Delta Series, DPA Series, APA Series

Grouping Architecture

AUDIOCORE dsp

AMPED EDITION

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 MC^2 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:
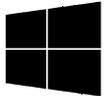
Windows XP
Windows 7: 32 and 64 bit editions
Windows 8.1
Windows 10: 32 and 64 bit editions

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.

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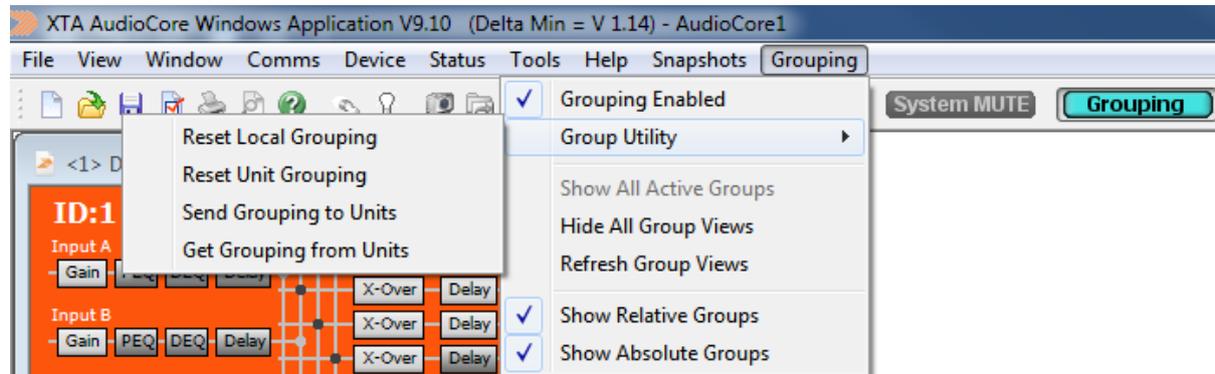
Check that Grouping is Enabled from the menu and that both Relative and Absolute Groups are set to "Show..". This will ensure the groups will appear on-screen as they are created and that the controls will actually adjust your system as you expect!

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:

Delta80 4 x 1 Way Crossover
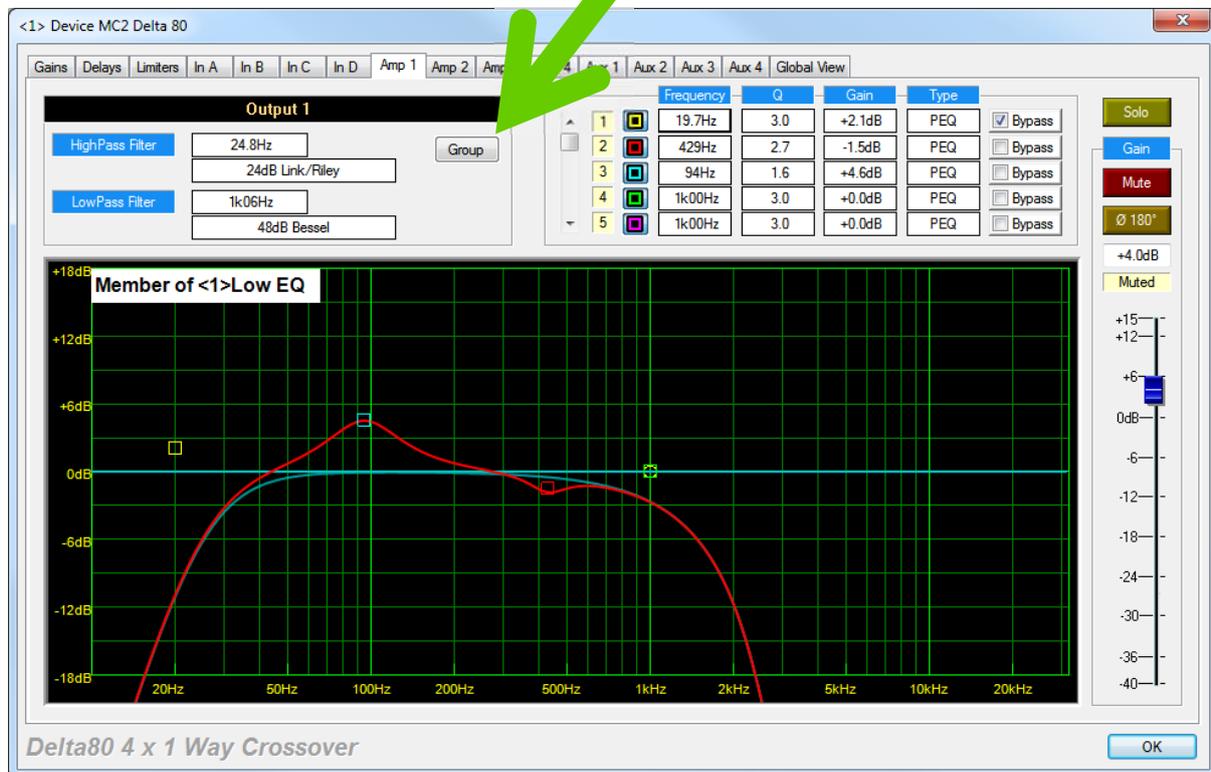
This will display the group membership window:
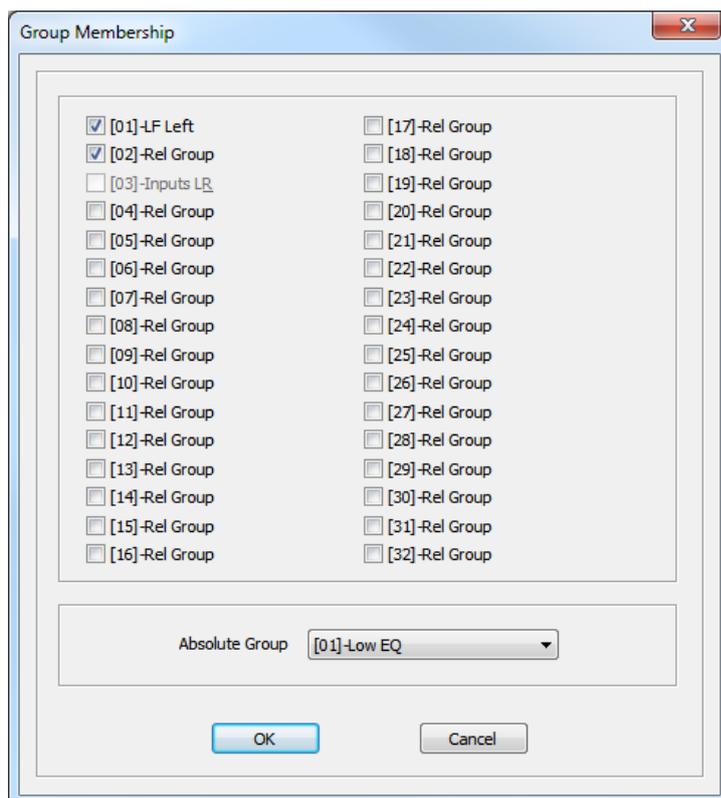
There are 32 relative groups and 32 absolute groups available.

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:
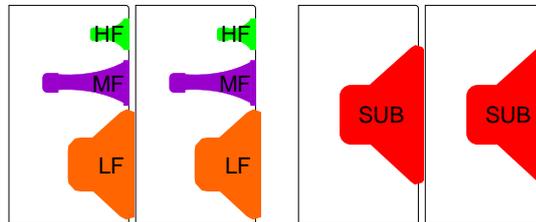
With most sizeable set-ups, this likely to involve multiple full range cabs (the three-way ones)
arranged left and right in clusters, with multiple subs positioned below these or in front of the stage:
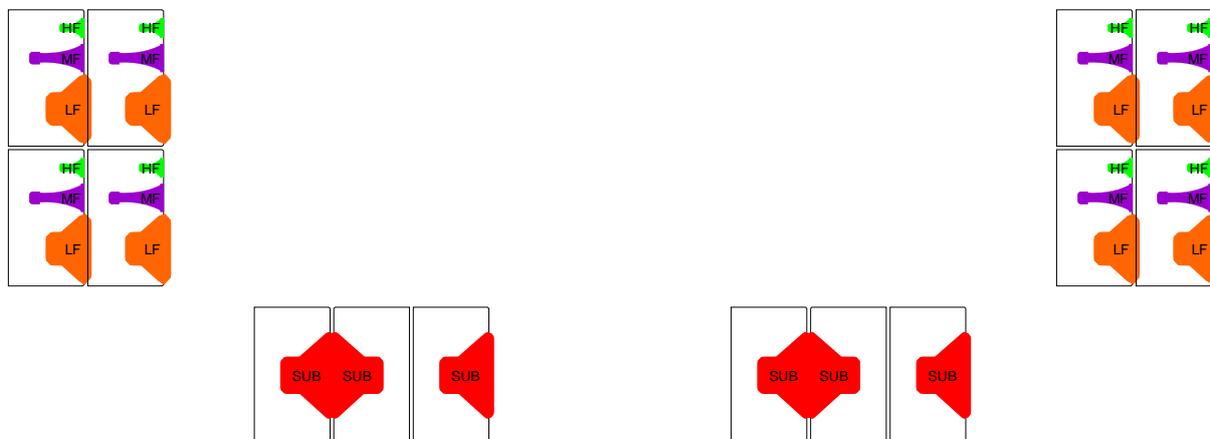
Note that the sets of three subs have the middle cabinet reversed, in a cardioid arrangement.
This system can be usefully split up into the following groups:

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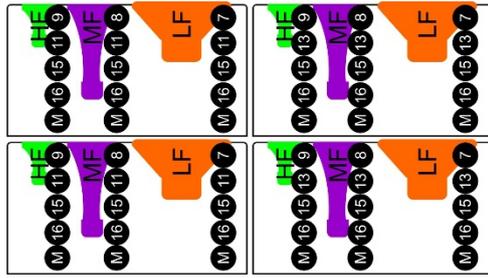
10 Top row full left
11 Top row full right
12 Bottom row full left
13 Bottom row full right
14 All full left
15 All full right
16 All full range
M System master: Everything!

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
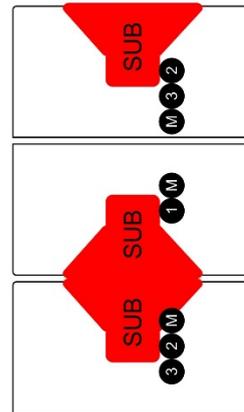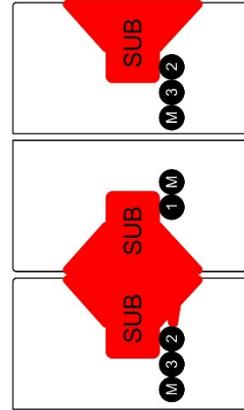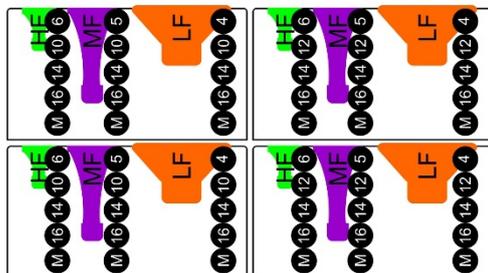
This example system, whilst not necessarily large in scale, provides a very "granular" level of control that may not be necessary in many circumstances. For example – this could be simplified to perhaps top and bottom row cabinets, all LF drivers (for limiter control), and Subs. The left/right/master 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:
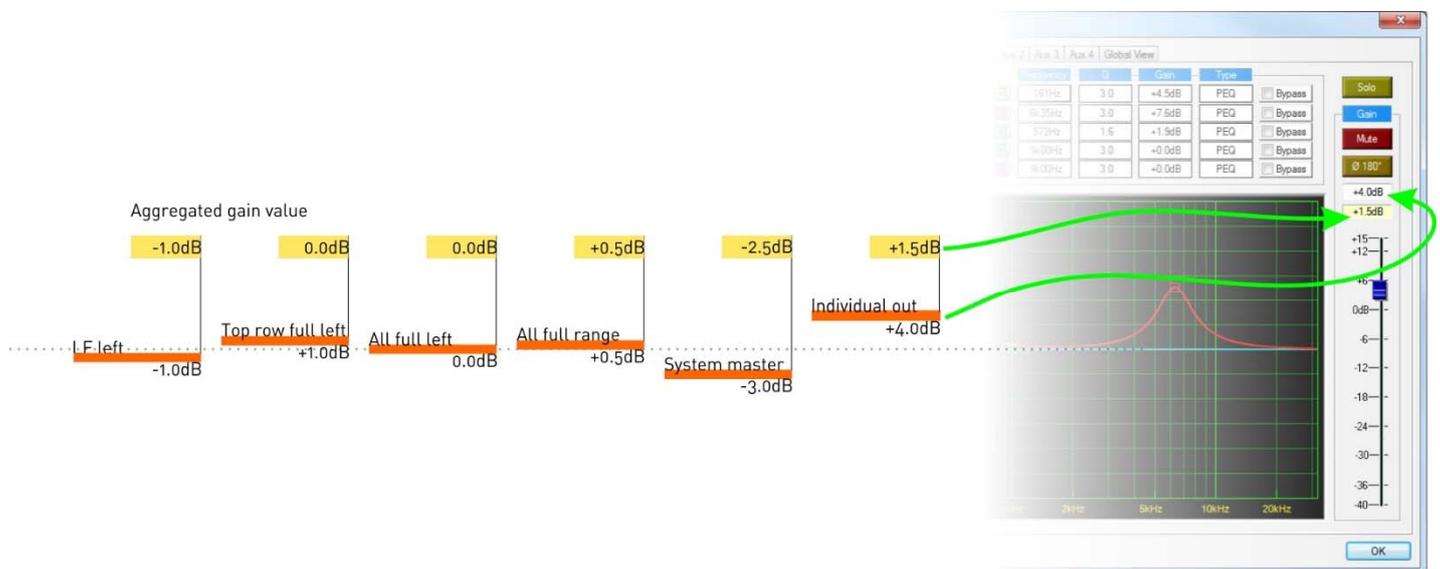
So the final value of this output's gain is –[1.0] + [+1.0] + [0.0] + [+0.5] + [-3.0] + [+4.0] = +1.5dB

Additional Relative Group Controls

Outputs 1-3 are members of groups and the aggregated limiter threshold is displayed in the yellow box below the actual channel limiter adjustment.
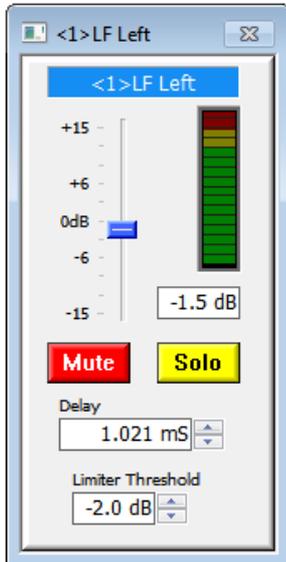
In addition to relative gain adjustments, it is also possible to adjust delay, and group limiter threshold.

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 delay value is displayed in the yellow box below the actual channel delay value.
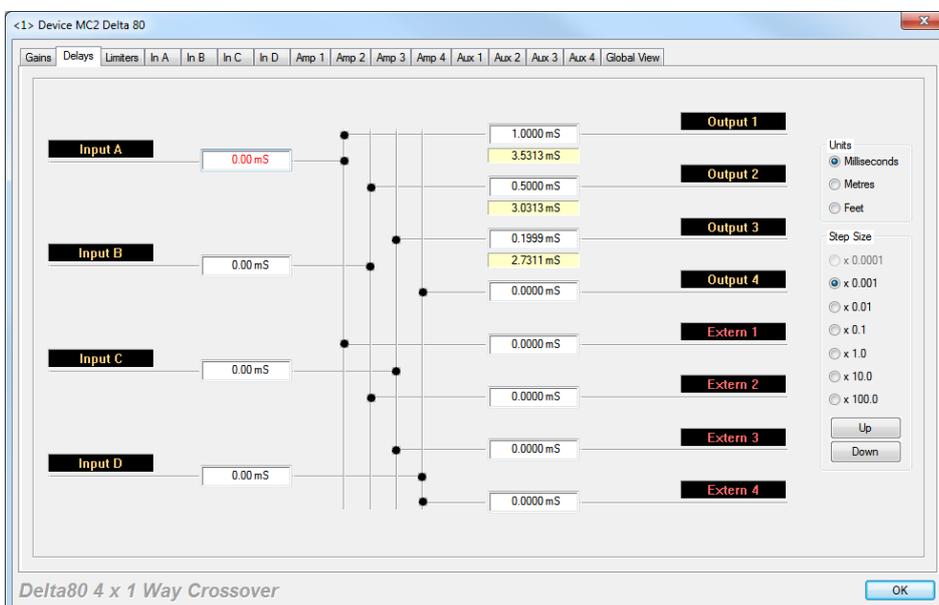
Mute and Solo buttons will potentially silence large parts of your system (especially Solo) so use these buttons with care!

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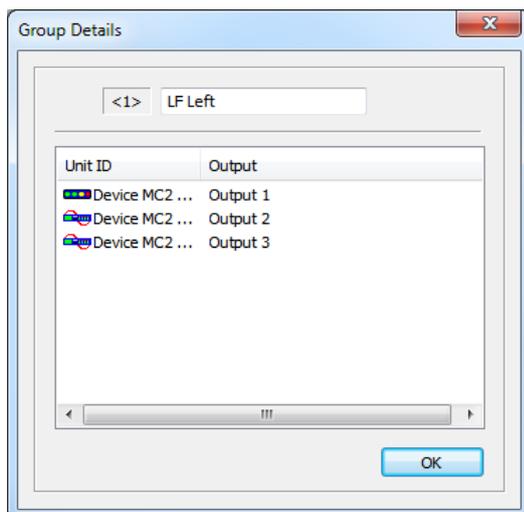
Group members are shown in the list and a double click on any channel will move the metering point. In this example, the metering point is output 1.

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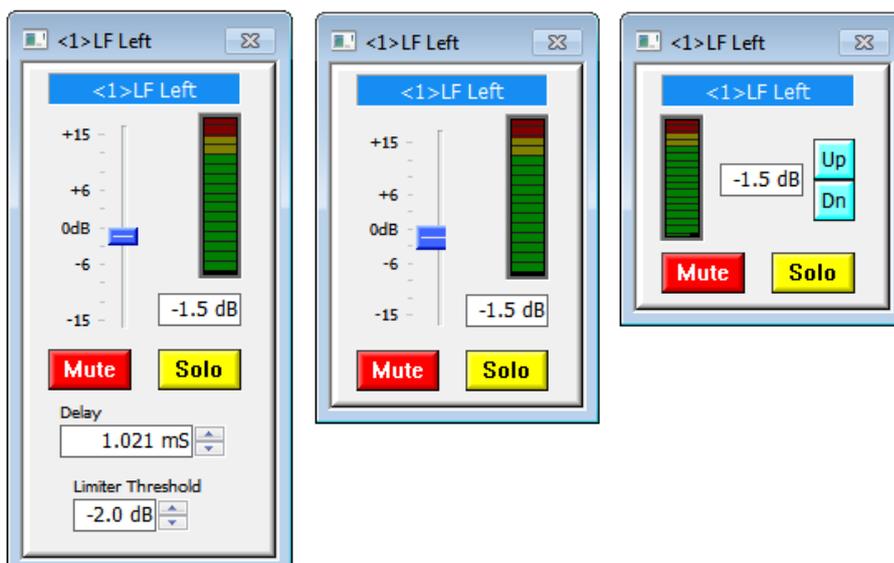
Relative input groups follow the same rules as output groups, but have no limiter threshold control (as there are no input limiters!). Their name panel is coded yellow as opposed to blue:
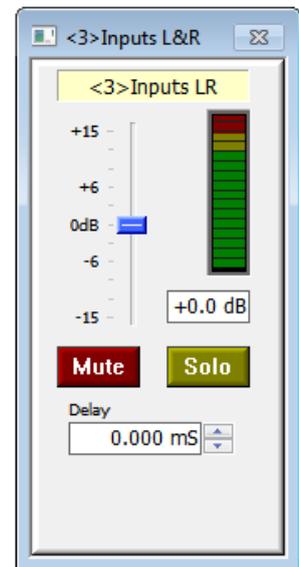
Working with Absolute Groups

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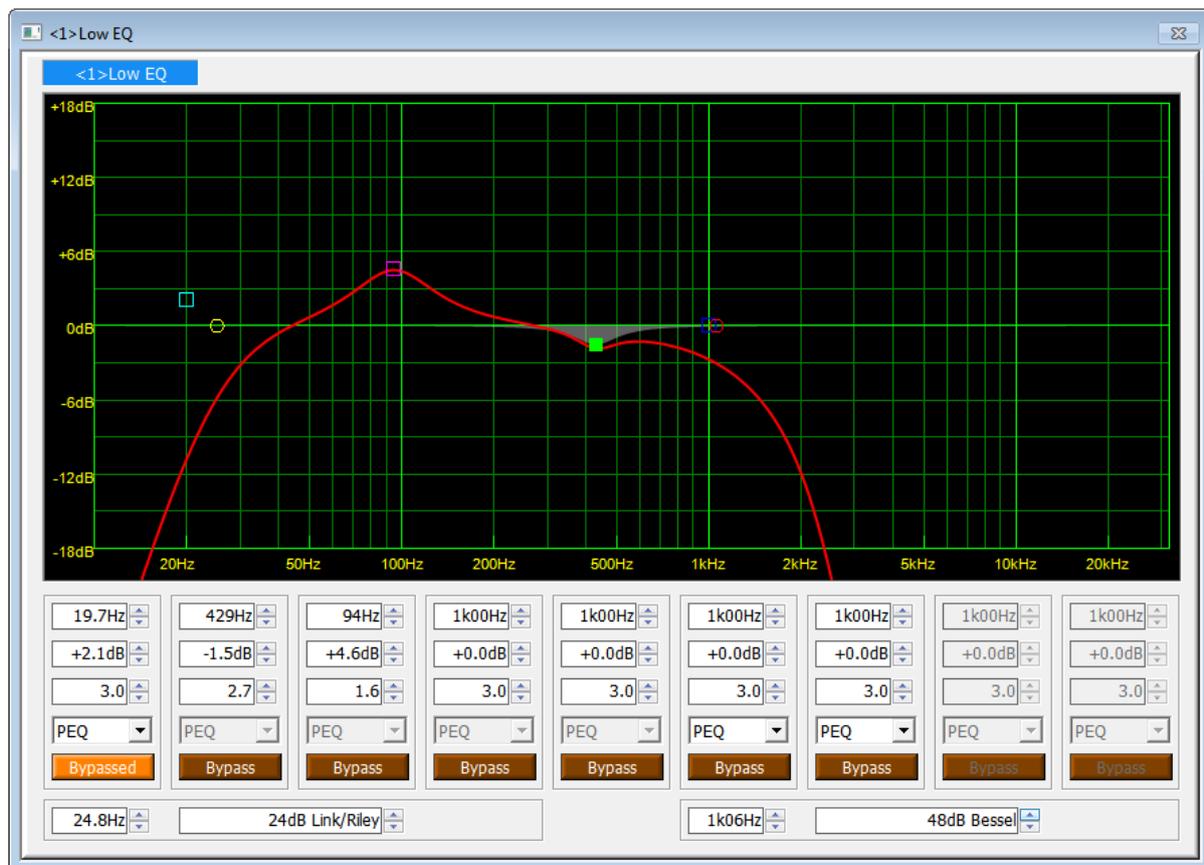
This is an output absolute group (as it includes crossover filters). Note that the same rules apply for 48dB filters as on 4 Series processors – bands 8 & 9 are disabled as the low pass filter is set to 48dB/Octave.

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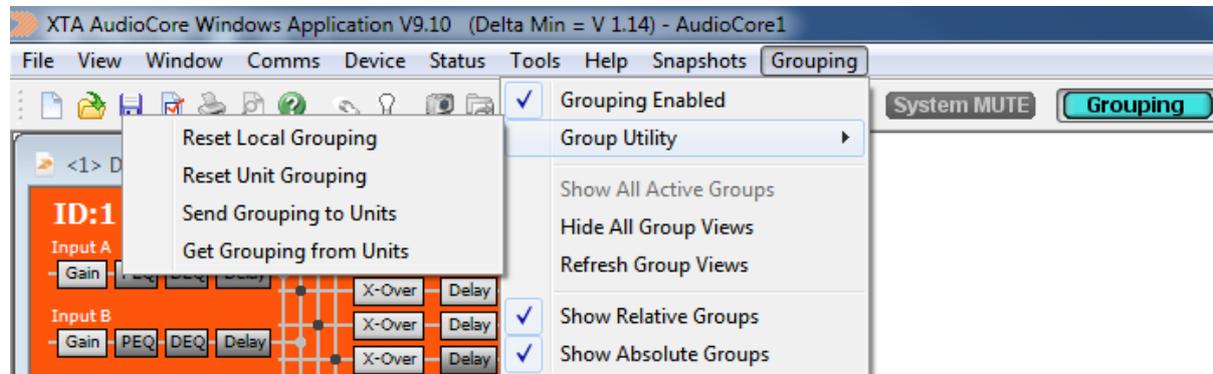
Grouping data (memberships, absolute EQ settings, relative group offsets) is stored in each amplifier and so can be retrieved and the grouping architecture built from an online system. Group control is remembered by the AudioCore file in use and so will be reenabled or disabled when the file is opened.

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 of 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 is a sudden change in level or EQ on all channels!