. A channel XPoint can be manually adjusted in the Zone regardless of the selector status, but this does not override the selector.

Any sources added to a Selector should also be routed to the Zone in XPoint Routing and should not be muted.

Click Add Sources to add an Input channel or Control Group to the Selector. Click Add Preset to add a Preset to the Selector. Any combination of up to 20 Presets and Input channels can be added to the Selector.

Once the Selector is populated, click on a slot to configure it.

A Name and Colour can be assigned to the Input or preset in the Selector without affecting the original name and colour.

To change the Input channel assigned to a source, use the Input dropdown.

The On Level is used to set the level of the Input source when it is selected.

To change the order of the slots in the Selector, use the Move Up and Move Down buttons. Click Remove to remove a source from the list.

Specify Fade In and Fade Out times to ensure a smooth transition between audio sources.

Current Active Source shows the currently selected source in the Zone. Use the dropdown menu to change the active source.

Note that any Input or Group routed to the selected Zone but not selected as a member will not be affected by the Selector. This allows for a priority mic, paging, announcement or alarm system to be always routed to the Zone regardless of the active source in the Source Selector.

Use Copy To... and Copy From... to copy the current Selector settings to/from another Zone or click Reset to reset to factory settings.

5.2.4. Priority Inputs

A Priority Input will trigger the ducking of all other Inputs to the Zone once a threshold is exceeded.

Paging can be used in conjunction with Priority Inputs to enable ducking of other Inputs to the Zone(s) when paging is active.

AHM-16 can specify one Priority Input per Zone. With AHM-32 and AHM-64, two Priority Inputs can be specified per Zone, with Priority Input 1 having priority over Priority Input 2.

Click a Priority Input dropdown to see the list of available Inputs. Select an Input to assign it to a Priority Input or click Unassigned to remove an Input.

Any Inputs assigned as Priority Inputs should be routed to the Zone as normal and should not be muted.

Click Configure to access the settings for the Priority Input.

Threshold sets the level at which the Priority Input triggers ducking of all other Inputs to the Zone. The meter on the left lines up with the graph and shows the signal at the input to the gate. Depth sets how much ducking is applied to other signals in the Zone when the threshold is exceeded. Release sets how long it takes to the ducker to return to normal levels.

Note that these settings apply to the Input and are not Zone specific. If the same Priority Input is used in multiple Zones, the settings apply to all instances of the Priority Input.

5.2.5. XPoint Routing

Send levels to the currently selected Zone, from assigned Inputs, Zones or AEC SR (Sound Reinforcement) outputs are shown.

Click and drag a fader to change the send level to the currently selected Zone. Hold SHIFT and click/drag the fader to change the level in 5dB increments.

Right-click on a fader to see the options for Set to Zero and Set to -Inf.

A Mute button is available for each Zone send.

Click on Edit Routing to configure the routing assignment to the selected Zone from Input channels and other Zones. Click on an Input or Zone to toggle the routing between on and off – the Input/Zone will be highlighted when routing is turned on. Click on the row buttons to turn routing on or off for a row of Inputs/Zones.

5.2.6. Inserts

External equipment/plugins can be inserted into a channel or Zone.

Zones provide one Insert point which is pre-PEQ.

Use the drop-down menus to assign the Send and Return to local sockets, SLink I/O or the I/O Port.

Choose the Operating Level of the insert point:

- Digital sends the signal at 0dB for use with external digital equipment via I/O Ports.
- Analogue compensates for the +4dBu nominal level on balanced analogue outputs, so that the overall gain of the insert circuit is 0dB.
- -10dBV is a standard for consumer equipment.

Click Unassign Send/Return to clear the current Insert assignment.

Click In to switch the inserted device in circuit.

5.2.7. PEQ

The Parametric Equaliser provides 8 fully adjustable bands of equalisation.

Click and drag the 8 band dots to adjust their centre frequencies. Click and drag the HPF / LPF dots to adjust their cut-off frequencies. The overall frequency response curve turns yellow when the PEQ is switched in and grey when switched out.

Each of the 8 bands can be set to:

- Bell - Gain range of +/- 15dB with Q values between 0.5 – 12.00
- Bell Const Q - Gain range of +/- 15dB with Q values between 0.5 – 12.00. Q is constant throughout gain range.
- LF Shelf / HF Shelf - Classic Baxandall curve
- LPass / HPass – 12dB/octave slope
- Notch – Notch filter with adjustable width

Freq sweeps the shelving, centre or cut-off frequency for each band. Q adjusts the width in octaves of the bell-shaped EQ band. Gain allows up to +/-15dB boost or cut for each band.

Click Band Into turn the selected PEQ band on or off. Shift-click the band selection to toggle the Band In state.

Click In to switch the PEQ in or out of the signal path.

To return the PEQ to its default state, click Reset.

Use Copy To... and Copy From... to copy the current PEQ settings to/from another channel, or click Library to store/recall a PEQ Library preset.

Use Multi to edit multiple PEQs simultaneously. See the EQ Ganging section.

5.2.8. GEQ / PEQ

Select between a GEQ, or an additional PEQ.

The PEQ is the same specification as the Zone PEQ in the previous block.

5.2.9. GEQ

A 28-band 1/3 octave Graphic Equaliser is provided on each of the Zone outputs, offering symmetrical cut/boost (+/- 12dB) where the width (Q) of the filter is a constant 1/3rd octave for any amount of cut or boost. Click and drag a frequency fader to adjust the gain of that frequency band.

The top area of the GEQ shows the combined frequency response curve of the GEQ. The curve turns yellow when the GEQ is switched in, and grey when the GEQ is disabled. An RTA of the monitor signal, with peak band indication, is superimposed on the graph.

Click In to switch the GEQ in or out of the signal path.

Click Reset to revert all GEQ faders to 0.

Use Copy To... and Copy From... to copy the current GEQ settings to/from another channel, or click Library to store/recall a GEQ Library preset.

5.2.10. Comp

Click the Side Chain Source box to open a window for selecting the Key (trigger) input to the compressor. An adjustable BPF, HPF and LPF or shelf can be switched in to limit the frequency range of the Key signal. The curve turns yellow when the filter is switched in.

The compressor can operate in either Peak or RMS mode depending on the application.

Attack and Release control how fast the compressor pulls back the signal when it exceeds the threshold and how long it takes to let go when the signal drops below the threshold.

Soft Knee adds compression gradually with gentler ratio as it approaches the threshold.

Ratio sets the amount of compression when the signal exceeds the threshold. A ratio of 1:1 means no compression. Set Ratio to 'Infinite' to use the compressor as a limiter.

Threshold sets the level at which the compression starts. The meter on the left is aligned with the graph and shows the signal at the input to the compressor. The gain reduction meter on the right shows how much the signal is being compressed.

Gain is the make-up gain to compensate for the drop in overall volume after compression.

A histogram shows compressor activity over time.

Click In to switch the compressor in or out of the signal path.

To return the Comp to its default state, click Reset.

Use Copy To... and Copy From... to copy the current Comp settings to/from another channel, or click Library to store/recall a Comp Library preset.

5.2.11. Delay

Delays can be adjusted up to 683ms.

The default unit is milliseconds (ms) but can be changed to metres, feet or samples.

Click the In button to toggle the delay in or out.

Click and drag on the Delay value to change it. Alternatively, double-click to enter the value on your keyboard.

Click Reset to revert the delay time to 0.

Use Copy To... and Copy From... to copy the delay value to another channel, or to copy another channel's delay value to the current channel.

5.2.12. ANC

The Ambient Noise Compensator (ANC) automatically changes a controlled gain element to compensate for changes in background (ambient) noise levels.

The Ambient Level Sampling Active soft-LED illuminates when the ANC is sampling the ambient level.

Ambient Level Metering Point

The Ambient Level Metering Point allows the selection of a Channel where the ambient level is sampled. Typically, a boundary microphone is used for ambient noise detection in a Zone.

A pick-off point for the metering is selected via the Meter Point dropdown with options for Post Trim, Post PEQ, and Post Delay.

Gain Differential sets the difference between the ambient level (as displayed on the ambient level meter in dBu) and the 'Controlled Gain Element' fader gain level in dB as shown on the fader scales. The Gain Differential can be set between -18dB and +40dB.

For example, an ambient level of -30dBu with a gain differential of 10dB will set the master fader level of the Zone to -20dB on the scale. As the ambient level changes, the controlled fader level will 'ride' 10dB higher than the ambient level.

Controlled Gain

Under Controlled Gain, the Min Gain and Max Gain values determine the operating range of the gain compensation for the Zone.

The Rate value, expressed in dB per second, determines the rate at which the controlled element gain changes in response to a change in the ambient level.

Gap Metering

Gap Metering selects the point from which the ANC ambient sampling and gain control program is triggered.

The Threshold value sets the level below which the program gap signal must fall before the ANC starts sampling the ambient level.

The Time value determines the amount of time between the program gap signal falling below the program gap threshold and the start of ambient level sampling.

To return the ANC to its default state, click Reset.

Use Copy To... and Copy From... to copy the current ANC settings to/from another channel.

5.2.13. Level

An onscreen fader can be used to change the level of the audio, click and drag the fader to alter the volume. Hold SHIFT and click/drag the fader to change the level in 5dB increments.

Right-click on a fader to see the options for Set to Zero and Set to -Inf.

Alternatively, double click in the value box below the fader to enter a value using your keyboard.

A Mute button is located below the fader to mute the channel.

5.2.14. Speaker Processing

Configure the crossovers on the current Zone.

To add or remove crossovers on the selected Zone, click the Number of Ways dropdown and select the required configuration, or click on Open Zones Configuration to set crossover ways for all Zones and display the number of available processing outputs.

A Mono Sub option is available on stereo Zones which provides a mono summed output for the low crossover band when enabled.

A graph with dB (-30 to 0dB) on the vertical axis and frequency (20Hz-20kHz) on the horizontal axis is displayed for visualisation of the crossovers.

A crossover node is displayed for each crossover point - ⊗

The crossover frequency is displayed in Hz below the graph. Double click the frequency figure to enter a crossover frequency via your keyboard or click and drag the blue bar below the figure to change the crossover frequency. Alternatively, click and drag a crossover node on the graph to change the crossover frequency of a band.

Use the Linked button to unlink the crossover bands, enabling the ability to change the crossover frequency of each band independantly.

Each band has a choice of filter types for the High Slope and Low Slope;

- Butt 12 – Butterworth filter with a 12dB/oct slope
- Butt 18 – Butterworth filter with a 18dB/oct slope
- Butt 24 – Butterworth filter with a 24dB/oct slope
- Butt 48 – Butterworth filter with a 48dB/oct slope
- L-R 12 – Linkwitz-Riley filter with a 12dB/oct slope
- L-R 24 - Linkwitz-Riley filter with a 24dB/oct slope
- 1st Order – First Order filter with a 6dB/oct slope

An All-Pass filter is available for each band. Click All Pass to open the All Pass filter window. Click IN to turn the All-Pass filter on or off. Choose the Type of filter between 1st Order and 2nd Order. Click and drag Freq to select the frequency and Q to select Q values between 0.5 – 12.00. Click Invert to change the polarity of the filter.

A GEQ/PEQ is available for each band. Refer to the Zone GEQ/PEQ section for more information on the controls.

A Delay is provided for each band. Click IN to turn the delay on or off. Click and drag the delay time to increase or decrease the delay time. Alternatively, double click the delay time and enter a delay value using your keyboard. You can change the unit used for crossover delays. The options are ms, metres, feet and samples.

Each band has a dedicated Level, Polarity button and Limiter, separate from the main Zone level and limiter. Click on the Limiter icon to access its settings. The limiter can be switched in or out by clicking IN. The Attack, Release and Threshold times can be specified by clicking and dragging the value, or by double clicking and entering a value with your keyboard. Additionally, the Threshold can be configured by clicking and dragging the threshold node on the graph.

To return Speaker Processing to its default state, click Reset.

Use Copy To... and Copy From... to copy the current Speaker Processing settings to/from another Zone. This only successful if there are enough spare output processing channels available.

Click Library to store/recall a Speaker Processing Library preset. Speaker Processing Libraries can only be recalled when the number of crossovers match. For example, it is not possible to recall a 2-Way XOver Library in a 3-Way XOver.

5.3. Outputs/Limiters

5.3.1. Limiter

A Limiter is provided on all Zone channels.

Click and drag to select the Attack and Release times. Attack times can be set between 40µs (microseconds) and 400ms (milliseconds), and Release times can be set between 50ms and 1000ms.

The Threshold value determines when the limiter is activated, click and drag the node in the graph or the Threshold value box to change the value.

Click In to switch the Limiter in or out of the signal path.

To return the Limiter to its default state, click Reset.

Use Copy To... and Copy From... to copy the current Limiter settings to/from another channel, or click Library to store/recall a Limiter Library preset.

5.3.2. Output

View and change the output patch for the selected Zone.

If the Zone has been configured with crossovers, the output patch for the crossover outputs will also be visible.

5.4. EQ Ganging

Multi opens the PEQ MultiEdit view.

Click Select PEQs to select which PEQs to include in the MultiEdit window. Any PEQ from Inputs, Zones and Speaker Processing XOver Ways can be included in this.

Use Columns to configure the number of columns in the MultiEdit window.

The Primary PEQ is displayed at the top of the window and is highlighted in the selected PEQ grid.

Use Ctrl/Cmd + Click on a PEQ in the grid to change the Primary PEQ

Use Left Click on a PEQ in the grid to exclude/include it for editing.

Use Right Click on a PEQ in the grid to choose from the following options:

- Exclude only: Exclude this PEQ from editing.
- Include only: Make this the only PEQ to be edited by the primary PEQ.
- Include All: Include all PEQs in the grid for editing.
- Set As Primary: Set this PEQ as the primary.

Mode options change how EQ Ganging affects the selected PEQs.

Relative: Changes settings relative to current settings across selected PEQs. (E.g., An EQ band with a gain value of +5dB will be taken to +8dB when the Primary PEQ adds 3dB of gain.)

Absolute: Sets an absolute value on all selected PEQs. (E.g., An EQ band with a gain value of +5dB will be taken to +3dB when the Primary PEQ is set to +3dB of gain.)

Mirror: Copies values and settings of the Primary PEQ to all selected PEQs.

Use Undo/Redo to quickly compare between changes. This also affects changes to the Mode to undo an accidental Mirror change.

5.5. Control Groups

Specify the members and control the levels of Control Groups.

Faders are shown for all 32 Control Groups. Click and drag a fader to change the level between -inf and +10dB. Alternatively, double click in the value box below the fader to enter a value using your keyboard.

Below the faders you can name the Control Group and select a colour for easier identification.

To view or change the currently assigned Inputs, click on Edit Assigned Inputs.

To view or change the currently assigned Zones, click on Edit Assigned Zones.

To view or change crosspoint (XPoint) assignments, use the Assign/XPoints screen.

5.6. I/P Direct Outs

Control the Direct Out levels of all Input channels.

Faders are shown for all Input channels. Click and drag a fader to change the Direct Out level between -inf and +10dB. Hold SHIFT and click/drag the fader to change the level in 5dB increments.

Right-click on a fader to see the options for Set to Zero and Set to -Inf.

Alternatively, double click in the value box below the fader to enter a value using your keyboard.

Use the Global IP Direct Output Source dropdown to select the source point for all Direct Outs.

By default, Direct Out levels are not affected by fader levels or mutes on Input channels and Control Groups. However, Direct Outs can be globally configured to:

- Follow All (Ctrl Grp Fader/Mute, Channel Fader/Mute) – the Direct Out level will be affected by Control Group faders, Control Group mutes, Input channel faders and Input channel mutes.
- Follow Channel Fader – the Direct Out level will be affected by the Input channel fader
- Follow Channel Mute – the Direct Out will be muted if the Input channel is muted

6. AEC (Acoustic Echo Cancelling)

6.1. Requirements

AEC requires the M-AHM-64 / M-AHM-32 expansion module and AHM System Manager and firmware V1.10 (AHM-64) / V1.20 (AHM-32) or higher.

AEC is not available for AHM-16.

6.2. Concept

AEC is applied using channel Inserts. One Insert sits in the far-end Input channel (e.g. the remote caller), and the other in the near-end Input channel (the local microphone).

Use Insert B for the far-end channel. This ensures the signal is after dynamics processing, for example compression. The AEC filter will not work if there is non-linear processing on the far-end source between the AEC and the speaker.

Use Insert A for the near-end channel. This ensures the signal is before any dynamics processing. The gate in the near-end Input channel must be disabled.

A Sound Reinforcement (SR) output is also provided. This gives an additional output prior to any talk-state gating or comfort noise, so the near-end signal can be mixed to a local speaker in the local room for voice reinforcement applications. SR outputs appear as additional sources labelled AEC SR Returns in the Zone XPoint routing screen found under Assign > XPoints.

6.3. Assignment

Start with the far-end Input channel. Go to Insert B and click Assign AEC (far-end). Select an available AEC processor. AECs that are already in use will be greyed out.

To assign the near-end, choose the source in the Near End Assign drop down box. Alternatively, go to Insert A in the near-end Input channel and click Assign AEC (near-end).

Use the Go to button in the lower panel to switch between the near-end and far-end Insert screens.

6.4. Far-end controls

Adjust the Trim control so that the meter shows around 0dB with a typical far-end source. This is critical for good AEC performance.

Choose Auto to enable AGC (Automatic Gain Control) on the far-end source.

The far-end Insert screen shows the AEC reference meter.

6.5. Near-end controls

Adaptive Filter enables and controls the speed of the adaptive filter. Set to the lowest value that gives acceptable performance for the application.

Echo Reduction enables and controls non-linear processing to further reduce echo. Set to the lowest value that gives acceptable performance. A high value can cause the far-end caller to hear distortion.

Noise Reduction enables and controls non-linear processing to reduce background noise from the local room. Set to the lowest value that gives acceptable performance. A high value can cause the far-end caller to hear distortion.

Far-only Ducker attenuates the near-end signal when only the far-end is talking.

Comfort Noise controls the level of an unobtrusive noise sent to the far-end caller. This ensures that the caller never hears a totally silent line, which can give the impression of a connection drop.

The near-end Insert screen shows the AEC output meter (after echo cancellation)

6.6. Multiple microphone setups

To set up a multi-mic system, click Add AEC (Multi-Mic) and select more AEC processors to assign the near-end Input channels as required.

7. Assign

The Assign screens allow patching of signals to system outputs and the assignments of Inputs and Zones to crosspoints (XPoints) and Control Groups.

To zoom in or out on the grid use the mousewheel. To zoom in with the cursor as the target, press CTRL and use the mousewheel. Click and drag to move the grid.

Clicking on a crosspoint (XPoint) will highlight the crosspoint which indicates that the patch or crosspoint is enabled. Click again to disable the patch or crosspoint.

To assign multiple I/O or crosspoints (XPoints) at once:

- Hold down SHIFT, click on a crosspoint and drag to draw a line on the grid
- Hold down SHIFT+CTRL (SHIFT+CMD on macOS), click on a crosspoint and drag to draw a box on the grid (XPoints and Control Groups only)

7.1. I/O Patchbay

Use this screen to patch Inputs and outputs from / to analogue sockets, the I/O Port and the SLink port.

The patch is presented as a matrix view with solid cross-points indicating an active connection.

Click on a physical input number to open a socket pop-up window. Gain, Pad and +48V can be configured for analogue inputs.

Click on a physical output number to open a socket pop-up window. The Polarity can be reversed.

An input or output shown in grey indicates that it is not present on the system.

7.1.1. Zones

Select Zones to patch Zones (vertical axis) to local or remote outputs (horizontal axis)

Select which outputs are visible by selecting from Local Outputs, I/O Port or SLink Outputs.

7.1.2. Direct Outs

Select Direct Outs to patch Input channel direct outputs (vertical axis) to local or remote outputs (horizontal axis). Select which outputs are visible by selecting from Local Outputs, I/O Port or SLink Outputs.

7.1.3. Monitor Outs

Select Monitor Outs to patch monitor outputs (vertical axis) to local or remote outputs (horizontal axis). Select which outputs are visible by selecting from Local Outputs, I/O Port or SLink Outputs.

7.1.4. Input Channels

Select Input Channels to patch input sources (horizontal axis) to Input processing channels (vertical axis). Select which input sources are visible by selecting from Local Inputs, Playback, I/O Port or SLink Inputs.

7.1.5. Tie Lines

Use Tie Lines to patch any source (horizontal axis) directly to one or multiple destinations (vertical axis), without impacting on mix resources or Zone configuration.

Select which input sources are visible by selecting from Local Inputs, Playback, I/O Port, SLink Inputs or SigGen.

Select which outputs are visible by selecting from Local Outputs, I/O Port or SLink Outputs.

7.2. XPoints

Use this screen to assign crosspoints (XPoints) from Inputs to Zones, or from Zones to Zone.

- Grey crosspoints indicate an enabled crosspoint.
- Black crosspoints indicate a crosspoint is not enabled.

Click Show Fader/Mute for a visual representation of the crosspoint (XPoint) level and mute Connection Status in the matrix view. A red crosspoint indicates the crosspoint mute is active. Right-click on a crosspoint to see options for Set to 0dB, Set to -Inf dB and Toggle Mute.

Select Input/Zone to assign from Input channels (vertical axis) to Zones (horizontal axis).

Select Zone/Zone to assign from Zones (vertical axis) to Zones (horizontal axis).

Select AEC/Zone to assign from AEC SR (Sound Reinforcement) outputs (vertical axis) to Zones (horizontal axis).

7.3. Control Groups

Use this screen to assign Inputs, Zones and crosspoints (XPoints) to any of the 32 Control Groups.

7.3.1. Inputs in Groups

Assign Input channels (vertical axis) to Control Groups (horizontal axis)

A grey crosspoint (XPoint) indicates the Input is assigned to the Control Group.

A black crosspoint indicates the Input is not assigned to the Control Group.

7.3.2. Zones in Groups

Assign Zones (vertical axis) to Control Groups (horizontal axis)

A grey crosspoint (XPoint) indicates the Zone is assigned to the Control Group.

A black crosspoint indicates the Zone is not assigned to the Control Group.

7.3.3. XPoints in Groups

Assign crosspoint (XPoint) levels to Control Groups.

Click on the box next to XPoints in Groups to choose the currently active Control Group. For example; if Group 1 is selected, all visible crosspoint (XPoint) assignments on the matrix will be members of Group 1. Select a crosspoint from an Input channel (vertical axis) to a Zone (horizontal axis) to assign the crosspoint to the currently selected group.

Select Combined to assign crosspoints (XPoints) to multiple Control Groups simultaneously. When Combined is selected, clicking on a crosspoint will open a new dialog box. Select one or more groups and hit OK.

For example; select the Input 1 to Zone 1 crosspoint and then select Groups 1-8 and hit OK. The Input 1 to Zone 1 crosspoint is now assigned to Control Groups 1-8.

7.4. Monitoring

A 31 band 1/3 octave Real Time Analyser for the currently monitored signal is provided.

The monitor output level can be changed via the onscreen fader and Mute button.

The currently monitored signal is displayed in the Status Bar (Monitor Point) and follows the mouse pointer and active window.

Patch the monitor output to a physical output – Local, SLink or I/O Port – in the Assign-> I/O Patchbay screen.

8. Room Combiner

A Room Combiner is available and can be used to combine and divide the audio routed to up to 16 rooms.

8.1. Rooms

Rooms in the Room Combiner are a visual representation of the floor plan of the building, multifunction room or space that requires the audio to be combined or divided.

Each Room must be assigned to a Zone. When a Room is not combined with any other Room, the assigned Zone behaves normally.

When rooms are combined, the output of the Zone assigned to the master Room (lowest-numbered Room) becomes the only source fed to the Zone/s of any combined room.

Rooms can be combined via the Room Combiner interface in System Manager, Custom Control (V1.4 or higher), external control (TCP), IP controllers, GPI or the front panel SoftKeys. When combined by IP controllers or front panel SoftKeys, a Preset can be optionally recalled for the combined and divided states. This could be useful if other Zone parameters other than routing need adjusting, for example the output EQ or delay.

8.2. Room Combiner Layout

The Room Combiner layout displays the floor plan and buttons to combine or divide adjacent rooms.

8.3. Configure Rooms

The Configure Rooms page displays a grid for drawing the floor plan and creating rooms. The layout should match the physical floor plan of the rooms you want to control with the Room Combiner. Select the room number at the bottom of the page and click on a cell in the grid to create a room. Right click to clear individual cells. Draw and clear rooms freely while holding the left or right mouse button.

- Clear Layout clears all rooms from the room combiner.
- Centre Layout positions the floor plan in the centre of the grid.

Click Apply when the room configuration is complete.

8.3.1. Assign Zones

Once the layout reflects the floor plan of the rooms, each room must be assigned a Zone. The name of the Zone will be displayed for the assigned Room.

8.4. Party/Non-Party Controls

Rooms that are adjacent to each other share a party wall. These rooms can be combined using the Room Combiner interface via the buttons on the wall or via the buttons on the right of the page.

Non-adjacent Rooms can only be combined using the buttons on the right of the page in System Manager. Select the Room from the drop down to view the available Party/Non-Party combiner buttons. Other control options, such as IP Controllers or Custom Control, allow both Party and Non-Party combinations.

Combining rooms will take the audio from the lowest number room. For example, combining room 1 & 2 will route the audio from room 1 to room 2. It is not possible to route the audio from room 2 to room 1. This should be considered when configuring Rooms.

8.5. Room Level and Room Source Selector functions

IP Controllers, Custom Control and front panel SoftKeys can be set to control a Room Level or a Room Source Selector. This means that any controller in combined rooms would be linked automatically and control the level / Source Selector of the Zone assigned to the master Room (lowest-numbered).