

Delta Series, DPA Series, APA Series

AudioCore Amped Edition: What's new...



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Introduction

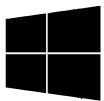
AudioCore is XTA's mature remote control software application, that runs under Windows operating system and offers advanced control and monitoring facilities for an array of XTA signal processing devices.

The Amped Edition is an extension of this application and is designed to monitor and control the Delta Series DSP amplifiers from MC² and the APA and DPA Series amplifiers from XTA.

It does not replace the latest release of AudioCore available on the XTA website, as it does not support XTA signal processor control (DP224/6/6i/DC1048/4 Series/5 Series and all OEM variants).

It primarily connects to devices using an Ethernet data connection, although it will also connect via a USB connection or RS485 (with suitable converter).

The software has been tested for compatibility with the following Windows versions:



Windows XP

Windows 7: 32 and 64 bit editions

Windows 8.1

Windows 10: 32 and 64 bit editions



Are you a mac user?

If you would like to experience remote control of your amplifiers on an iPad, please search for and download DeltaDirect from the App Store.

Purpose of this Guide

This document is designed to introduce the new features and concepts that are included in the Amped Edition of AudioCore. It assumes familiarity with the use of AudioCore for editing DSP parameters. If you are unfamiliar with AudioCore, please download the user manual from our website here:

<http://www.audiocore.co.uk/wp-content/uploads/2014/04/Audiocore-Manual-Version-8.40.pdf>

Please ensure that your amplifiers have the required firmware running to ensure that you experience the best possible performance from the software. Details of the firmware and software versions required are kept up to date on both MC²'s and XTA's websites.

If you have any questions about anything in this guide please email us at tech@xta.co.uk.

Thanks and we hope you enjoy using it!

Hardware Set-up – Delta and DPA Amplifiers

Your amplifier is equipped with multiple options for remote control. It can operate as a single device via a USB connection to the front panel, and this can also be used as a converter to an RS485 network, where other Delta/DPA amplifiers may be connected.

It may also be controlled via an Ethernet connection and again will relay data onto an RS485 network if required.

The Ethernet and USB connections can be used in an intelligent switchover mode, where the Ethernet connection is active, but will be overridden by a USB connection, allowing quick connection to a system via the front panel without needing to reconfigure the current remote interface setup.

The RS485 network can be used on its own as third means of communication, if the amplifier is part of a bigger system and an Ethernet connection is not available.

Using an Ethernet connection, multiple amplifiers can be connected directly to a standard Ethernet switch, or WiFi router, allowing for wireless communication. Connection to a WiFi router is required to control amplifier(s) with the DeltaDirect app.

Remote Control Software Choices

Your amplifier is designed to be fully configured via AudioCore, our fast, intuitive software platform that works alongside the DeltaDirect app for Apple iPad devices.

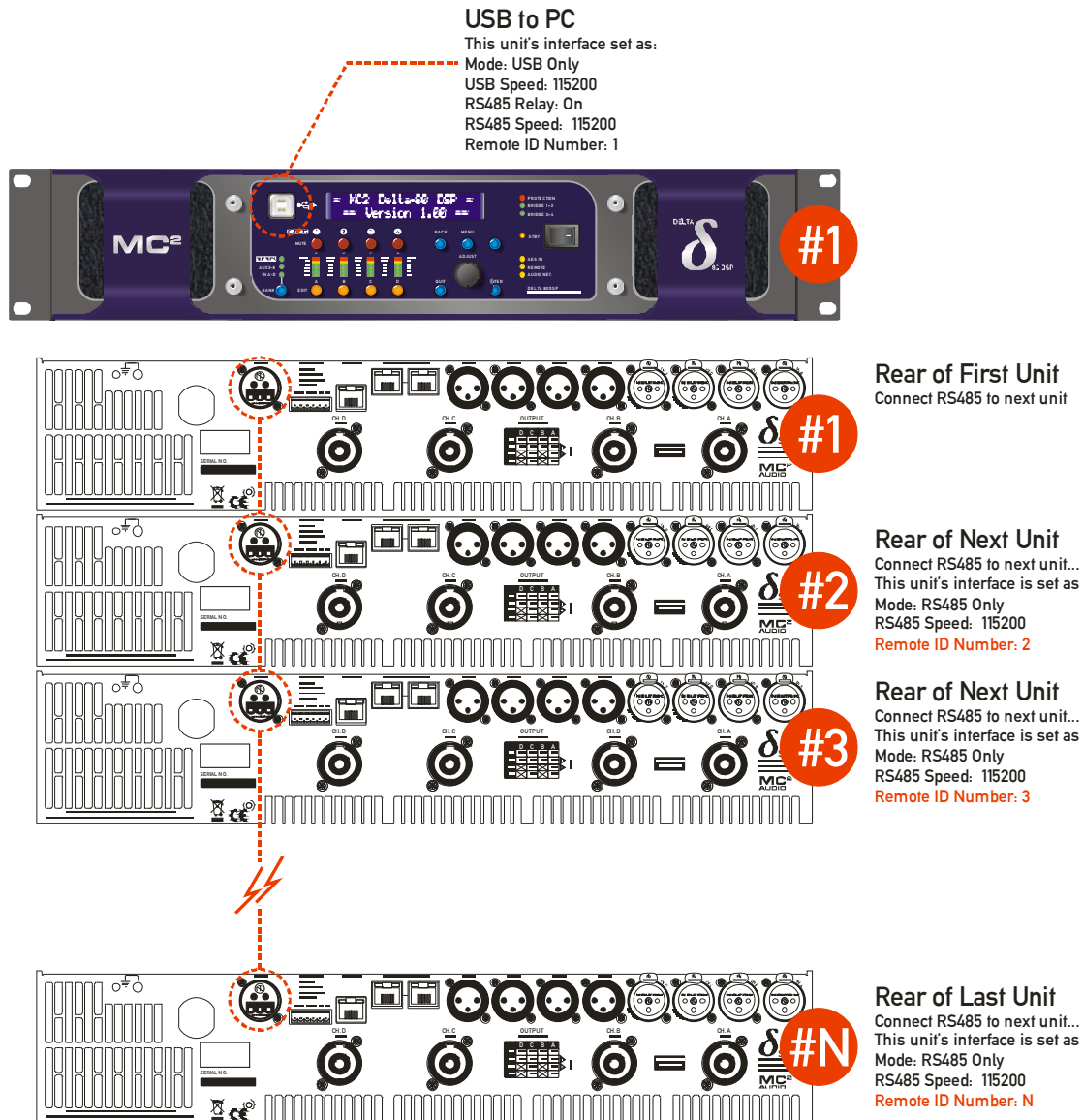
Main configuration is performed via AudioCore, either with a wired connection via Ethernet, USB or RS485. Connection to amplifiers is also possible wirelessly using the Ethernet connection if this is via a wireless router.

Tuning of a system can then be performed wirelessly (via a WiFi connection) using just the iPad, which allows full adjustment of all aspects of a network of amplifiers.

Choosing the Best Remote Control Method for your Application

Direct USB

The simplest method to connect to computer is with a simple USB cable via the front panel of a Delta/DPA amplifier. APA amplifiers can only be connected via an Ethernet connection. If you are working exclusively with Delta/DPA amplifiers then as long as the first device can be near the computer, this will allow all other amplifiers to be daisy-chained from the RS485 bus:



The only disadvantage is that this connection method cannot work with DeltaDirect – our iPad app, as there is no way to establish a wireless control connection. Remember that the total length of an RS485 bus is 1000m from the first device to the last – not 1000m per interconnect!

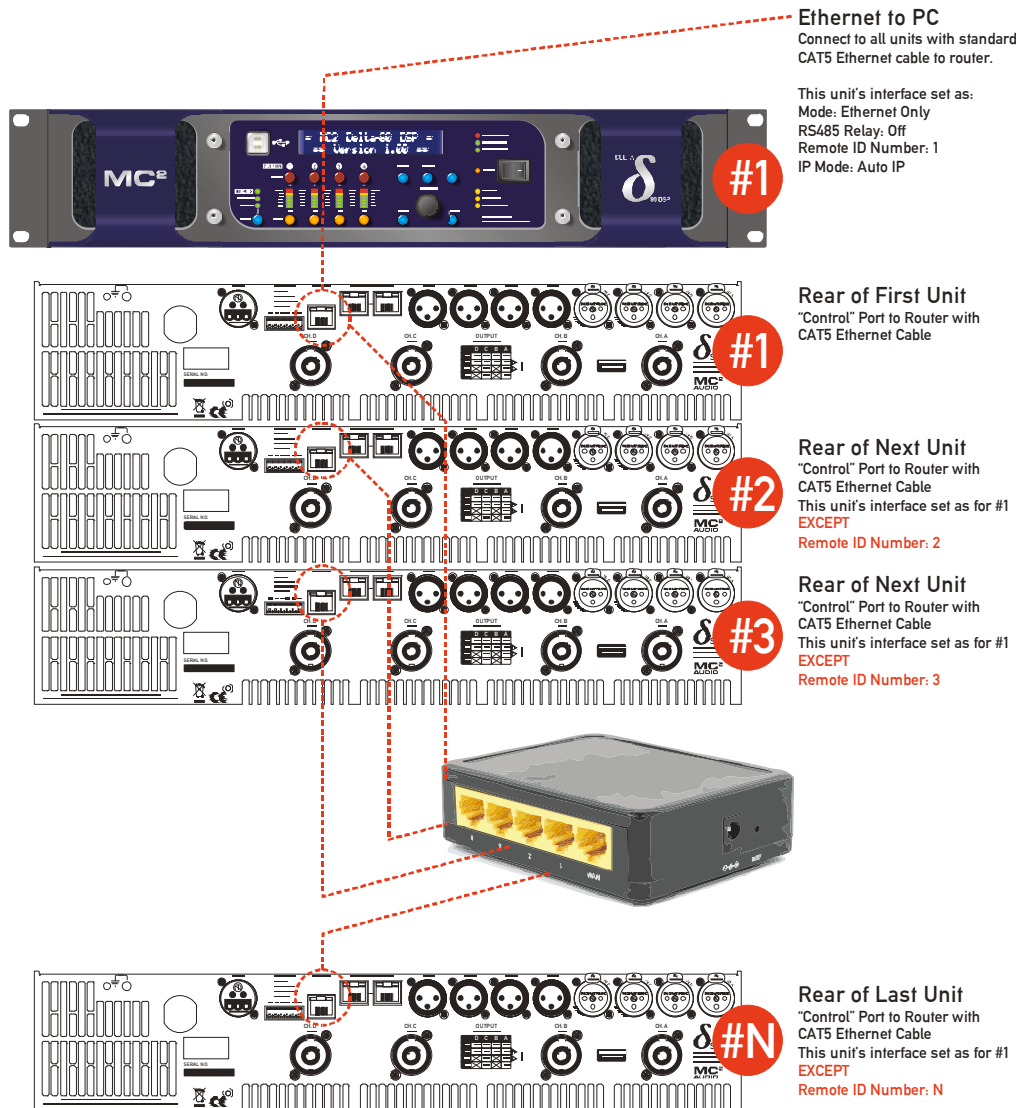
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Ethernet Only

Connecting using a standard Ethernet cable either direct to a PC, or via a LAN is the method most widely used as it is still low cost and uses standard cables and existing infrastructure. Connection using a switch will be required for multiple amplifiers unless RS485 relay mode is used, which will be covered in a subsequent section.

If your system includes APA amplifiers, the Ethernet connection is the only method that can be used.



Remember that the recommended max distance for a point to point Ethernet connection is 100m – beyond this a switch must be used to extend the distance. Make sure that there is only one DHCP server on a network if multiple switches or routers are being used (especially if a Wifi router is connected as well).

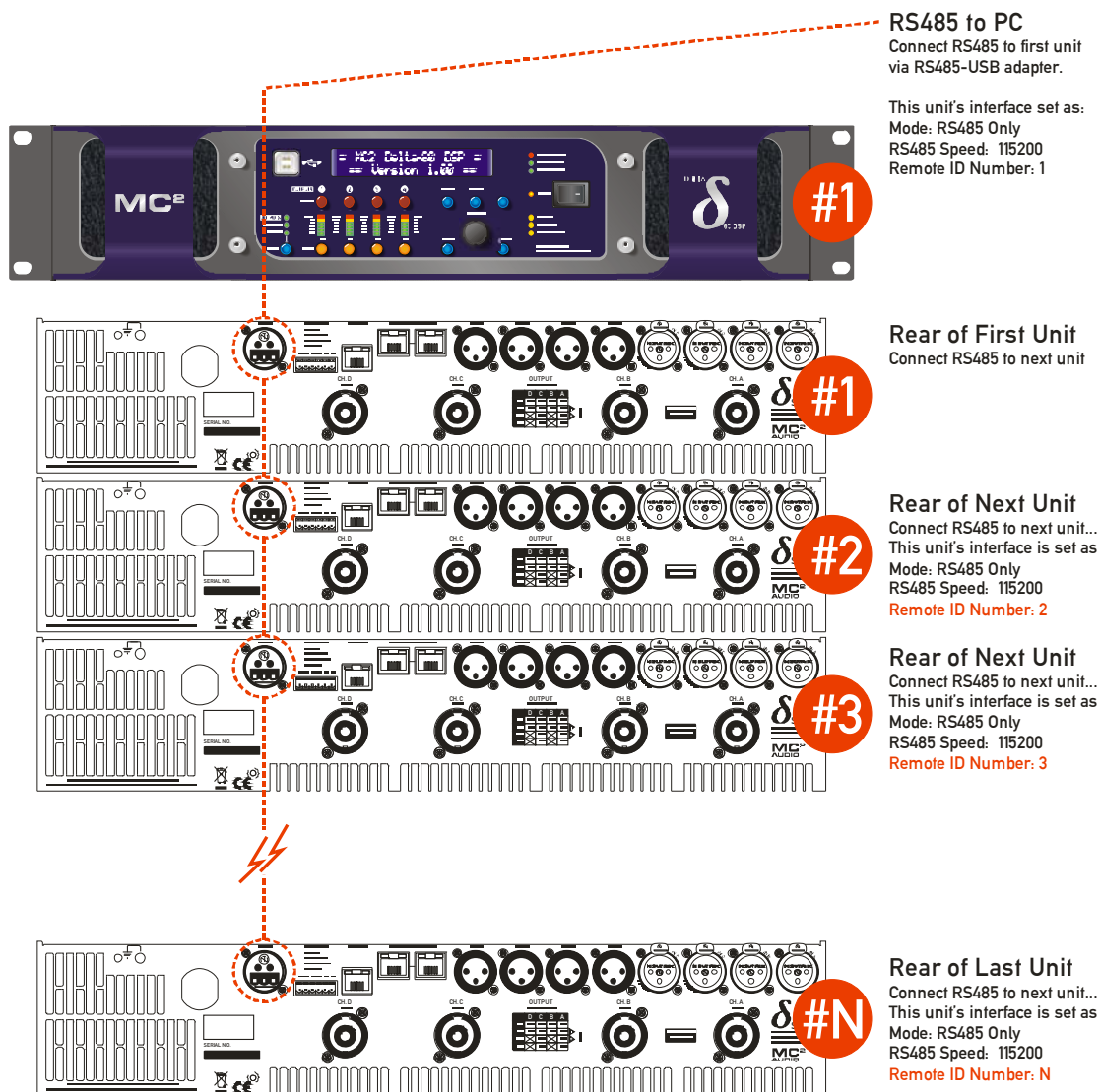
This method, if using a Wifi router, will also allow use of DeltaDirect – out iPad app, but be aware it cannot be online at the same time as AudioCore! AudioCore can also connect wirelessly and this is a seamless change from the wired connection as long as the Wifi network is setup on the PC.

RS485 Only

RS485 mode is useful in situations where there may be long distances required between connected units, and it is not possible or practical to use the Ethernet method of connection. RS485 can cover up to 1000m (greater distances if the baud rate is reduced), but remember this distance figure is the total for the bus, not the distance between devices.

It will require a USB to RS485 converter (this is an intelligent adapter, not just a cable adapter) – please ask us about this or read the interface guide on XTA's website here:

http://www.audiocore.co.uk/wp-content/uploads/2015/06/remote_interface_guide_15.pdf



Remember that APA amplifiers cannot connect via RS485 (despite having the RS485 socket on the rear panel – this is for test diagnostic purposes only)

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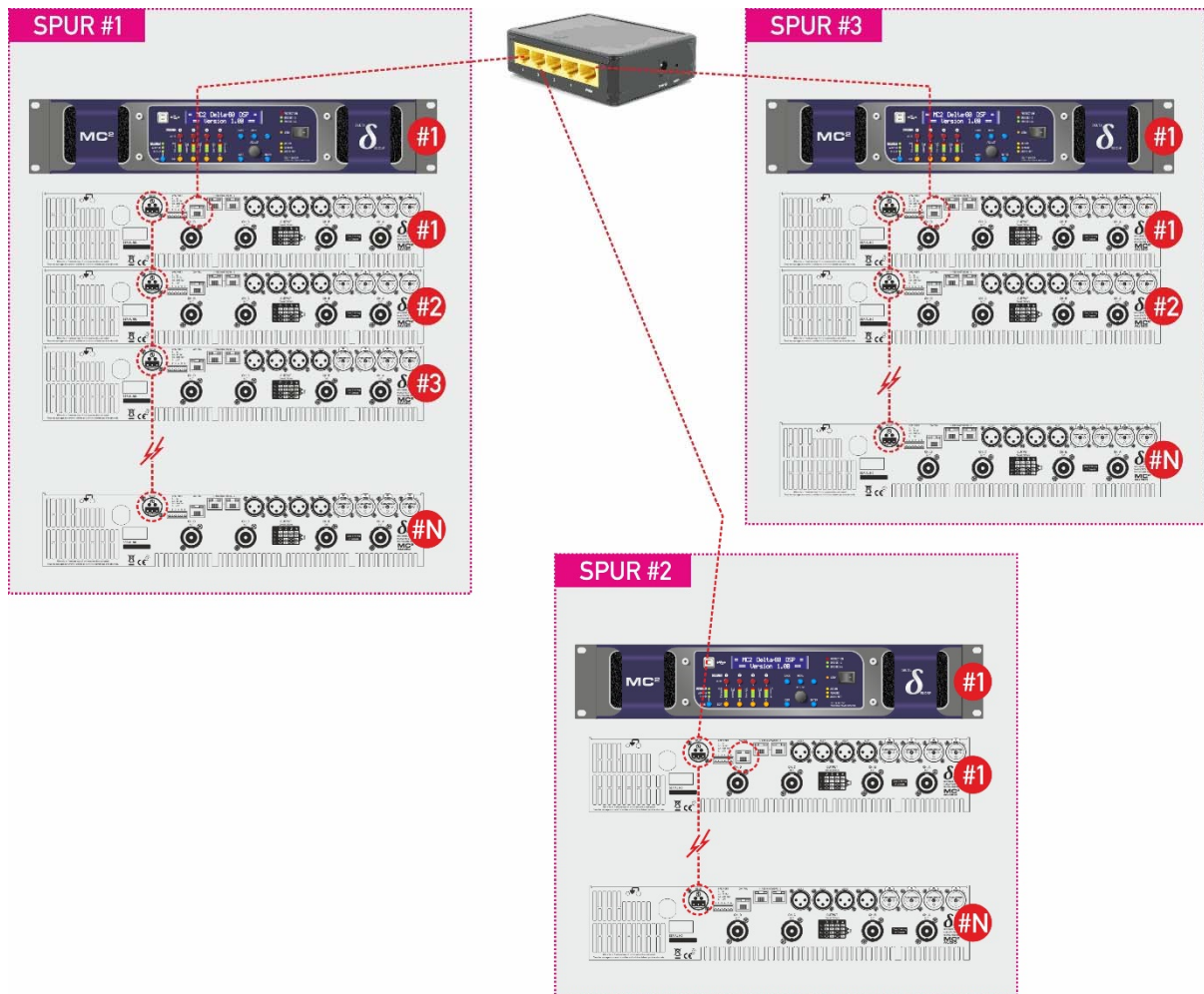
What About RS485 Relay Mode?

RS485 relay mode can be used in both USB and Ethernet systems – with USB systems it is seamless and all amplifiers will be discovered via the single RS485 chain from the rear of the “Master” unit.

In the case of Ethernet systems, one unit can assume the role of a “Master” as with a USB connection, with subsequent “downstream” units being connected via the RS485 bus:

It is also possible to have multiple “spurs” of Ethernet connected “Masters” with daisy-chained units on RS485 from each “Master” amplifier. This is only possible with Delta and DPA amplifiers – remember APA amplifiers must be individually connected to a switch/router via the Ethernet “Control” port (USB and RS485 remote control cannot be used with APA amplifiers).

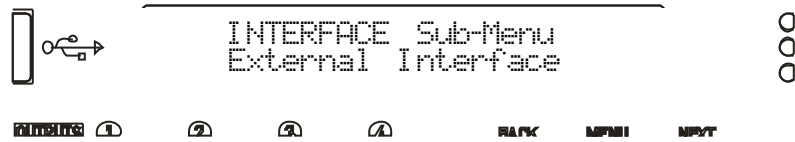
This would be a useful connection scenario when the number of Ethernet switch ports is limited, or a single wireless router is being directly used with only a few ports available.



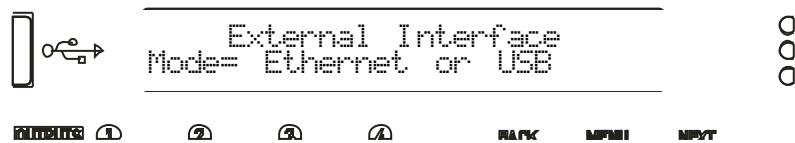
Note that the total number of IDs on the system must not exceed 32 amplifiers, and that ID numbers cannot be repeated, even on the individual spurs as in the example system above.

Configuration of the Remote Interface (Delta and DPA)

To configure the remote interface, from the home screen, press MENU, choose the INTERFACE Sub-Menu and press ENTER.



Use the encoder or BACK and NEXT keys to select External Interface and press ENTER.



Use the encoder or BACK and NEXT keys to choose the required interface and press ENTER. This will invoke a series of further options depending on the interface chosen – these are explained below:

Mode = OFF: Interface is disabled and no external comms are active. This is useful if you need to fully secure your amplifier as well as locking the front panel (for more information on security and locking see the operator's manual.)

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Mode = Ethernet Only: The Ethernet control port on the rear panel is active. Selecting this choice will then ask for the following further information to be confirmed:

RS485 Relay: Choose ON to relay all remote control data onto the RS485 network for connection to further devices (other Delta DSP amplifiers)

RS485 Speed: Only shown if RS485 Relay = ON: set RS485 baud rate (recommended to use 115200)

Remote ID Number: Set a device ID (still required even on Ethernet connections). This must be unique to the connected unit – setting the same ID on multiple units may cause comms problems for all devices.

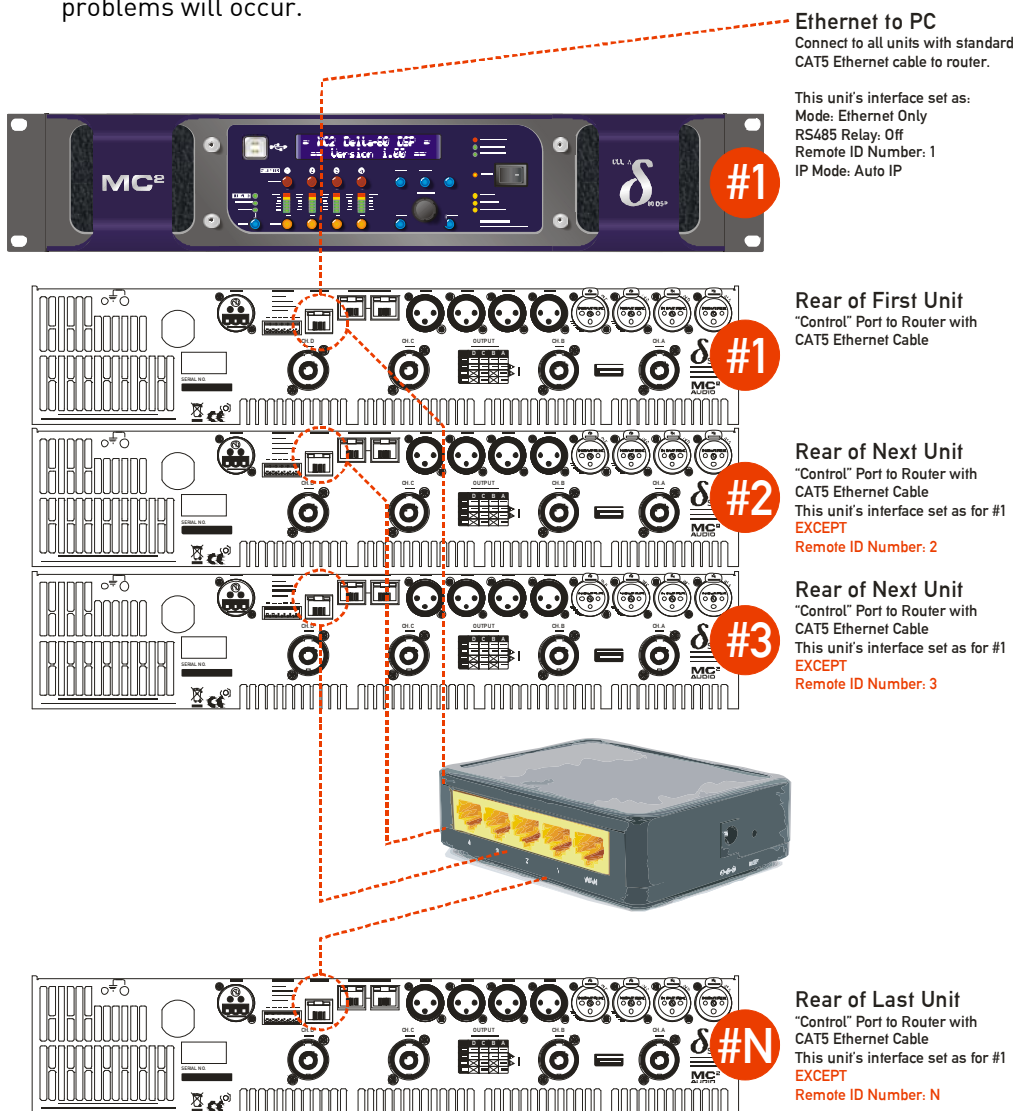
IP Mode: Choose either Static or Auto IP. Auto IP will generate an IP address based on unique hardware features such as MAC address. Choose Static if you need to select the IP address to lie within a specific range, for instance when working within a larger infrastructure.

Gateway: The gateway address is used for external access to the Internet and should be left at the default setting.

Subnet: The subnet mask is used to subdivide IP addresses into groups that allow further sub-groups addressing to be defined, so further extending the address range.

Leave at default 255.255.255.0 unless specifically required.

IP: The IP address specifies the amplifier's unique identifier on the Ethernet network. It is used in conjunction with the amplifier's Remote ID number to identify individual devices on the network. Make sure this is not set to the same value as any other devices or comms problems will occur.



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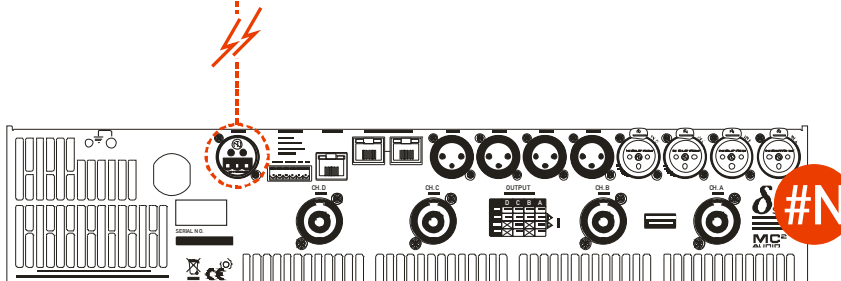
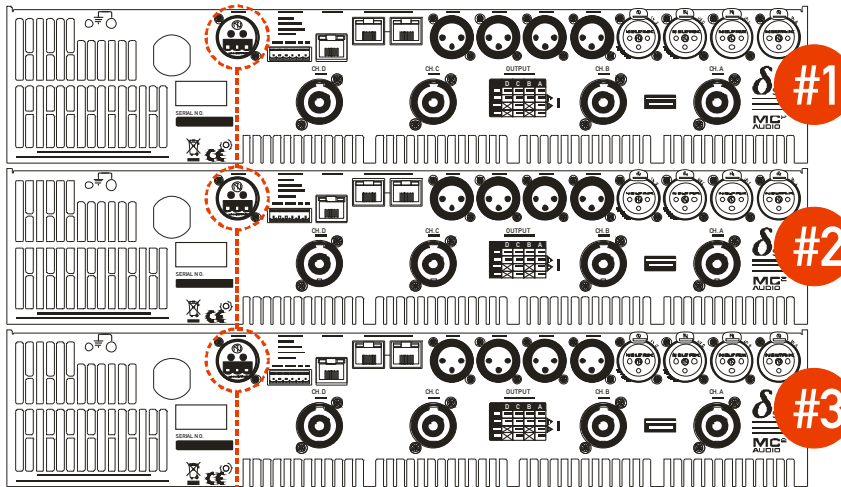
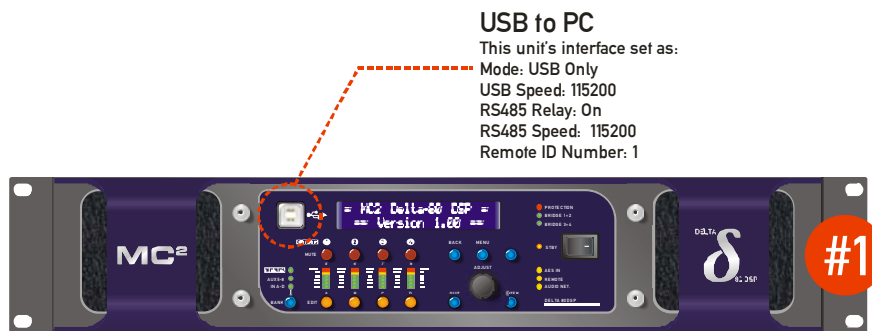
Mode = USB Only: The USB socket on the front panel is active. Selecting this choice will then ask for the following further information to be confirmed:

USB Speed: As the USB connection appears as a virtual COM port in remote software, it still has an associated serial speed. Leave at the default of 11500. This is not the actual USB serial data rate – it's the virtual COM port data rate!

RS485 Relay: Choose ON to relay all remote control data onto the RS485 network for connection to further devices (other Delta DSP amplifiers)

RS485 Speed: Only shown if RS485 Relay = ON: set RS485 baud rate (recommended to use 115200)

Remote ID Number: Set a device ID (still required even on Ethernet connections). This must be unique to the connected unit – setting the same ID on multiple units may cause comms problems for all devices.



Mode = Ethernet Or USB: The Ethernet control port on the rear panel is active, so long as the amplifier is not connected via USB, whereupon it automatically takes priority. Selecting this choice will then ask for the following further information to be confirmed:

RS485 Relay: Choose ON to relay all remote control data onto the RS485 network for connection to further devices (other Delta DSP amplifiers)

USB Speed: As the USB connection appears as a virtual comm port in remote software, it still has an associated serial speed. Leave at the default of 115200. This is not the actual USB serial data rate – it's the virtual COM port data rate!

RS485 Speed: Only shown if RS485 Relay = ON: set RS485 baud rate (recommended to use 115200)

Remote ID Number: Set a device ID (still required even on Ethernet connections). This must be unique to the connected unit – setting the same ID on multiple units may cause comms problems for all devices.

IP Mode: Choose either Static or Auto IP. Auto IP will generate an IP address based on unique hardware features such as MAC address. Choose Static if you need to select the IP address to lie within a specific range, for instance when working within a larger infrastructure.

GtWay: The gateway address is used for external access to the Internet and should be left at the default setting.

Subnt: The subnet mask is used to subdivide IP addresses into groups that allow further sub-groups addressing to be defined, so further extending the address range. Leave at default 255.255.255.0 unless specifically required.

IP: The IP address specifies the amplifier's unique identifier on the Ethernet network. It is used in conjunction with the amplifier's Remote ID number to identify individual devices on the network. Make sure this is not set to the same value as any other devices or comms problems will occur.

Remember that this mode is purely an automatic priority switching version of an Ethernet or USB connection – it is not possible to interconnect amplifiers via the Ethernet cables either directly or via a router – use the RS485 bus for device interconnection.

All three connection methods will relay data either explicitly (RS485 using the hardware bus connection) or electronically (USB or Ethernet through the processor) if required.

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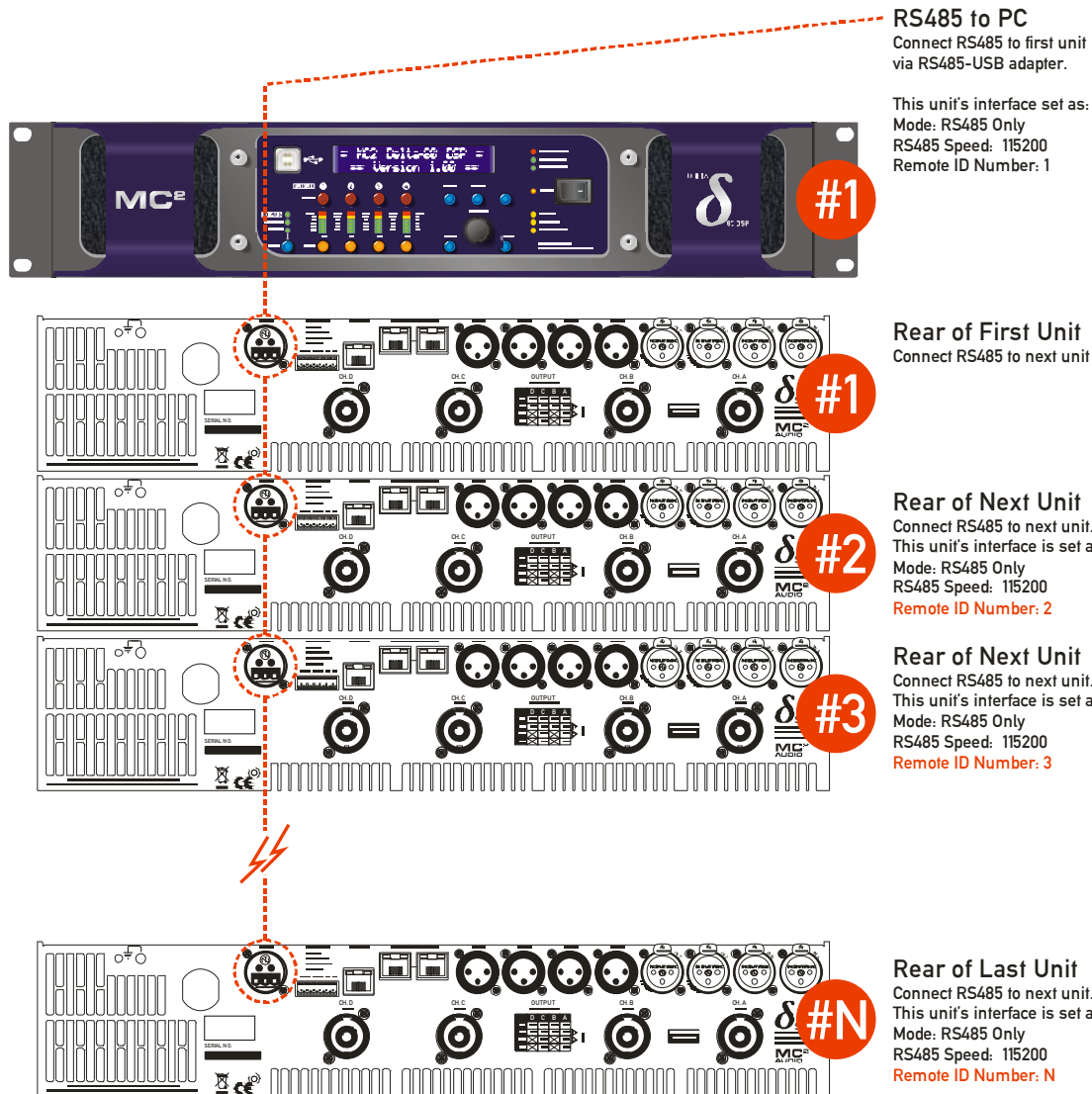
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Mode = RS485 Only: The RS485 port on the rear panel is active. Selecting this choice will then ask for the following further information to be confirmed:

RS485 Speed: Set RS485 baud rate (recommended to use 115200 unless working with older DP224 and DP226 processors in which case use 38400)

Remote ID Number: Set a device ID (still required even on Ethernet connections).

This must be unique to the connected unit – setting the same ID on multiple units may cause comms problems for all devices.



Hardware Set-up – APA Amplifiers

APA amplifiers *must* be connected via an Ethernet connection to the control port on the rear panel. They will not relay or respond to RS485 data. The USB port on the front panel is only used for firmware updates and backup/loading of presets.

Overview

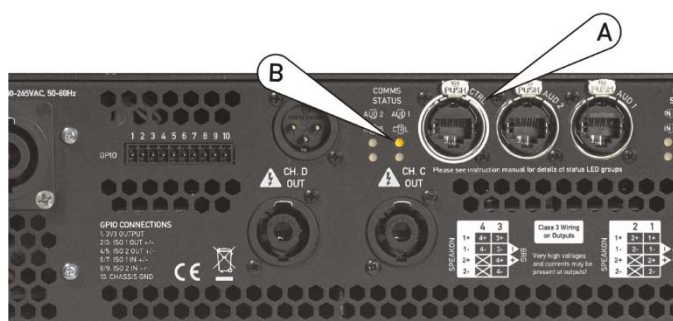
Full remote control of all your APA's DSP functionality and monitoring of all aspects of its performance is achieved by connecting it to a standard Ethernet network.

There are three RJ45 ports on the rear panel of your APA – two are connected to the (optional) network audio interface card and one is designated as the "control" port "CTRL" which is independent of the network audio interface and is used as your remote control connection. By arranging the connections like this, your amplifier is future-proofed against changes in network audio protocols and topologies, should these change in years to come.

Ideally, your computer network infrastructure will include a DHCP server. The Dynamic Host Configuration Protocol server is responsible for assigning, amongst other things, IP addresses to connected clients. This server functionality may be implemented in your network router, or be running as an application on your network's server, if one exists. If you are unsure as to whether your network has a DHCP server, you should contact the administrator to find out. Many wireless routers and switches will have this built-in.

It is not essential for connection to a network of APA units, but it makes management of the network much simpler and more secure.

Configuration of the Remote Interface (APA)



Plug a standard Ethernet cable into the "CTRL" port on the rear of your APA (A).

Connect the other end of this cable to your router/switch.

If a valid connection is established, the CTRL status LED on the rear panel will illuminate in yellow (B), and the front panel CTRL LED below the display will illuminate in green (C).



Assuming the home screen is visible (briefly press the POWER/Home button if not), after a few seconds the IP address shown at the bottom of the screen will change from 0.0.0.0 to a valid address, normally of the form 192.168.nnn.nnn.

This Amplifier is:	
SUBS FAR LEFT STAGE	
Preset running is: 21" Infrass + 18" LMX	
Status: OK	Security level: 0 (Full Access)
IP:192.168.45.14	Unit ID: 01 35 45 F4 5B

The unit should now be visible to the remote control software, as long as your computer is connected to the same network.

The amplifier firmware must be updated to an AudioCore compatible version – please contact us for more information as to how to update your APA as required.

It will also be necessary to set an AudioCore unit ID number in the firmware. This is available through the Unit Sub-Menu:

Unit Sub Menu	
> Unit Info (IP, Firmware Versions etc.)	
> AudioCore Unit ID (Comms ID for AudioCore)	
> IP Address Set-up (Auto or fixed IP selection)	
> Identify Unit	...

Set a number between 1 and 32 that doesn't clash with another ID on the network (any other amplifier, not just APA).

AudioCore Unit ID	
ID:	1

Exit by pressing the MENU button to jump back a level or the Home/Power button to get back to the default screen.

Adhoc Connections (no DHCP Server)

It is possible to connect directly to a single APA amplifier without routing through a network. This connection also uses the "CTRL" port on the rear panel, but does not require a DHCP Server to be preset to assign an IP address. A valid network connection must be established first for this process to begin – the CTRL LED must illuminate. Plug an Ethernet cable in as for the network connection, but plug the other end of the cable directly into your computer's Ethernet port. The amplifier will assign its own internally generated IP address after about 30 seconds, if no valid DHCP Server has replied.

This is indicated by the IP address that is shown changing from 0.0.0.0 to something of the form 169.254.99.4 – the leftmost pair of octets not being the normal "192.168" form. Note that these IP addresses are also dependent on how the network has been configured by your network administrator – these addresses are only given as examples.

Manual (fixed) IP Address Selection

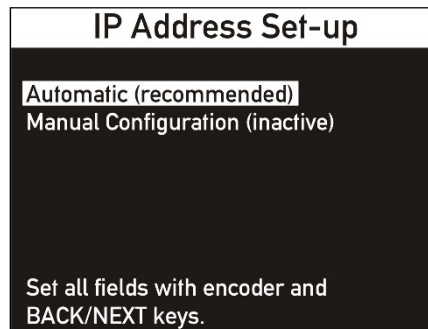
There may be circumstances when auto generated IP addresses will not work within your current network infrastructure, such as in large systems where IP address ranges have been set by the network administrator. It is possible to manually set the IP address used by the unit.

Please note that the default setting is for IP addresses to be set automatically, and XTA recommend that this setting is used unless there is a valid reason not to!

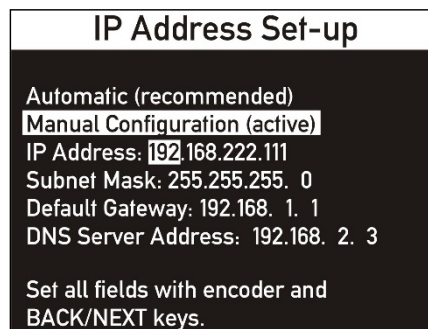
To set the IP address manually, press MENU and navigate to the IP Address Set-up option in the UNIT SUB MENU and press ENTER.

Unit Sub Menu	
> Unit Info (IP, Firmware Versions etc.)	
> IP Address Set-up (Auto or fixed IP selection)	
> Identify Unit (Highlight this amplifier)	
> Mains RMS Current Limit	...

The default selection is for automatic IP address selection.



To change this to manual, press NEXT to display all the manual set-up parameters.



Changes are saved automatically – exit by either pressing MENU to drop back through the levels or power/home to get back to the home screen. Note that the manual IP address will not be shown on the home screen until a valid network connection is established (CTRL LED is illuminated).

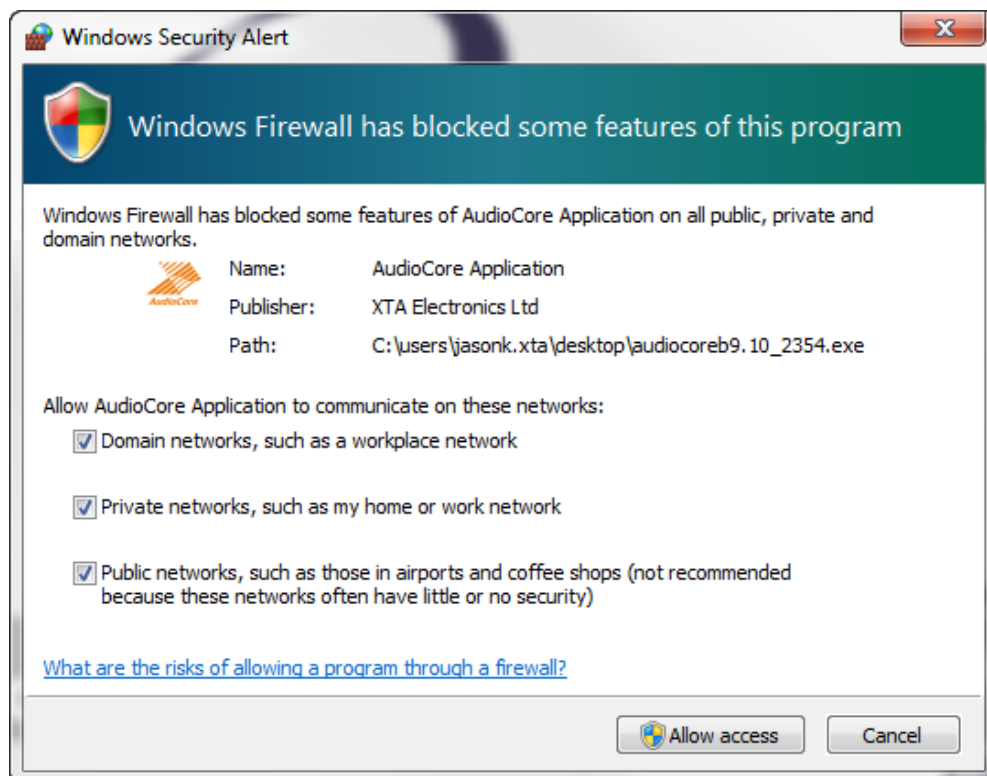
Refer to your network administrator for the required settings of the other fields shown. Remember – if you don't need to set a manual IP address, return the unit to automatic mode by pressing the BACK button on this screen until "Automatic (recommended)" is highlighted again.

Starting the Software and Getting Online

If you're an AudioCore user you'll find the Amped Edition works a little differently to what you will be used to. The quickest way to get online is to let the software discover all devices and upload the current settings and/or memories from all amplifiers that it finds.

IMPORTANT – ALLOWING GRANTING NETWORK ACCESS TO AUDIOCORE IS ESSENTIAL

The very first time the software is used, it will default to checking for units on an Ethernet connection only. This procedure happens automatically whilst the splash screen is displayed. You will see a security warning from Windows asking if it's OK to allow this application to access your network:



This will only appear once and you must give AudioCore access to all networks, to cover use over wired and wireless networks. Tick all three boxes and then press "Allow Access". If you accidentally miss this and cancel instead then AudioCore will NOT connect via Ethernet or Wifi connections.

Choosing Connection Method

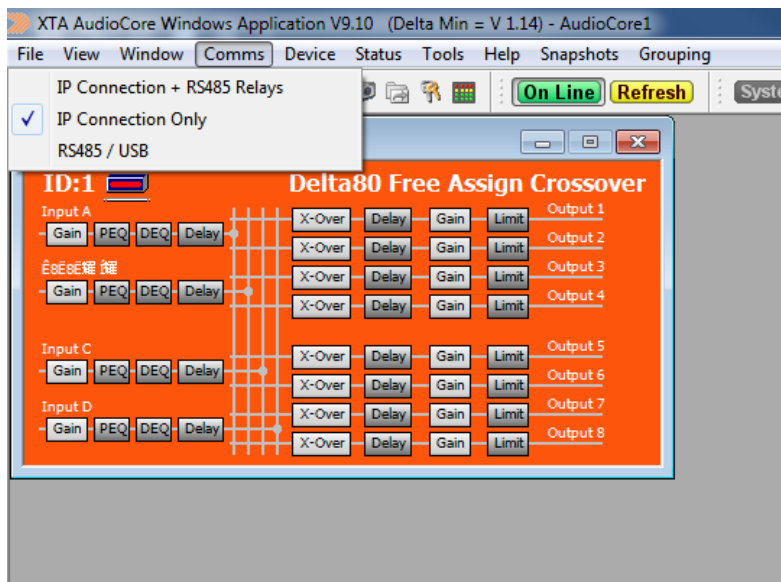
As with the amplifier hardware, the method chose to connect must be selected in AudioCore. By default, this is "IP Connection (Ethernet or Wifi) + RS485 Relay", but this is easily changed in the Comms Menu prior to going online.

If you are not using RS485 Relay Mode, and only Ethernet connections, then choose "IP Connection Only" – this makes the scanning process quicker when going online and when starting the software (scanning is undertaken automatically during the splash screen display).

Using a USB connection or RS485 relay mode

DPA and Delta amplifiers can be controlled via their USB connections on the front panel. Control can then be daisy-chained via RS485 connections on the rear panels.

Using a USB connection, or even a direct RS485 connection requires AudioCore to scan the system differently and so this connection mode must be selected:



Choose RS485/USB from the Comms menu when using a direct USB connection or a USB-RS485 adapter.

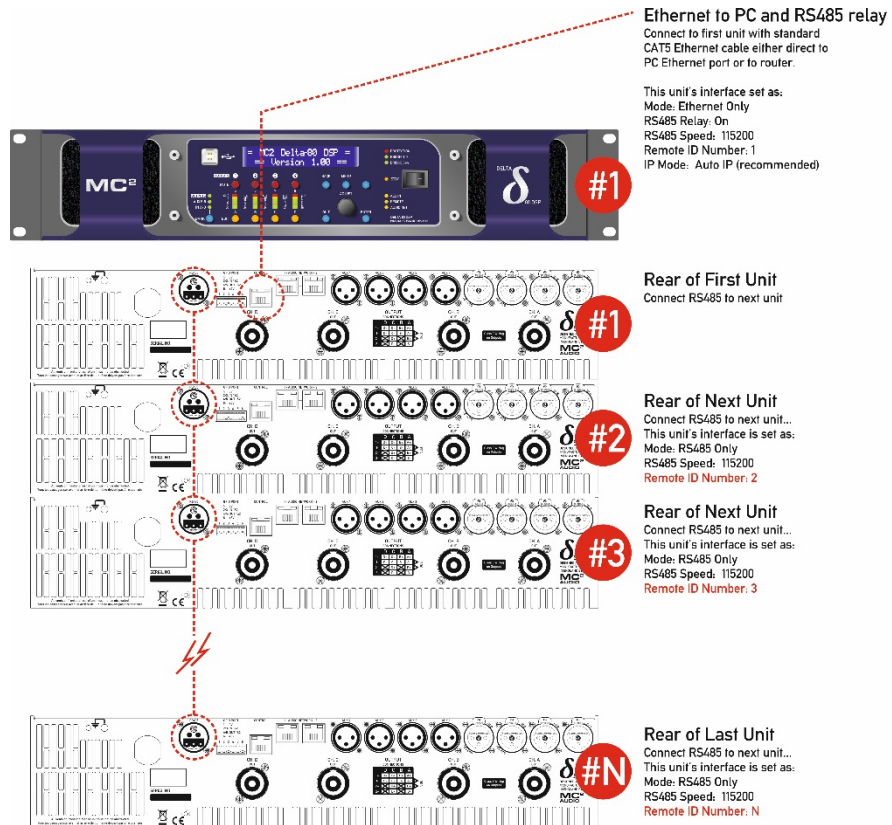
Do not leave a USB connection plugged into an amplifier at the same time as an Ethernet connection - this will cause comms conflicts and unpredictable results.

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RS485 relay mode can be used in both USB and Ethernet systems – with USB systems it is seamless and all amplifiers will be discovered via the single RS485 chain from the rear of the “Master” unit. In the case of Ethernet systems, one unit can assume the role of a “Master” as with a USB connection, with subsequent “downstream” units being connected via the RS485 bus:

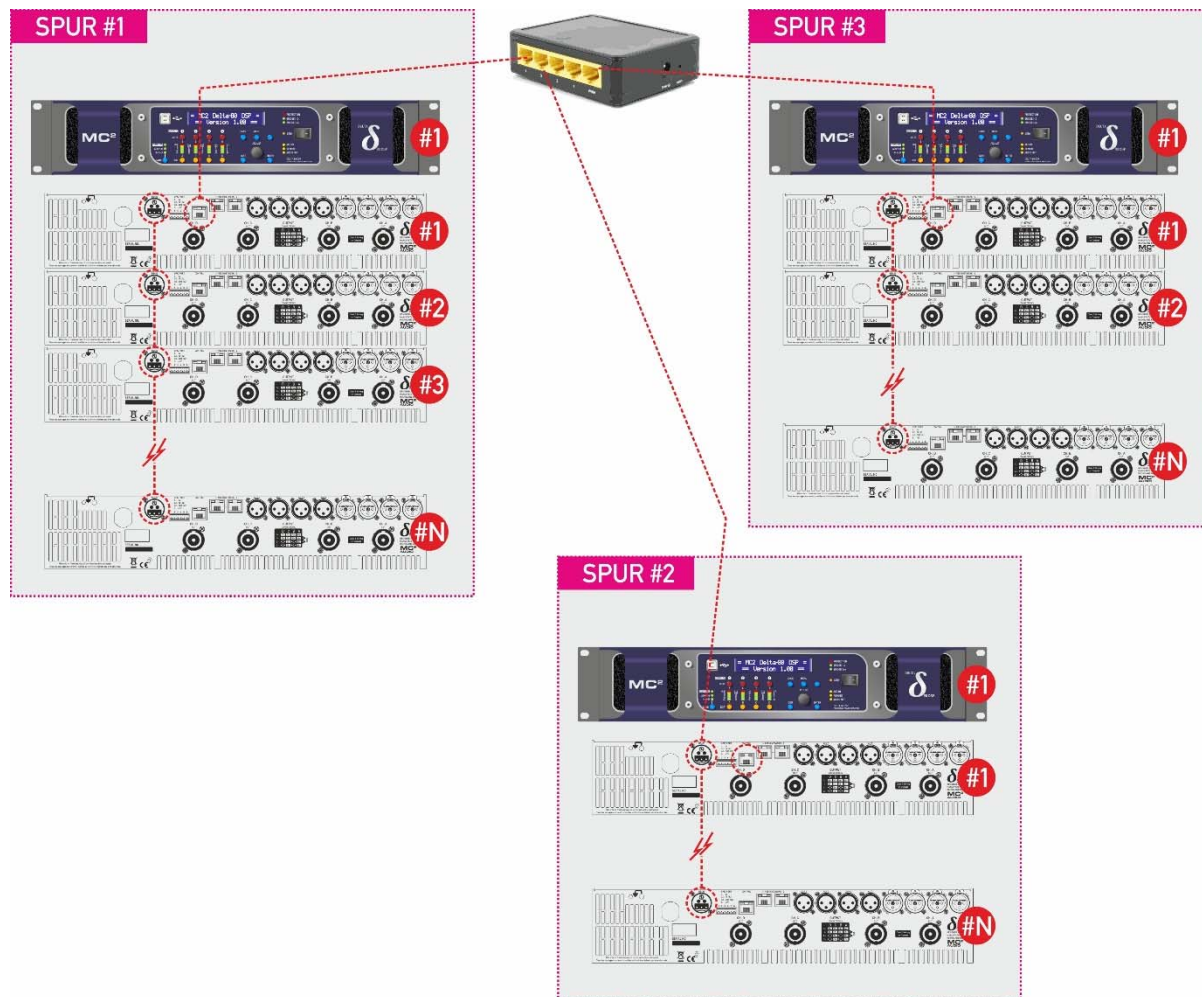
This would be a useful connection scenario when the number of Ethernet switch ports is limited, or a single wireless router is being directly used with only a few ports available.



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It is also possible to have multiple "spurs" of Ethernet connected "Masters" with daisy-chained units on RS485 from each "Master" amplifier. This is only possible with Delta and DPA amplifiers – remember APA amplifiers must be individually connected to a switch/router via the Ethernet "Control" port (USB and RS485 remote control is not an option on APA amplifiers).

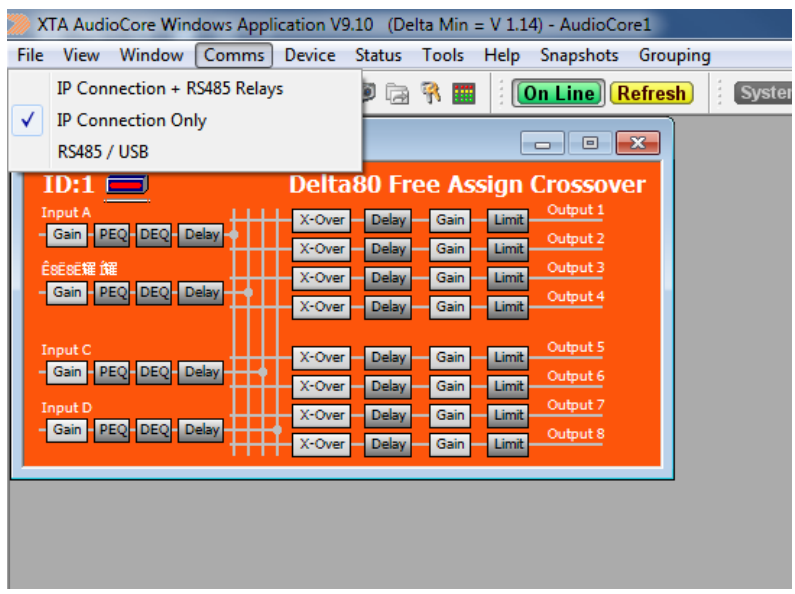


Note that the total number of IDs on the system must not exceed 32 amplifiers, and that ID numbers cannot be repeated, even on the individual spurs as in the example system above.

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When using any mode of RS485 relay, AudioCore again needs to be configured accordingly:



Choose "IP Connection + RS485 Relays" from the Comms menu to ensure all "Spurs" are checked for downstream amplifiers.

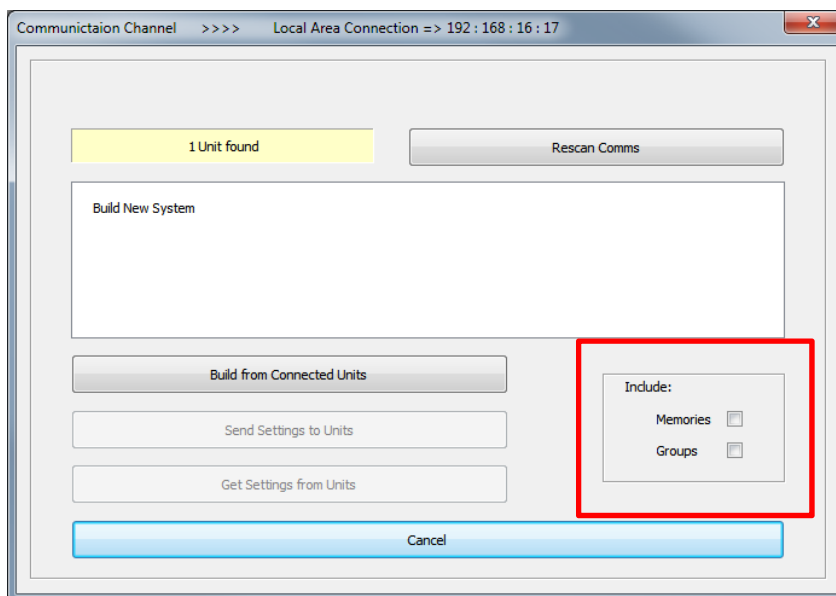
If using only directly connected Ethernet amplifiers, choose "IP Connection Only" to increase the speed of device discovery at start-up.

Starting from a blank workspace...

The software opens with a blank workspace and no units are present:



Pressing the Online button will display the Comms Control window, which shows the current connection type in the title bar and a variety of status and options:



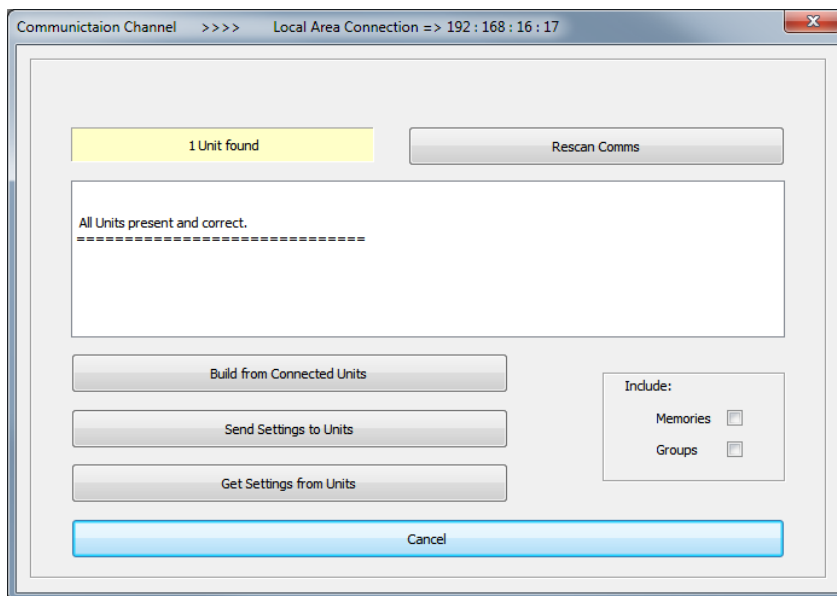
As there are no pre-existing units in the workspace, the only option is to “Build System from Connected Units” – the yellow pane shows that one has been discovered, and the status window shows that the Build New System is available.

Note the two tick boxes to include unit memories and group data in the upload which will start when the “Build System From Connected Units” button is pressed.

If you only need the current unit settings (what you are listening to) then leave the “Memories” tick box unchecked. If you have not used grouping before or are unsure, leave “Groups” unchecked. After pressing the “Build...” button, the unit will appear in the workspace. Control of the unit from this point is very similar to the control of a 4 Series processor, with some changes according to the amplifier model and type. These differences are detailed later in this guide, but we will continue with the other options on the Comms Control window.

From a pre-existing workspace...

You may have designed a system off-line, or have reloaded an existing system that has been modified off-line, and wish to connect to this system and send the changes to the amplifier(s). The same workflow applies – press the On Line button to connect:



The difference now is that AudioCore compares the amplifier line-up (so models and types against ID numbers) and reports back the difference between the off-line workspace and the system that has just been discovered on-line.

In this example, the two match, so “All units present and correct” is shown.

There are now more options available as there is data to send from the off-line workspace if required, as well as the option to overwrite the off-line data with the settings in the discovered system.

“Build System from Connected Units” will clear the off-line system, and build a new one (including any other previously unincluded amplifiers). This will add all connected amplifiers to the workspace and sync setting from them.

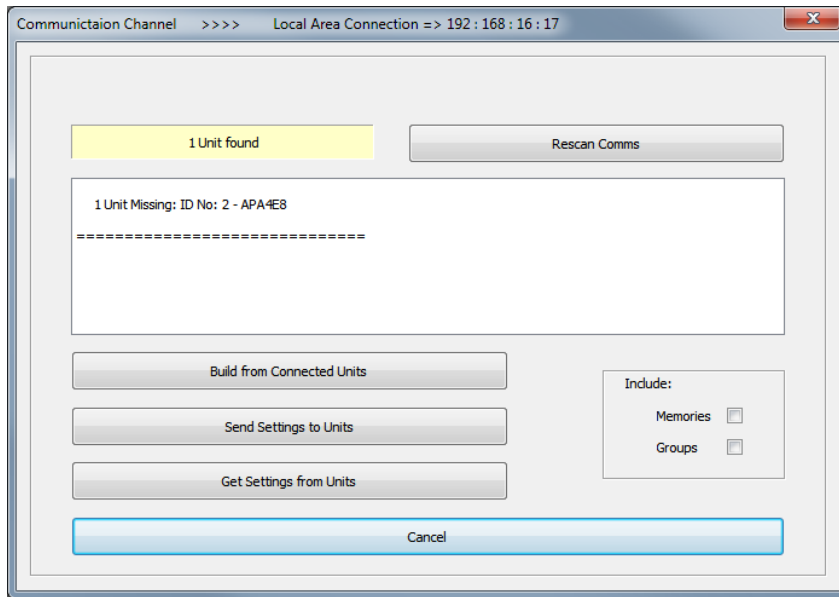
“Send Settings to Units” will send the offline workspace settings to the connected amplifiers. This can be used even if other amps are discovered and only those that exist in the off-line workspace will receive data.

“Get Settings from Units” will receive the settings from the connected amplifiers to update the workspace settings, but only for the amps that currently exist in the workspace. If additional amplifiers are on the network they will not be added to the workspace.

In the circumstance where the off-line system workspace doesn't match the discovered on-line system, the Comms Control window will detail the mismatch:

Delta Series, DPA Series, APA Series

AudioCore Amped Edition: What's new...



In this case, the off-line system contained an APA on ID2 that wasn't found when trying to sync the system.

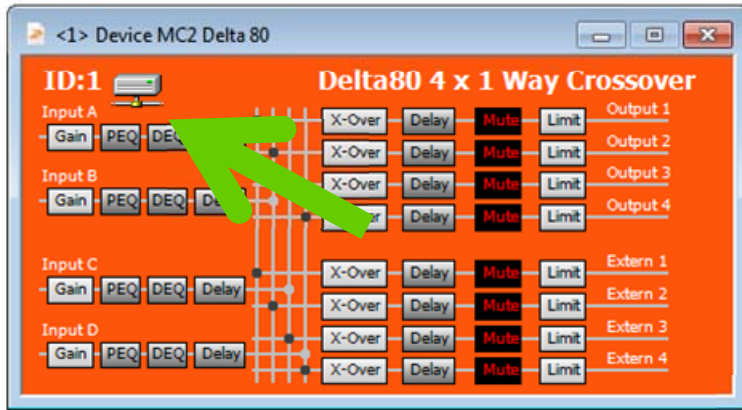
Delta Series, DPA Series, APA Series

AudioCore Amped Edition: What's new...

New Device Properties

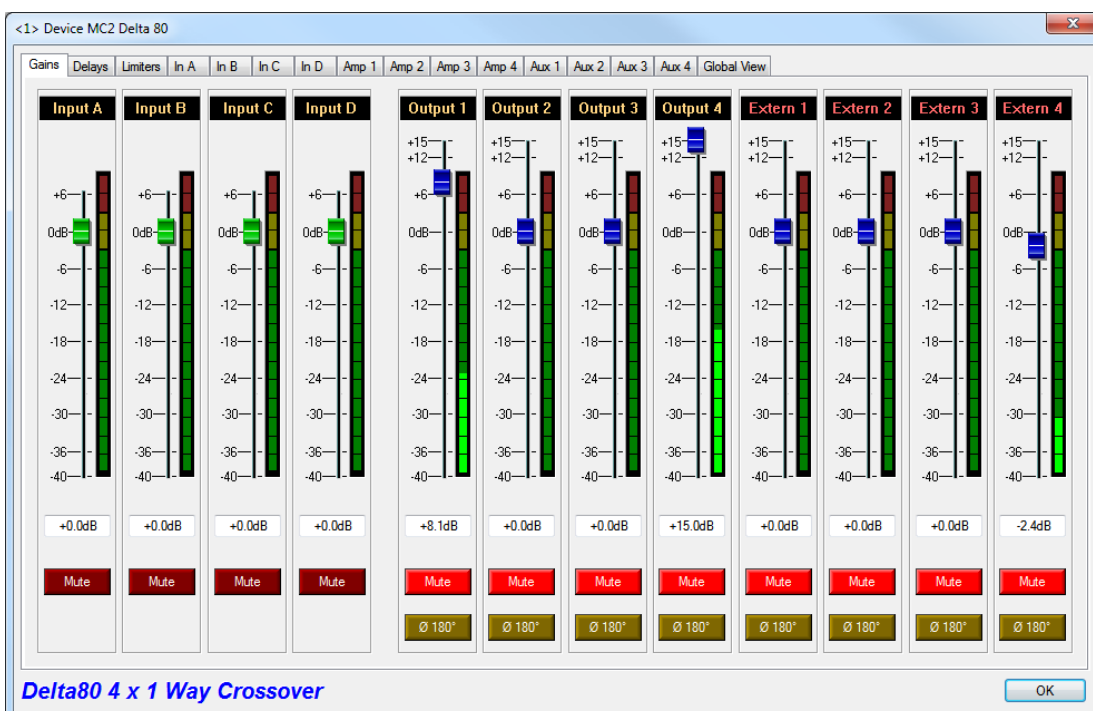
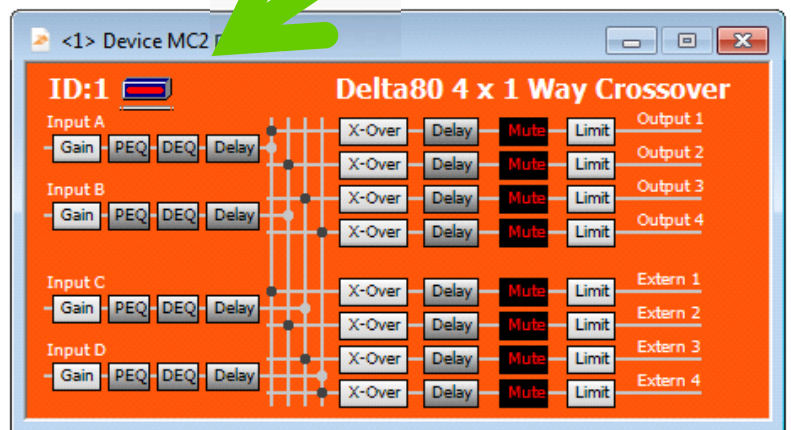
DPA and Delta amplifiers are identical in their DSP feature set and so can be considered as operating in the same way. APA amplifiers have a slightly different DSP topology and so will be dealt with separately.

Delta and DPA Amplifiers



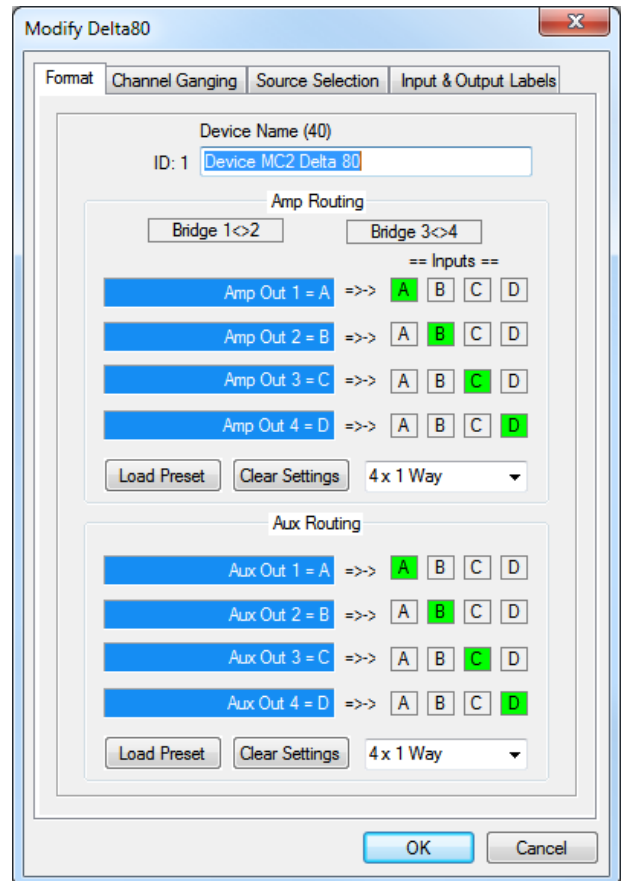
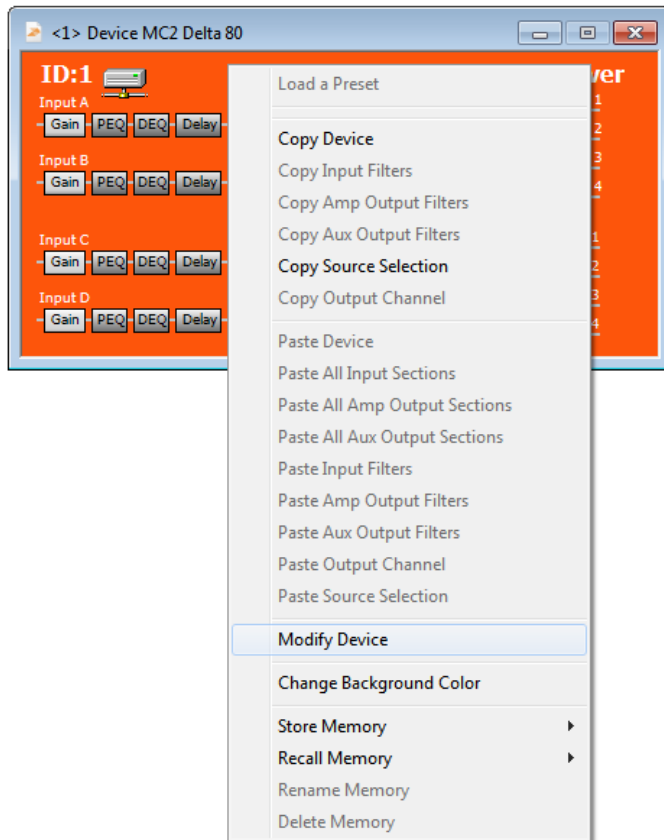
The signal processing layout is presented as four inputs on the left and two sets of four outputs to the right, the power amplifier outputs and the auxiliary (Extern) outputs.

Note the new addition of the online status icon beside the ID number top left. This will show a red bar if the amplifier loses connection with the network:



Opening up a device for editing by clicking on the required processing block will show the familiar AudioCore editing tabbed window.

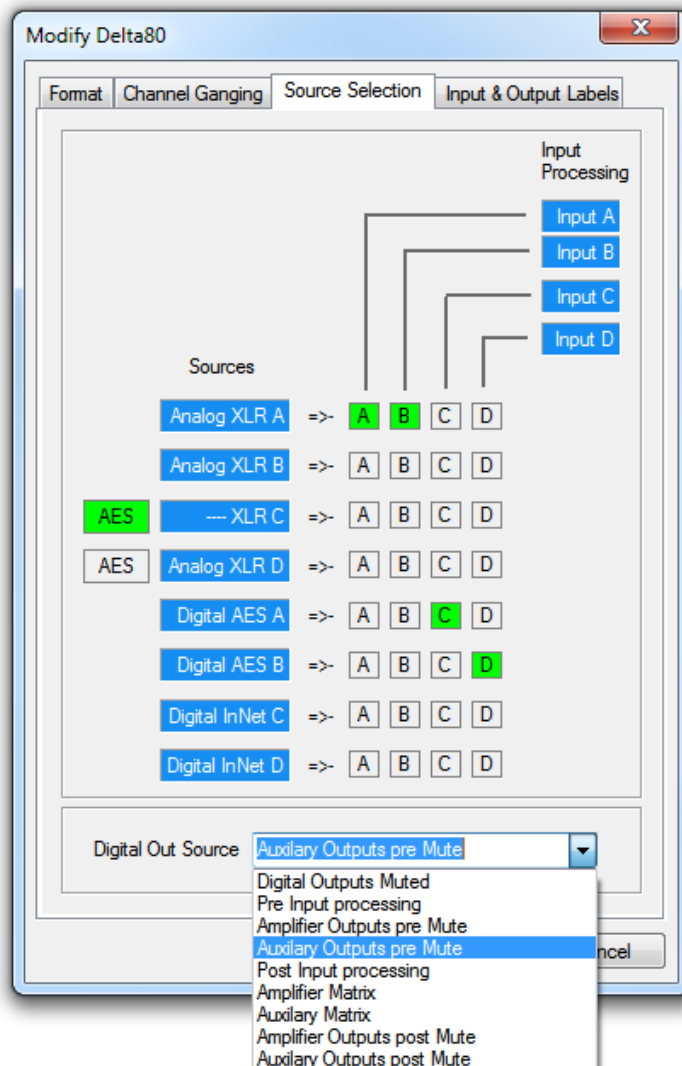
Modification of the DPA or Delta's amplifier specific features is accessed through a right click on the device window and choosing Modify Device, or from the top menu bar – Device > Modify



The amplifier routing from the input processing to output processing is defined on the first tab, along with setting the power amp outputs' bridge modes pairs switches. Note the outputs are still "split" into power amp outputs and aux outputs and are treated like this for the purposes of copy and paste procedures and memory handling – in a bank of four.

Channel ganging (again across a bank of four, not the whole amplifier) is on the second tab, and the fourth tab is where input and output labels can be defined.

The third tab is specific to Delta and DPA amplifiers and relates to the selection of signal sources to drive the input processing:



Each processing input channel can select from any analogue source, but be aware that there are several illegal combinations due to hardware configurations.

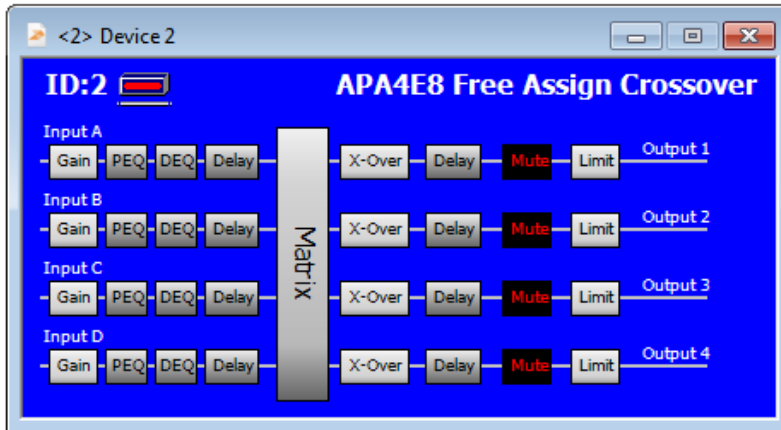
- 1) If AES is selected, the corresponding pair of analogue input becomes unavailable (as it shares the hardware socket) - for example AES is selected on input XLR C, so analogue inputs C is now unavailable.
- 2) Only four digital sources are available as choices in total – selecting an AES source will replace a pair of digital network sources - for example Network A&B are no longer available if AES A&B is selected.
- 3) Only one source can be selected for each input – this is not a mixing matrix, it is a switching matrix.

The digital (network) output source pick-off point is also selected from the drop-down list on this tab – remember this is a bank of four channels, so choices are for ALL Auxes or ALL Power Amp outputs.

APA Amplifiers

APA operates a little differently to the Delta and DPA amplifiers, in as much as there are no aux outputs, and independent network outputs can be freely mixed output by output via their own matrix.

The initial device window looks similar (with only 4 channels of output processing):



Right clicking on the device window or choosing Device > Modify from the menus will display the properties for the amplifier, and the first tab shown is the format tab.

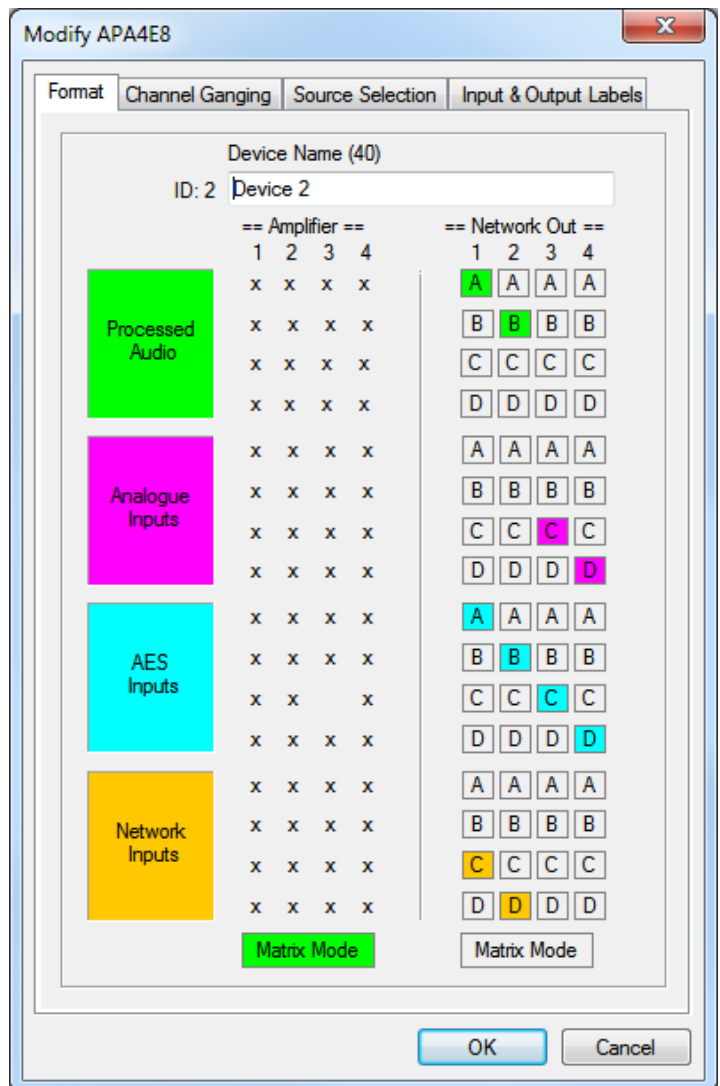
The amplifier and network outputs have completely independent choices for format – this tab is an overview of the matrix tab shown as part of the normal editing window.

If the matrix mode is set to OFF (as with the network output side in this example) sends to the output can be added by clicking on the channel crosspoint in the matrix.

Any combination of sends can feed any output, so for example, network output 1 can be fed from a combination of processed audio input (wherever it's sourced from) and AES input A.

Up to four sends can be switched in like this. Remember the same restrictions apply when using AES due to physical sockets on the amplifier – so using AES A or B means analogue inputs A&B are no longer available, and similarly with AES C or D will disable analogue C and D.

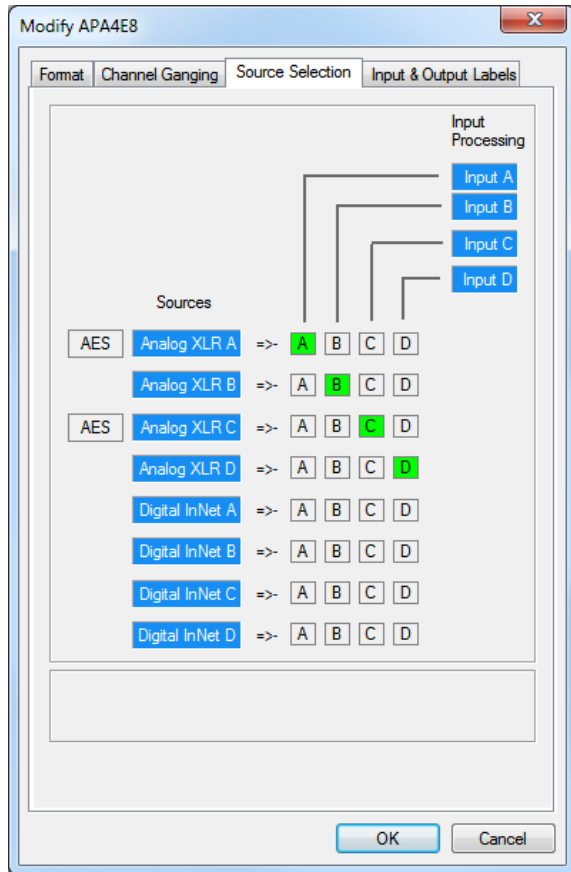
The matrix will not restrict these selections in software so remember how the hardware is configured!



Enabling Matrix Mode allows fully variable mixing of all possible sends – this is accessed via the matrix tab of the main amplifier editing window.

Source selection is the same as for Delta and DPA amplifiers, except that the AES selections affect different physical sockets:

APA Source Selection

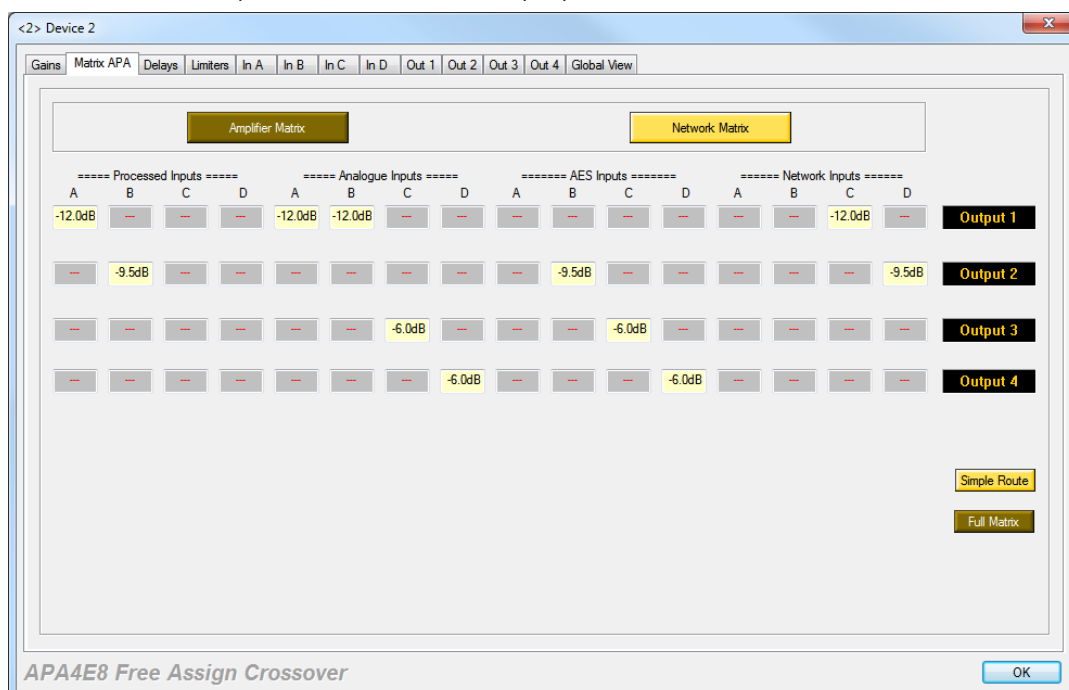


This follows similar rules as for DPA and Delta:

- 1) If AES is selected, the corresponding pair of analogue inputs become unavailable - for example AES is selected on input XLR C, so analogue inputs C&D are now unavailable.
- 2) Only one source can be selected for each input – this is not a mixing matrix, it is a switching matrix.

The restriction of only four digital sources being available at any one time is lifted and all possible sources can be selected (that is 4 x AES and 4 x Network Audio).

The device edit tabbed window has one additional control tab to configure the amplifier and network matrices in more detail than is permitted on the device properties window above:

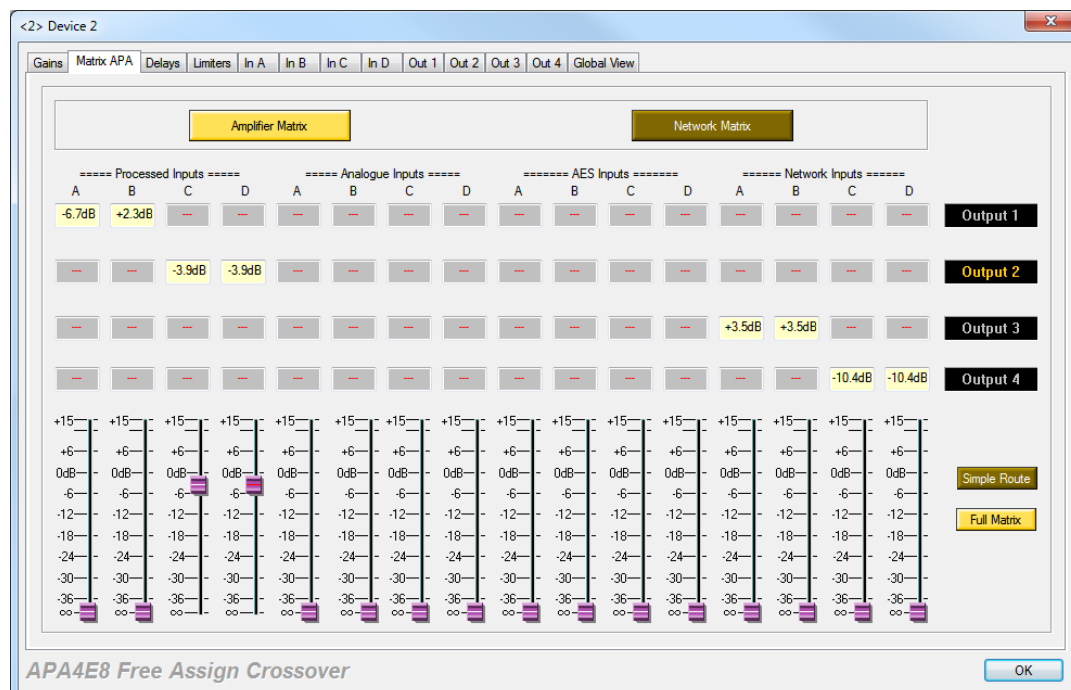


Amplifier and network matrices are identical in operation and offer simple mode where a double click on any "crosspoint" will enable it, and up to four sends can be added in this way, with automatic scaling of the send levels to maintain a 0dB summed signal path.

Delta Series, DPA Series, APA Series

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This is sufficient, in many cases, as a working method, but if required, the matrix can become a fully variable mix matrix with all source available at the same time.



The output labels on the right-hand side of this window now become selection buttons to choose what the fader bank at the bottom of the window displays.

Pulling a fader to minimum mutes the send from that source.

EQ and Other Differences

Note the following operation differences between APA, and Delta or DPA amplifiers:

- APA amplifiers have 18 bands of input EQ per channel, as opposed to the 8 bands on a Delta or DPA model
- APA amplifiers do not feature input mutes
- DEQ is currently not implemented on APA, Delta or DPA amplifiers but is under development for a future firmware release
- Delay is not pooled as on 4 Series – there is 650mS available on both inputs and outputs on all amplifiers
- Limiter thresholds are referenced to the maximum output of the amplifier model, and so will vary between devices. The aux outputs on Delta and DPA amplifiers are referenced to the line level output available as on 4 Series systems
- Auto limiter time constants are selectable separately for power amp outputs and aux outputs on Delta and DPA amplifiers

Grouping – Simplify Your System Control

Introduction

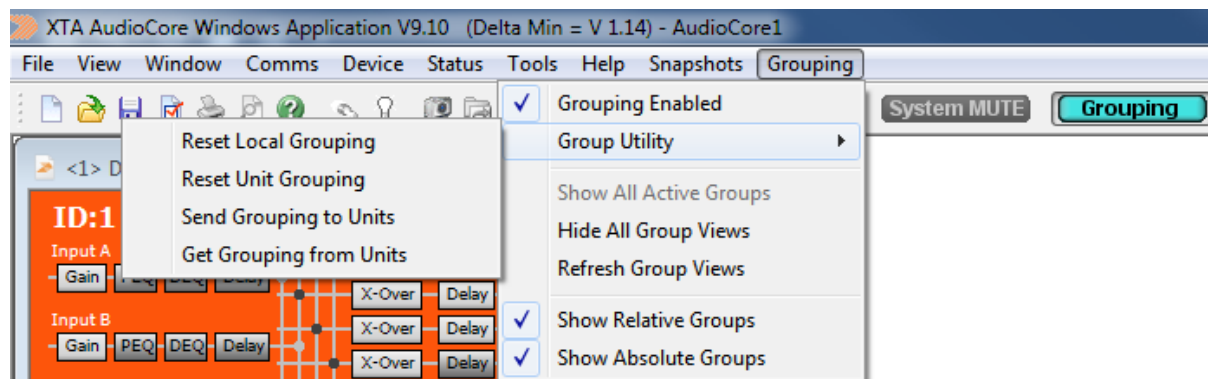
AudioCore Amped Edition is the first version to support an advanced grouping architecture that allows inputs or outputs on any amplifier to be grouped together and work as a single set of controls, thus reducing the number of parameters that have to be adjusted both during set-up and when making adjustments live in a show context.

Absolute groups work with channel EQ and all channels in a particular group will assume the same parameter values – for example, grouping input channels allows a single window to perform as system wide house EQ, or to EQ feeds to multiple outputs perhaps for delay towers or balcony fills. Any channel can only be a member of one absolute group for obvious reasons – if multiple absolute group membership was possible then all associated groups would in effect be set to the same value anyway!

Relative groups work with channel gains, mutes, delays and (on output groups) limiter thresholds. Relative groups allow offsets to be applied to a particular group of channels, and these offsets are applied as an aggregated value with the actual channel's value being preserved. Any channel can be in multiple relative groups, so a grouping architecture can be realized with logical outputs grouped, then effectively "nested" in another group, up to a "Master" group if required that combines the entire system.

Inputs and outputs cannot be combined in a group.

Checklist Before Using Groups



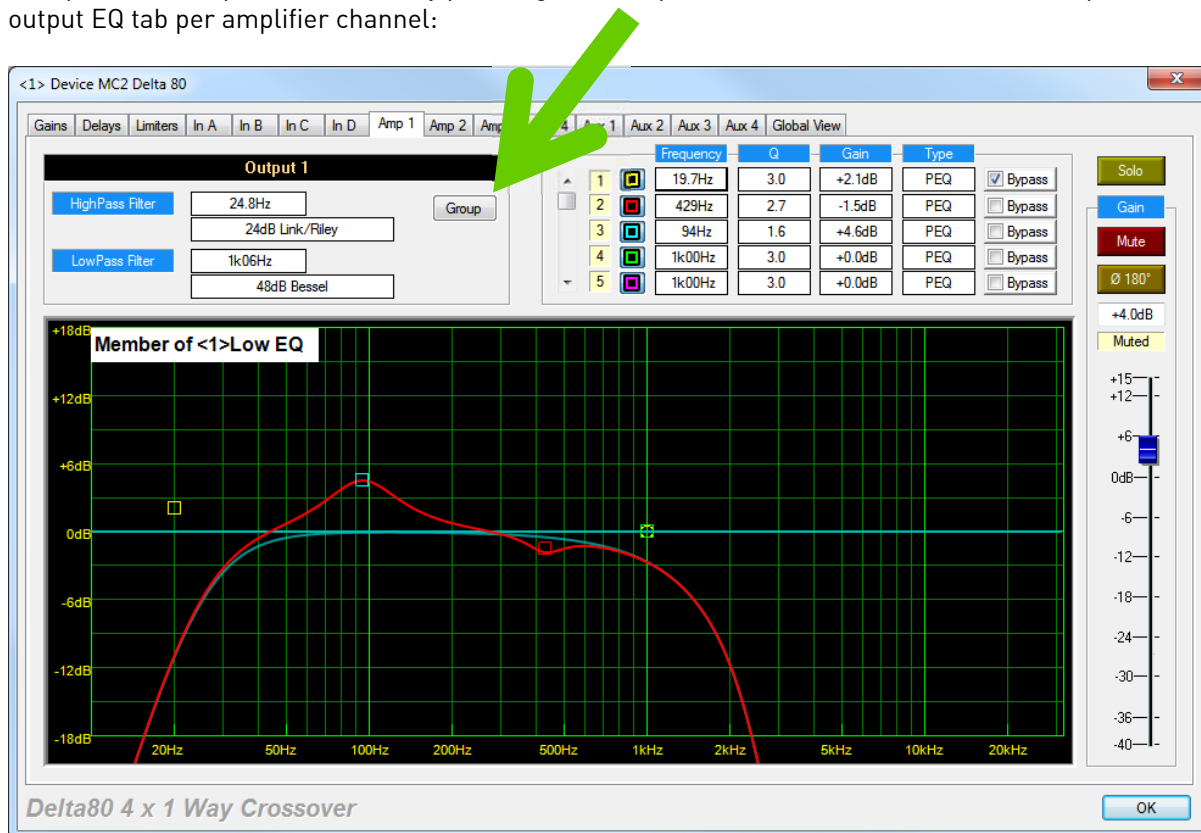
Check that Grouping is Enabled from the menu and that both Relative and Absolute Groups are set to "Show..". This will ensure the groups will appear on-screen as they are created and that the controls will actually adjust your system as you expect!

Best Practice Notes on Using Grouping

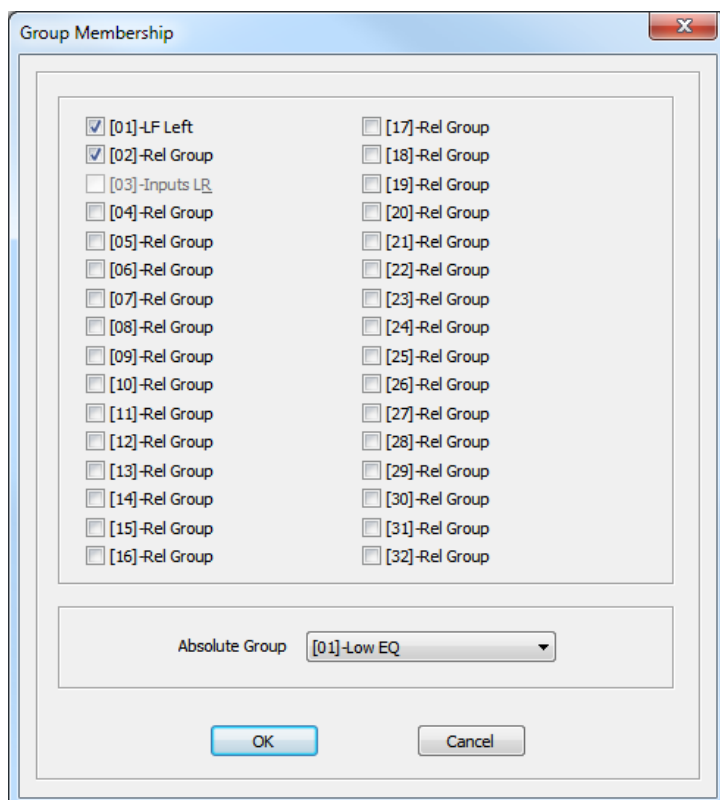
- ☑ **Set up your grouping structure before starting to configure the system.**
This will ensure that there will be no unexpected changes to output settings if they are added to a group after they've been configured.
- ☑ **Set up your grouping before enabling amplifier ganging.**
Using both ganging and grouping can be beneficial for local front panel control in smaller systems, but can quickly become confusing. Adding ganged channels to a group will only include the lowest number in the gang and so won't work as expected.
- ☑ **Keep grouping as simple as possible.**
Grouping is designed to reduce system complexity – adding more groups than necessary only increases chances of error – an accidental mute or group solo can silence a system!
- ☑ **Don't use copy and paste on individual channels if they are in an absolute group.**
Absolute group settings will override the pasted settings, and will not be pasted across all channels in the group.
- ☑ **Avoid changes to grouping during a performance.**
This is especially true for relative groups as removing a channel from one has the potential for changes in level and limiter settings and could be dramatic or even disastrous!
- ☑ **Recall memories and presets before using grouping.**
Whilst this sounds counter-productive compared to the first note, channels in absolute groups will not respond to memory recalls as the absolute group EQ takes precedence.
- ☑ **Remember that preset with locked settings will override group EQ.**
As preset locking is on a band-by-band basis for EQ, some bands may be locked and these will be recalled in individual amplifiers and will ignore absolute group EQ.

Setting Up Groups Within AudioCore

Group membership is established by pressing the Group button shown on each individual input or output EQ tab per amplifier channel:



This will display the group membership window:



There are 32 relative groups and 32 absolute groups available.

The relative groups are displayed as table of tick boxes – any channel can be a member of any or all groups (as long as the type matches – that is input or output group). The group type is selected by the addition of the first member and so isn't restrictive.

Greyed out groups are unavailable as they are the opposite type to the current channel selection – as in this example relative group 3 is unavailable as it is an input group and this is a group membership window for an output channel.

Absolute group membership is on a single membership basis and so this is accessed from the drop-down list. Again, groups of the wrong type will be filtered out automatically.

A word of warning...

Selecting any channel for grouping, especially absolute grouping will force it to immediately assume the group settings (and for absolute EQ groups this is FLAT and NO CROSSOVERS) as soon as OK is pressed! Be careful when making changes to group membership especially during a performance!

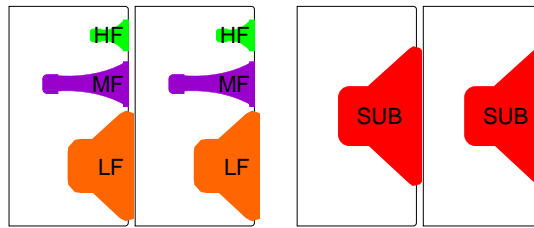
Assignment of an absolute group will be displayed in the individual channel's EQ response window



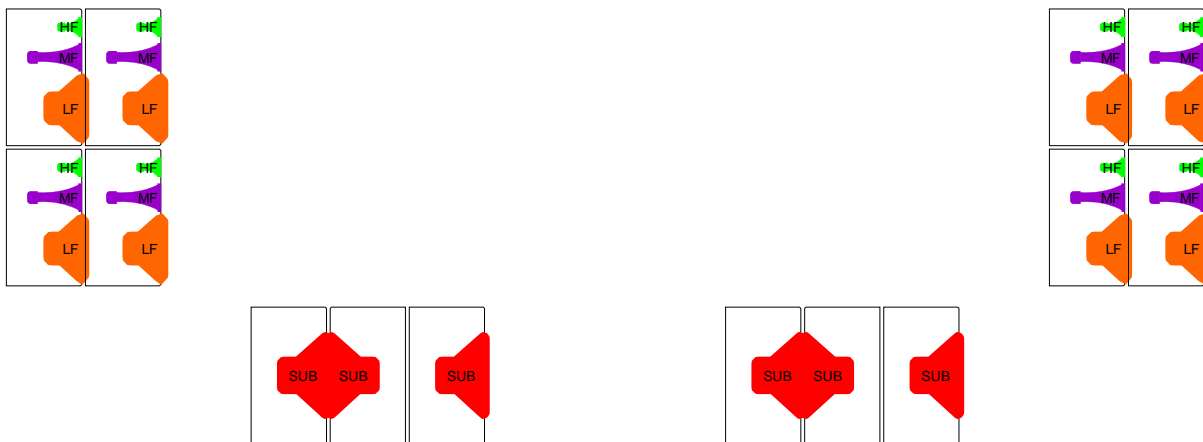
Note that adjusting the EQ on an individual channel when it is a member of an absolute group will also change the EQ for all other members. We recommend using the group EQ window for all adjustments to grouped EQ channels to avoid confusion. Note also, that copy and paste will not work across grouped channels in this version of AudioCore.

Working with Relative Groups

A typical system will consist of two or more multi-way cabs, and separate sub-woofer enclosures:



With most sizeable set-ups, this likely to involve multiple full range cabs (the three-way ones) arranged left and right in clusters, with multiple subs positioned below these or in front of the stage:



Note that the sets of three subs have the middle cabinet reversed, in a cardioid arrangement. This system can be usefully split up into the following groups:

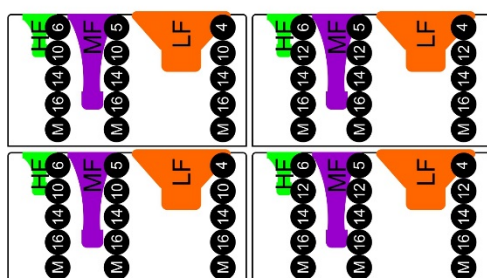
- 1) Reverse polarity subs: Middle sub from each pair (assuming symmetric placements)
- 2) Normal polarity subs: Other four sub enclosures
- 3) Subs: Combining both reverse and normal polarity enclosures
- 4) LF Left: Low frequency drivers in left hand cabs
- 5) MF Left: Mid horns in left hand cabs
- 6) HF Left: High frequency drivers in left hand cabs
- 7) LF Right: Low frequency drivers in right hand cabs
- 8) MF Right: Mid horns in right hand cabs
- 9) HF Right: High frequency drivers in right hand cabs
- 10) Top Row Left: LF+MF+HF both top row left hand cabs
- 11) Top Row Right: LF+MF+HF both top row right hand cabs
- 12) Bottom Row Left: LF+MF+HF both bottom row left hand cabs
- 13) Bottom Row Right: LF+MF+HF both bottom row right hand cabs
- 14) All Full Left: All four cabs left
- 15) All Full Right: All four cabs right
- 16) All Full Range: All full range cabs

System Master: All cabs and subs

The diagram overleaf shows the assignment of all drivers to their respective relative groups.

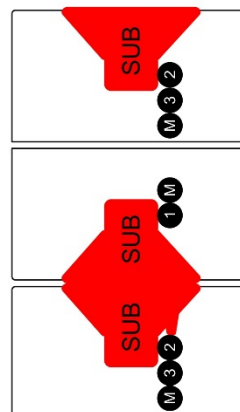
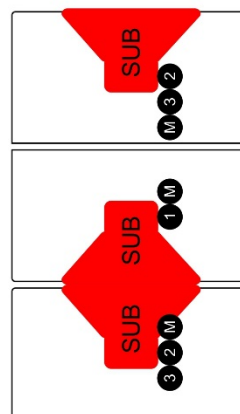
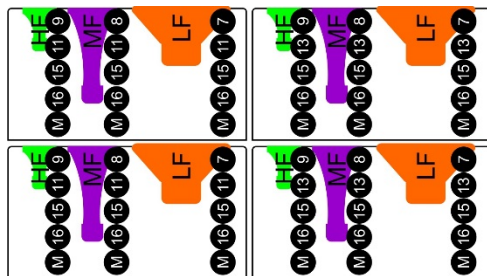
Delta Series, DPA Series, APA Series

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- 1 Reverse polarity subs
- 2 Normal polarity subs
- 3 Subs master
- 4 LF left
- 5 MF left
- 6 HF left
- 7 LF right
- 8 MF right
- 9 HF right

- 10 Top row full left
- 11 Top row full right
- 12 Bottom row full left
- 13 Bottom row full right
- 14 All full left
- 15 All full right
- 16 All full range
- M System master: Everything!



This example system, whilst not necessarily large in scale, provides a very “granular” level of control that may not be necessary in many circumstances. For example – this could be simplified to perhaps top and bottom row cabinets, all LF drivers (for limiter control), and Subs. The left/right/master can be controlled “upstream” via the stereo feed to the system.

However, let's carry on with the example to explain how the parameter aggregation works and how it is displayed in the software.

Consider the most complex grouping scenario in the example (so a channel that is a member of the most groups) – this would be any of the individual drivers in the full range cabs. Each driver is a member of five groups. For an LF driver in a top left cab in this system:

LF drivers in left hand cabs (Group **4** – set to -1.0dB)

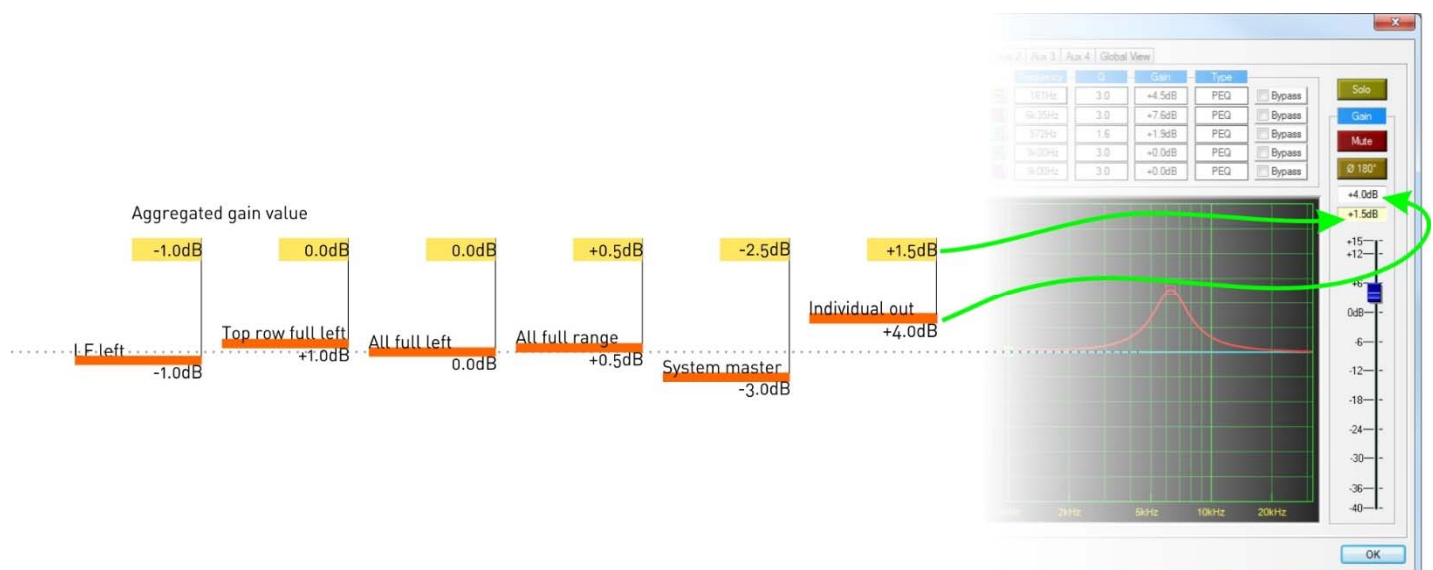
Top row all left (Group **10**: set to +1.0dB)

All left (Group **14**: set to 0.0dB)

All full range (Group **16**: set to +0.5dB)

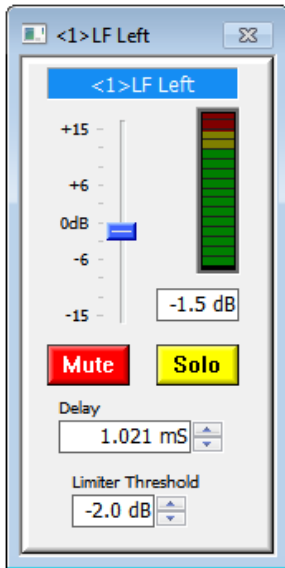
System master (Group **M**: set to -3.0dB)

This means, that, in addition to the actual amplifier channel output gain control, there are five other possible places where the gain of this output can be affected. All these values are added together to give a final resulting gain value that is displayed with the actual channel's original gain setting:



So the final value of this output's gain is $-1.0 + +1.0 + +0.0 + +0.5 + [-3.0] + [+4.0] = +1.5\text{dB}$

Additional Relative Group Controls



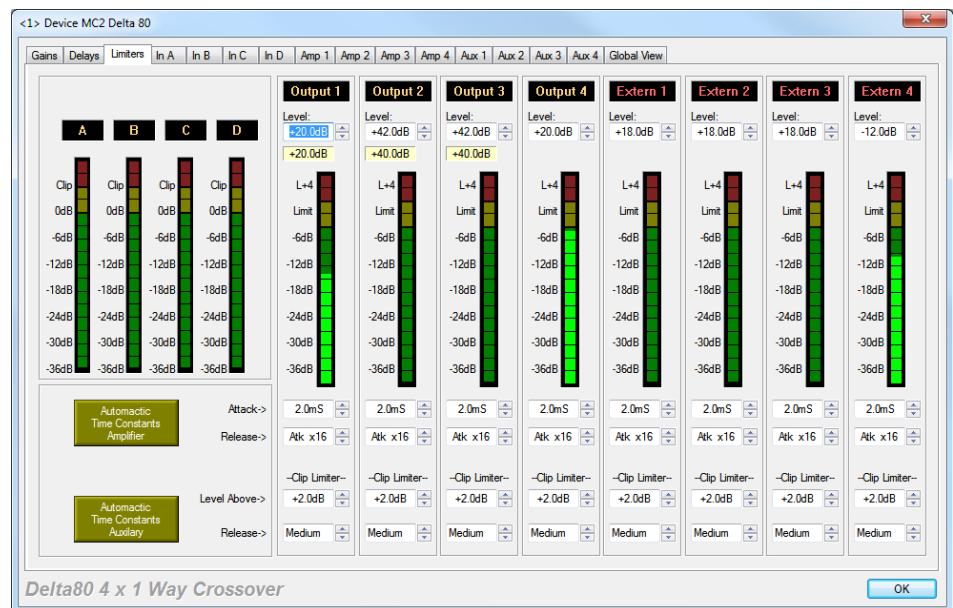
In addition to relative gain adjustments, it is also possible to adjust delay, and group limiter threshold.

Group limiter threshold adjustment can only be negative or “downwards” (so limiter protection can only be increased through use of group controls).

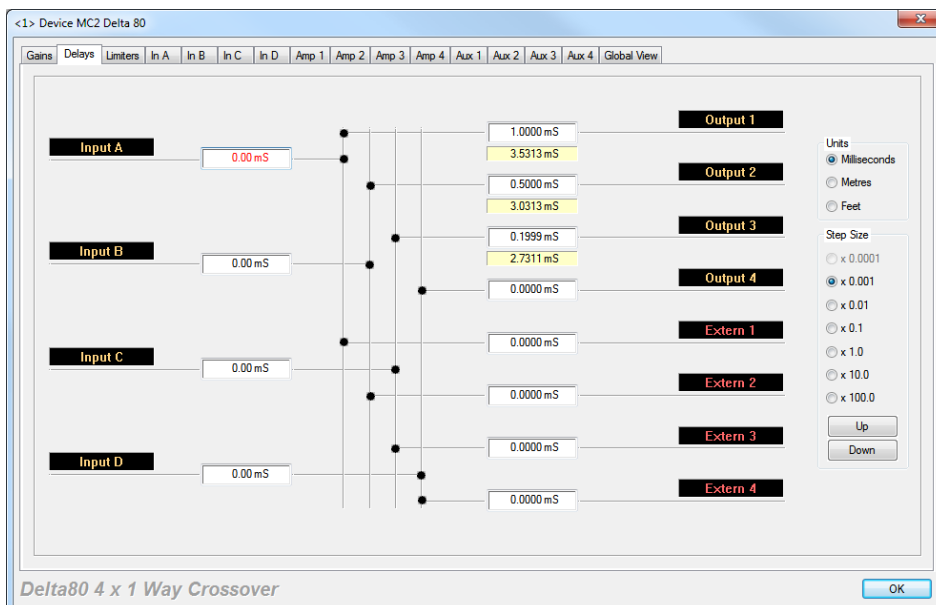
Delay can only be additive, so you cannot move delay negative relative to the channel's original value.

Aggregated delay values and limiter thresholds are displayed in AudioCore during direct device editing in a style consistent with the aggregated gain values as shown previously:

Outputs 1-3 are members of groups and the aggregated limiter threshold is displayed in the yellow box below the actual channel limiter adjustment.

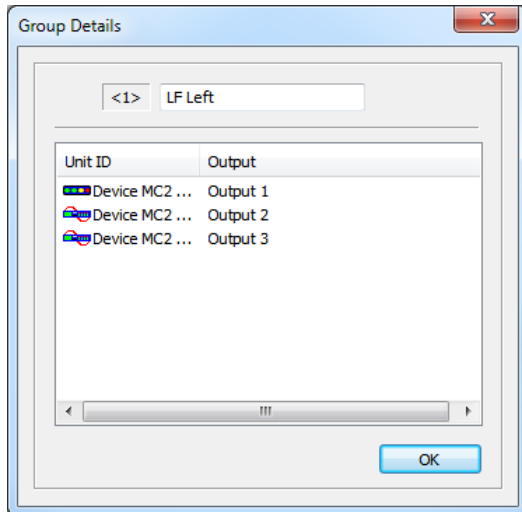


Outputs 1-3 are members of groups and the aggregated delay value is displayed in the yellow box below the actual channel delay value.



Mute and Solo buttons will potentially silence large parts of your system (especially Solo) so use these buttons with care!

The meter shown on the group control panel by default shows the metering for the lowest numbered channel in the group (based on channel and ID). This can be changed to a different metering point and the group name changed by right clicking on the meter or the name to display the group details window:



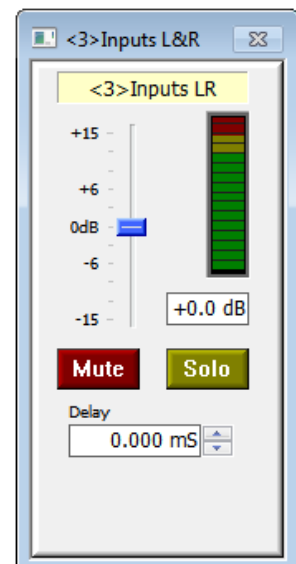
Group members are shown in the list and a double click on any channel will move the metering point. In this example, the metering point is output 1.

The name can be directly edited by typing in the text box.

As with absolute group windows, the size of the window can be selected by clicking on the icon top left and choosing small, medium or large window size:



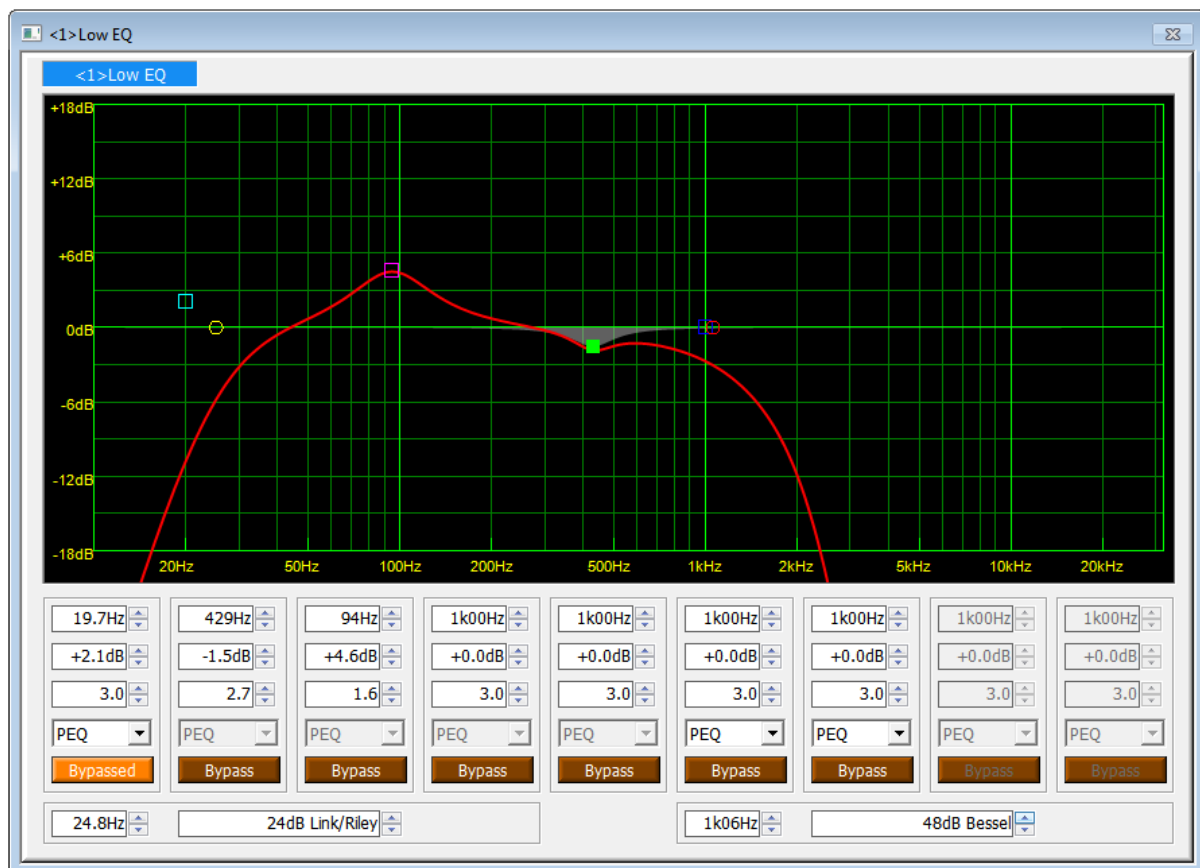
Relative input groups follow the same rules as output groups, but have no limiter threshold control (as there are no input limiters!). Their name panel is coded yellow as opposed to blue:



Working with Absolute Groups

Absolute groups are so named because they should only be used after consumption of vodka. They are used for controlling multiple channels of EQ and can contain either input or output channels but not both. Output channel groups can additionally gain access to crossover filters.

As the name would suggest, all settings for absolute groups are applied to all channels and there are no relative offsets – what you see is what the channel members will be doing! The only exception to this rule is when considering outputs with locked parameters (parameters in a crossover preset). This will be explained in a later section.

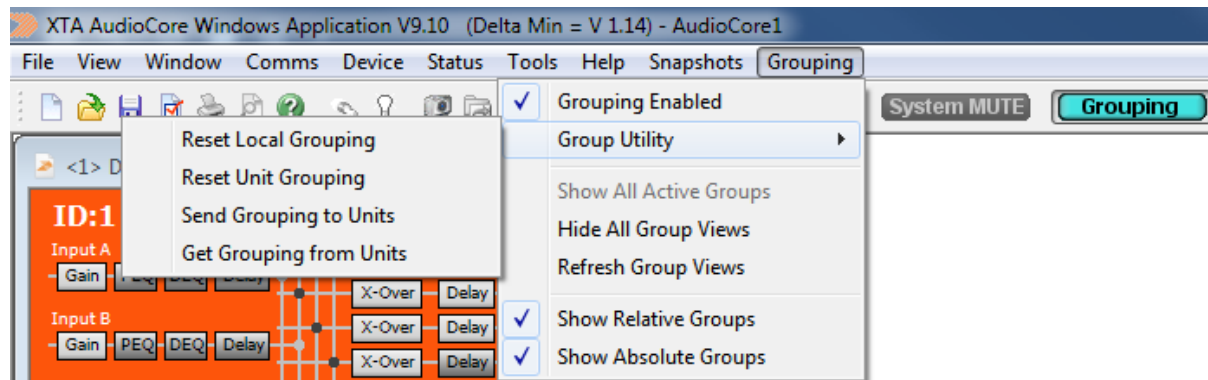


This is an output absolute group (as it includes crossover filters). Note that the same rules apply for 48dB filters as on 4 Series processors – bands 8 & 9 are disabled as the low pass filter is set to 48dB/Octave.

Input absolute groups are the same but do not include crossover filters. Despite there being more input EQ available on APA amplifiers, the number of bands available in an input group is limited to eight bands to ensure compatibility with Delta and DPA amplifiers. Ungrouped bands of EQ in APA input processing channels are still available locally to the device for adjustment.

Window size can again be selected by left clicking on the top left icon or via a right click on the window which will cycle through small - medium - large window sizes.

Additional Group Controls and Utilities



Grouping data (memberships, absolute EQ settings, relative group offsets) is stored in each amplifier and so can be retrieved and the grouping architecture built from an online system. Group control is remembered by the AudioCore file in use and so will be reenabled or disabled when the file is opened.

Be aware that, even with grouping disabled, amplifiers will store group data changes so will show remote group messages on screen, and this is also true whether they are group members or not!

As with adding channels to groups during a performance, switching grouping on or off could have a major effect on the system so proceed with caution!

This is especially true of *disabling* grouping on a system with lots of relative output groups – any aggregated changes to gains or limiter thresholds will immediately be removed system-wide when grouping is disabled!

EQ applied with absolute groups will not change state when grouping is disabled, but it will be applied if grouping is turned on, so remember that default group EQ is FLAT and so this will apply to all group members when grouping is enabled!

Clearing and Syncing Grouping Data

Grouping is automatically synced when going on-line (as long as “Groups” is checked on the Comms Control Window prior to sync. There may be circumstances where group adjustments can leave the system in a seemingly undetermined state. This could happen when a group is muted and then a channel is removed from the group, or if a group is soloed and the amplifier is disconnected from the network.

There is no front panel method for switching off group mutes - whilst they are indicated using the mute buttons, they cannot be disabled using the local mutes.

If in doubt, it is possible to remotely clear all group information from all amplifiers using the Reset Unit Grouping command from the Grouping Utility menu as above. If grouping is to be used, it should then be reinstated in the amplifiers by choosing Send Grouping to Units.

Local grouping data (so, data in the AudioCore file) can be cleared using Reset Local Grouping.

To clear grouping data in a single amplifier via the front panel, press ENTER + MUTE 1 – remember this may result in a sudden change in level or EQ on all channels!

Working with Memories, Presets and Snapshots

Users of AudioCore will know that memories, presets and snapshots are all slightly different ways to store and recall settings across individual devices or entire systems.

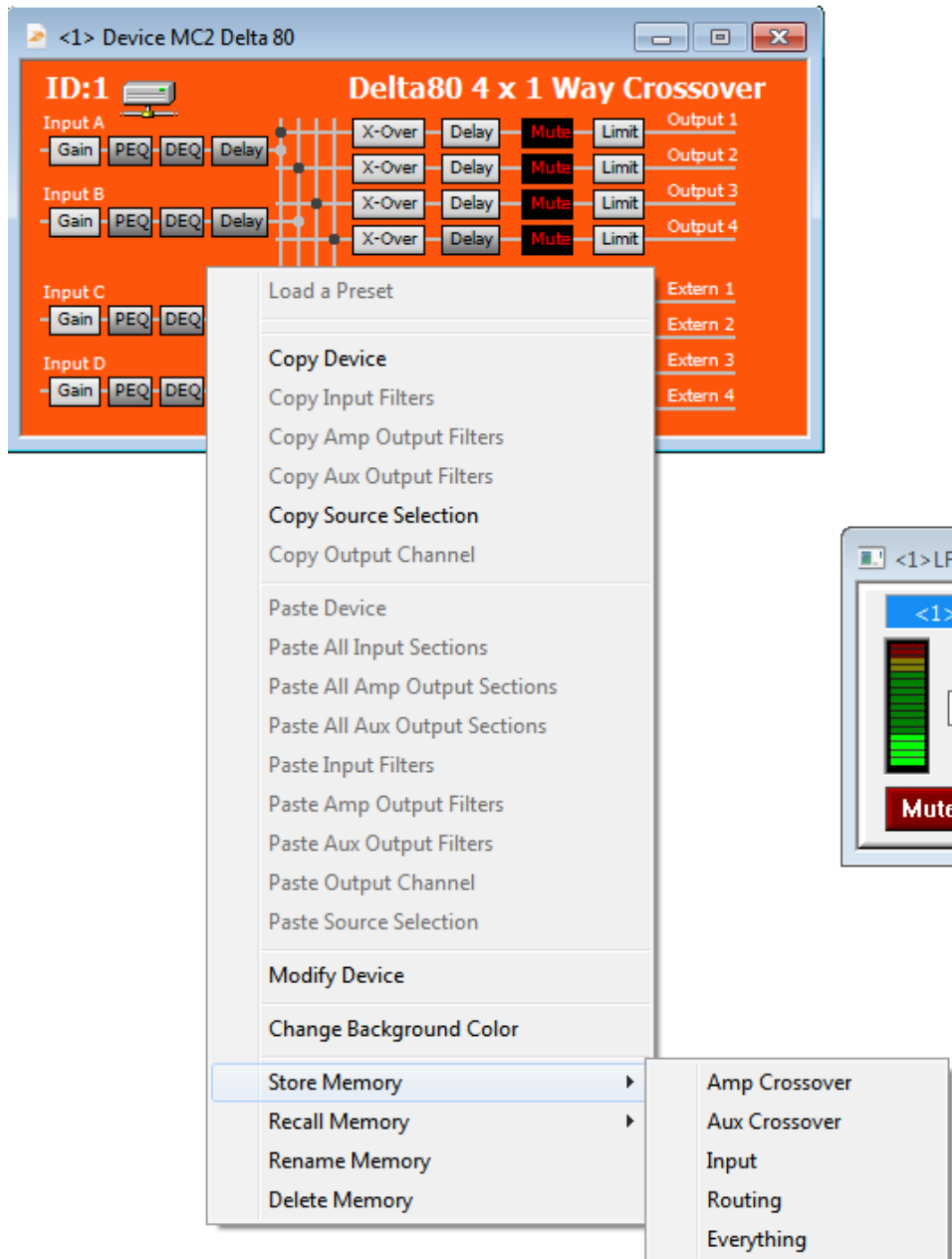
Storing and recalling memories works at an individual amplifier level, and the options available for what to store vary per amplifier type. For example, Delta and DPA amplifiers allow the user to store and recall amplifier settings (first four output channels' processing), aux settings (last four output channels' processing), input settings (four input channels' processing) and routing (AES, source selection, network output source) or everything.

Snapshots should be viewed as the equivalent of choosing to store "Everything" on all amplifiers, in the same numbered location, with the same name. Subsequently recalling "Everything" on an amplifier will show this snapshot in the list of available memories, as well as when recalling directly from the Snapshot menu.

Presets refer to output channel data, and are read only files designed to configure speaker systems, as supplied by the speaker manufacturers. As such they contain all crossover and EQ settings, as well as limiter settings, output delays, and gain and polarity information. They also may contain routing information for multiway designs.

Significantly, presets may also have parameters locked so that they cannot be viewed or adjusted by the user. This feature is defined on a preset by preset basis and is programmed by the speaker manufacturer. Neither XTA nor MC² can bypass this locking.

Recalling or storing memories on individual amplifiers is via a right click on the device window and choosing the type required:



Recalling and storing snapshots is via the Snapshots menu, but works in the same manner. Be aware that storing snapshots may overwrite settings stored locally in all devices, so it is good practice to ensure that the chosen memory number for the snapshot is not in use with locally stored important settings.

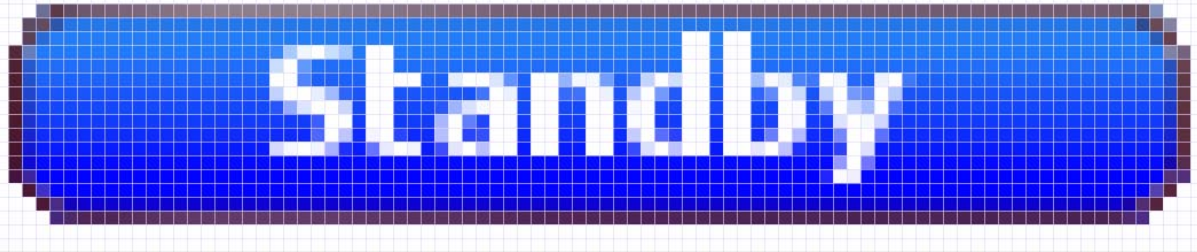
Presets with locked EQ parameters will ignore absolute group EQ bands (including locked crossover filters if appropriate) and so some bands may not respond to group EQ changes. This is by design to prevent adjustment of crucial parameter settings as designed by the speaker manufacturer. Relative group adjustments to gain, delay and limiters (only to further increase the limiter protection) will still be applied to even locked parameters.

Delta Series, DPA Series, APA Series

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And Finally – The Most Important New Feature



If it all gets too much – hit the standby button, switch everything off and go home!