

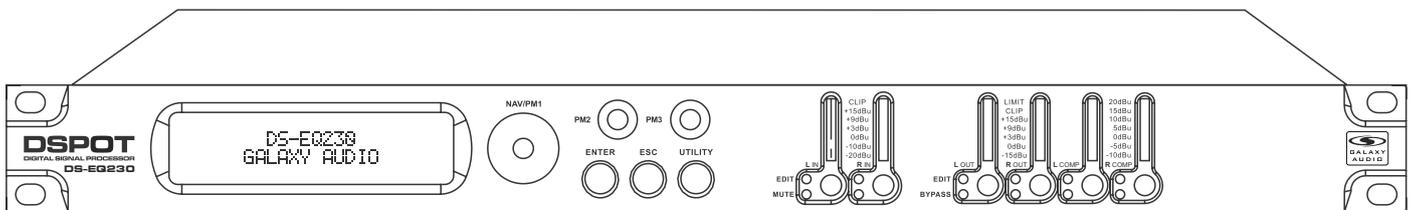
DS-EQ230



USER'S MANUAL

DSPOT

DIGITAL SIGNAL PROCESSOR



Dual Channel 30 Band EQ



MAKERS OF THE ORIGINAL
HOT SPOT PERSONAL MONITOR

Contents

Introduction.....	1
Safety Instructions.....	2
Overview.....	3
Getting Started with Front Panel Controls.....	4 - 27
Using the PC Interface.....	28 - 34
Volume Controls Table.....	35 & 36
Specifications.....	37

Introduction

Thank you for choosing a Galaxy DSPOT Digital Signal Processor. You have joined hundreds of thousands of other satisfied Galaxy customers. Since 1977 Galaxy Audio's professional experience in design and manufacturing ensure our products' quality, performance and reliability.

For the most up to date manual and information
visit www.galaxyaudio.com.

Safety Instructions



This symbol indicates that dangerous voltage Constituting a risk of electric shock is present within this unit.



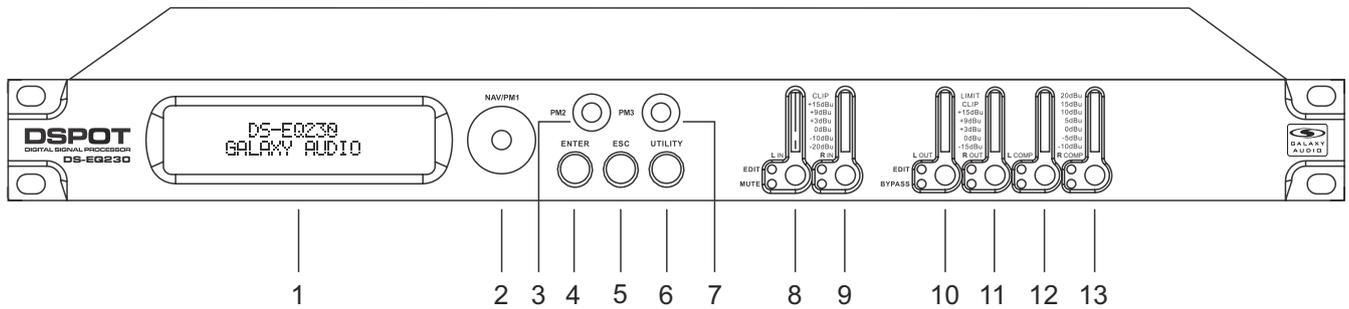
This symbol indicates that there are important Operating and maintenance instructions in the Literature Accompanying This Unit

! IMPORTANT SAFETY INSTRUCTIONS !

1. READ these instructions.
2. KEEP these instructions.
3. HEED all warnings.
4. FOLLOW all instructions.
5. DO NOT use this apparatus near water.
6. CLEAN ONLY with dry cloth.
7. DO NOT block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. DO NOT install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. DO NOT defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. PROTECT the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. ONLY USE attachments/accessories specified by the manufacturer.
12.  USE only with a cart, stand, tripod, bracket, or table Specified by the manufacturer, or sold with the Apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. UNPLUG this apparatus during lightning storms or when unused for long periods of time.
14. REFER all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. DO NOT expose the apparatus to dripping and splashing. DO NOT put objects filled with liquids, such as vases, on the apparatus.
16. Remove the batteries from the receiver if the system will not be used for a long period of time. This will avoid any damage resulting from a defective, leaking battery.
17. DO NOT throw used batteries into a fire. Be sure to dispose of or recycle used batteries in accordance with local waste disposal laws.

Overview

Described below are the functions of the front panel control buttons and encoders for the DS-EQ230.



- 1 - LCD Display
- 2 - Navigation/Parameter 1 Key
- 3 - Parameter 2 Key
- 4 - Enter Key
- 5 - Escape Key
- 6 - Utility Key
- 7 - Parameter 3 Key
- 8 - Left Input Edit/Mute Key
- 9 - Right Input Edit/Mute Key
- 10 - Left Output Edit/Bypass Key
- 11 - Right Output Edit/Bypass Key
- 12 - Left Comp Edit/Bypass Key
- 13 - Right Comp Edit/Bypass Key

Getting Started

As soon as the DS-EQ230 is turned ON the device model name will appear in the LCD screen:



A status bar will show the progress of the DS-EQ230 initialization process:



The DS-EQ230 has eight factory pre-set: "Default Flat", "Default Classic", "Default Disco", "Default Jazz", "Default Pop", "Default RnB", "Default Rock" and "Default Vocal".

After the initialization, the DS-EQ230 will show on the LCD the first of the embedded preset, or the last one selected prior to the unit being turned off.

First time activation will default to the first of the preset:



• Encoders and ENTER, ESC buttons

The DS-EQ230 is equipped with 3 Relative Encoders, “NAV/PM1”, “PM2” and “PM3”. These encoders allow you to navigate the user interface and edit sections of the processor. They allow the user to navigate within the screen for the selection of sub-menus, pages and parameters and to select the values to be assigned during the editing operations.

The “ENTER” and “ESC” buttons allow the user to confirm or NOT confirm the operations performed by the encoders.

• UTILITY, LIN/RIN and LOU/ROUT/LCOMP/RCOMP buttons

The UTILITY button allows the User to enter the Sub-menus and set the general characteristics of the Equalizer. The LIN and RIN buttons allow the User to enter the Editing Menus of the Equalizer’s Input Channels or to MUTE the Equalizer’s Outputs.

LOU/ROUT and LCOMP/RCOMP buttons, allow the User to access UTILITY functions related to the Equalizer (LOU/ROUT) or to enter the Editing Menus of the Equalizer’s Compressors Section (LCOMP/RCOMP).

The BYPASS functions allows to bypass the Equalizer setting (LOU/ROUT) or the Compressor setting (LCOMP/RCOMP).

As understood, the LIN/RIN as well as the LOU/ROUT and LCOMP/RCOMP buttons have double functions dependent on the push and hold time.

When the LIN/RIN buttons are pushed and held for more than one second, Input Channels LIN or RIN are either muted or unmuted. The red LED will illuminate when the Channel is muted. When the “MUTE” LED is OFF, then the related Input Channel is UN-MUTED.

A momentary push of the LIN/RIN buttons enters the Editing Mode for the Equalizer’s Channels (see later for the Equalizer’s Channel Editing details). The blue “EDIT” LED will now be ON.

When the LOU/ROUT buttons are pushed and held for more than one second, the Equalizer will go into bypass and the red LED will illuminate indicating bypass. To remove from bypass push and hold again for more than one second, the red LED will turn off indicating the Equalizer is now in circuit.

When the LCOMP/RCOMP buttons are pushed and held for more than one second, the Compressor will go into bypass and the red LED will illuminate indicating bypass. To remove from bypass, push and hold again for more than one second. The red LED will turn off indicating the Compressor is now in circuit.

A momentary push of the LOU/ROUT buttons enters Utilities’ functions for the Equalizer’s Channels (see later for the Equalizer’s Utilities Functions details). The blue “UTILITY” LED will now be ON.

A momentary push of the LCOMP/RCOMP buttons enters the Editing Menu for the Equalizer’s Compressor Section (see later for the Compressor’s Editing details). The blue “EDIT” LED will now be ON.

• DS-EQ230 Menu and Sub-Menu Structures

As stated above, the start-up default screen is the following factory preset:

**DS-EQ230
Default Flat**

From this point, sub-menus are accessed using the “UTILITY”, “LOUT/ROUT”, “LCOMP/RCOMP”, “ENTER” and “ESC” buttons and all parameters and values are navigated by the “NAV/PM1”, “PM2” and “PM3” encoders. Please refer to the following menu structures:

• Menu "UTILITY" [access by pushing the "UTILITY" button]

From the “Default Screen”, it is possible access the “UTILITY” menu pushing the “UTILITY” button and the Sub-Menus pages can be selected just rotating clockwise and counter-clockwise the “NAV/PM1” encoder.

Once selected the sub-menu page, using the “ENTER” button can be accessed the Sub-Menus pages, again “scrollable” using the “NAV/PM1” encoder and accessible for the parameters’ editing pushing again the “ENTER” button.

Through the “ESC” button, it is any time possible to go back to the action and page preceding the “ENTER” button use.

Once inside the Sub-Menus pages, the several options can be scrolled and using the “PM2” or “PM3” encoders and selected/confirmed pushing the “ENTER” button.

Note: In every Sub-Menu the option currently selected/running will have an **asterisk “*”** showing to the right of the description on the LCD screen

Options that are not selected/running will be displayed with NO Asterisk.

Pushing the ENTER button on an unselected option will mean an asterisk will then appear and this option will now take over as the currently selected/running option.

System Utilities Sub-menu - this sub-menu allows to access several operations related to the DS-EQ230 Start Up and General Configuration:

**UTILITY MENU
- System Utilities -**

From the “System Utilities Sub-menu”, pushing “ENTER” and then using the “NAV/PM1” encoder for scrolling will give access to the following pages:

- **Power-On Procedure:** this gives you the ability to select the option that will apply when the DS-EQ230 powers up after being switched on:



By pressing ENTER and rotating the “PM2” or “PM3” encoder, it is possible to choose between two options: “Fade In On” or “Fade In Off”.
The currently running option will be displayed with an asterisk to the right of the option description. To change the option simply ENTER on the option not displaying the asterisk and that option will become active and an asterisk will now appear to the right of the option description.

The following two options are available:

FADE-In = Off ... when the DS-EQ230 is turned on, all Outputs regardless of their status before the Unit was switched off, will be MUTED or UNMUTED automatically. Meaning the DS-EQ230 will have no active Outputs or active Outputs, during the start-up process, depending from the Outputs’ previous status.

FADE-In = On ... when the DS-EQ230 is turned on, all Outputs not previously muted before the Unit was switched off will be active. Meaning the DS-EQ230 outputs will be controlled by a volume ramp to avoid any sudden sound.

If the option “Fade-In=On” is selected, the screen will show the following:



Delay Time/Distance: this page allows you to select the measurement unit to be used for the Delays: **Time** (in milliseconds “ms”) or **Distance** (in meters “m”):



By pressing ENTER and rotating the “PM2” or “PM3” encoder, it is possible to select the measurement unit to be used for the delay, which will be confirmed by pushing the ENTER button. The following screen shows the selected delay measurement is Time (milliseconds):



Ramps on changes: this page allows you to activate or de-activate Fading-in and Fading-out ramps on the input/output volumes when any parameter changes:



When connected to the DS-EQ230 by the PC remote control software, it is possible to request sudden parameter changes where the difference between the old parameter and the new one can cause unwanted “click” noises (big differences in volume changes) or “bumps” (big differences in Hp/lp filters cutting frequency values) as the DSP reconfigures. The Fading-In and Fading-Out ramps eliminate any potential clicks and bumps. This function can be de-activated when the unit needs to be used in “live” conditions and small parameter adjustments are requested “on the fly” during live performance. The following screen shows the Fading ramps function is Off, and therefore de-activated:



Software Version: this page allows you to confirm the Software Version running on the DS-EQ230:



Program Utilities Sub-menu - this sub-menu allows you to access several options related to the DS-EQ230 operating mode and to manage the presets stored and recallable within the Unit:



By pressing the ENTER button and then using the “NAV/PM1” encoder the following pages can be accessed:

Recall a Program: this page allows the Loading of a preset program.

The DS-EQ230 contains 8 Factory presets occupying the first 8 positions of the Preset list which setting is shown in the “A-Appendix”.

The 8 Factory presets are the following

1. Default Flat
2. Default Classic
3. Default Disco
4. Default Jazz
5. Default Pop
6. Default RnB
7. Default Rock
8. Default Vocal

You can store up to 24 presets in the DS-EQ230 memory starting from the location 09 up to the location 32.

Through the “Recall a Program” page, the Factory and the available user’s preset can be recalled for the DS-EQ230 filters’ setting:

PROGRAM UTILITY
- **Recall a Program** -

By pressing ENTER and rotating the “PM2” or “PM3” encoders, it is possible to scroll through all current available factory and user presets.

If NO USER PRESETS are stored yet, the screen will show ONLY the factory presets:

Recall a Program
01: Default Flat

If presets have previously been stored by the user, any one of them can be recalled starting from the location 09:

[ENTER] to Recall
09: PRESET1

By using the “PM2” or “PM3” encoder it is possible to scroll through the stored presets. Once the desired preset appears on the screen select it by pressing the “ENTER” button and this will force the DS-EQ230 to begin to load this selected preset and the following transitory screen will appear:

DS-EQ230
1x2 WAY X-OVER

Once loaded, the DS-EQ230 will exit to the “Recall a Program” screen automatically and the above screen will disappear:



Note: At any time it is possible to quit the recalling action by pressing the “ESC” button.

Save a Program: this page allows you to store a new preset in the DS-EQ230’s memory:



By pressing the ENTER button and rotating the “PM2” or “PM3” encoder, it is possible to scroll through the previously saved presets and the available empty locations (identified by “Empty Memory”).

If no user presets are stored, the “Save a Program” screen will show empty memory locations for all 09-32 presets as shown in the example below for location 10:



When storing an edited configuration for the DS-EQ230, select the location for a preset from the **24 available** by using the “PM2” or “PM3” encoders.

Once the desired location appears on the screen press ENTER again to reach the “**Set Program Name**” page.

In this page the User can enter a Preset Name (**up to 16 Characters**) by using the “PM2” or “PM3” encoder to choose a character and the “NAV/PM1” encoder to move between the 16 available locations for the character’s positioning.

The current position of the cursor is shown by a “blinking underscore”.

The following is an example of a screen while entering the preset name “Velvet Club” in location 10:



To store the Preset Name press the “ENTER” button again.
The above action will take you to the “**Enter to Save**” page showing the selected location for the preset and the final edited name:

[ENTER] to Save
10: Velvet Club ?

Pressing “ENTER” again, will store the preset in the selected location with the chosen name and the following transitory screen will appear on the LCD:

Saving to Memory
10: Velvet Club

Once the preset is stored, the above screen will disappear returning to the following screen:

PROGRAM UTILITY
- Save a Program -

If during the Preset Storing process you want to overwrite an existing memory location, select this location in the “**Save a Program**” page, then ENTER and you will be asked if you want to overwrite this preset with the following “[ENTER] to Overwrite” screen displaying the currently stored preset and location:

[ENTER] to Overwrite
10: Velvet Club ?

If you wish to proceed press “ENTER” again and the DS-EQ230 will go ahead with the “**Set Program Name**” page and the subsequent overwrite on completion of the previously described storing process.

Note: At any time it is possible to quit the storing action by pressing the “ESC” button.

Delete a Program: this page allows you to delete a preset already stored in the DS-EQ230 memory:

PROGRAM UTILITY
- Delete a Program -

By pressing the ENTER button and rotating the “PM2” or “PM3” encoder, it is possible to scroll through the previously saved presets and the available empty locations (identified by “Empty Memory”).

If no user presets are stored, the “Delete a Program” screen will show empty memory locations for all 1-24 presets as shown in the example below for location 10:

Delete a Program
10: Empty Memory

If Presets are available they will be shown in the “Delete a Program” page as follows:

Delete a Program
10: Velvet Club

By using the “PM2” or “PM3” encoder it is possible to select a preset to be deleted. Pressing the “ENTER” button on a selected preset will bring up the “[Enter] to Delete” page showing the selected preset.

For example, if we want to delete the preset 10, “Velvet Club”, the screen will be the following:

[ENTER] to Delete
10: Velvet Club

Confirming the deletion by pressing “ENTER” again, will force the DS-EQ230 to erase the selected preset and the following transitory screen will appear:

Deleting Program
10: Velvet Club

Once the preset is deleted, the above screen will disappear returning to the following screen:

PROGRAM UTILITY
- Delete a Program -

Note: At any time it is possible to quit the deleting action by pressing the “ESC” button.

Interface Utilities Sub-menu - this sub-menu allows you to define the remote control interface [USB or RS485] to be used for controlling the DS-EQ230 :



From “Interface Utilities”, press “ENTER” to access the Interface Setup.

Interface Setup: this screen allows you to choose the remote control protocol for the DS-EQ230.



By pressing “ENTER” and then using the PM2 or PM3 encoders, you can choose between the two possible interfaces (USB or RS485) for the DS-EQ230.

Pressing ENTER on a selected source will make an asterisk appear to the right of the description on the LCD as in the following example which shows the selected interface as USB.



Security Sub-menu - this sub-menu allows the User to set the parameters shown, lock the DS-EQ230 and set a Password, therefore limiting the unit's functions and controls to those who have only access to the appropriate Password.

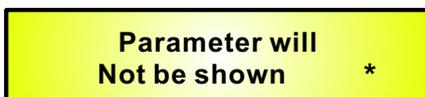


Press ENTER and then use the “NAV/PM1” to scroll between options.

Show Parameter: Pressing ENTER from the above menu will access the “Show Parameter” Sub Menu.



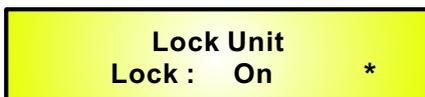
Press ENTER again and use the “PM2” or “PM3” encoders to scroll between the “be shown” and “not be shown” options. An asterisk will highlight which option is selected. Choosing the “be shown” option means that once the unit is locked, you cannot access parameter editing features, but they will be displayed on the LCD screen. Choosing the “not be shown” option means that once the unit is locked, the parameters will not be shown at all. With this option, when trying to access a parameter, the following screen message will appear:



Lock Unit: this sub-menu allows the user to lock the device so no parameters can be edited or modified.



When the Unit is in an unlocked condition, all parameters will be available for editing. When you select On, all parameters will be locked and are not available for editing.

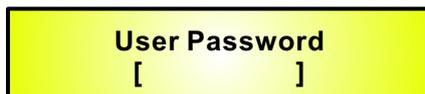


When you select lock from the menu, the unit will be locked and the lock menu automatically exited. The screen will revert to the “Default” showing the current Equalizer’s preset selected and beside the preset’s name a “keylock” icon indicating that the DS-EQ230 is locked.

User Password: from the “User Password” sub-menu:



Press “ENTER” to access the “**User Password**” page:



Using the “PM2” or “PM3” encoders to choose a character and the “NAV/PM1” encoder to move between available locations you can enter a **6 Character** Password Name. The current position of the cursor for the characters to be entered is shown by a “blinking underscore”.

During this editing phase, the display is as follows if we were using “DSPOT1” as the password:



The DS-EQ230 will exit the “Unit Lock” sub-menu and jump to the “User Password” sub-menu page screen.



If the password entered in the “Confirm Password” page matches the one entered in the “Enter Password” page, the following screen will appear:



The Password is now configured and held in the device’s memory.

The user can now decide to “lock” the DS-EQ230 by Password, inhibiting the access to ALL Equalizer’s functions depending on the setting of the parameter “Password Enable/Disable”, explained in the following paragraph.

- **Menu “LIN/RIN” Equalizer’s Channels Editing [access by pushing the “LIN/RIN” buttons]**

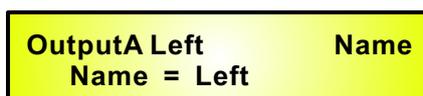
From the “Default Screen”, it is possible to access the “LIN/RIN” editing menu by pushing the “LIN” or “RIN” button. Once the button is pressed, the related blue “EDIT” LED will turn ON. The Sub-Menu pages can now be scrolled through by rotating clockwise and counter-clockwise the “NAV/PM1” encoder.

For parameter editing, it is necessary to press ENTER and an arrow will appear on the left of the screen “->”. Then use the “PM2” and “PM3” encoders for selecting and setting the parameter values. On some parameters that have three independent values, you will also need to use the PM1 encoder, eg filter parameter settings.

Note: All parameter editing can be done using the “NAV/PM1”, “PM2”, and “PM3” encoders and the current shown value of the selected option is AUTOMATICALLY loaded during the encoders’ use and stored as the current value once leaving the page.

Name page - from this screen it is possible to assign a **6 character** name to the Equalizer’s Channel.

The following is an example screen for a “Name” page labeled “Left” for the Equalizer’s Channel LIN [A]:



```
OutputA Left      Name
Name = Left
```

To Edit press ENTER on the Name Page and the entering arrow will appear as in the example below:

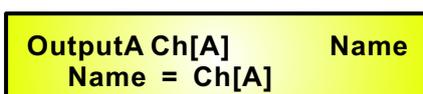


```
OutputA Left      Name
->Name = Left
```

The first letter position will be blinking.

Select the Character position from the 6 available by rotating the “NAV/PM1” encoder, then by using the “PM2” or “PM3” encoder it is possible to select the desired character.

Once you are happy with your name selection, press “ENTER” to confirm the edited Name. The New name will be stored. The following example shows “Ch[A]” replacing our previous name of “Left”:

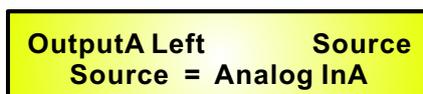


```
OutputA Ch[A]    Name
Name = Ch[A]
```

Source page - from this page it is possible to assign one of the following Inputs to any Equalizer's Channel:

1. Analog InA = Input Channel A
2. Analog InB = Input Channel B
3. Analog InA+B = Sum of Input Channel A and Input Channel B
4. Digital Left = Input S/PDIF Channel Left
5. Digital Right = Input S/PDIF Channel Right
6. Digital L+R = Sum of Input S/PDIF Channel Left and Input S/PDIF Channel Right

The following is an example screen for the "Source" where Analog Input A is assigned to Equalizer's Channel A (named Left):

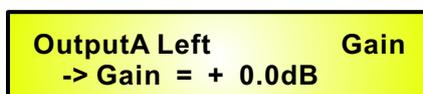


OutputA Left Source
Source = Analog InA

After pressing ENTER, an arrow will appear on the left of the screen "->". The Input can be selected by rotating either the "PM2" or "PM3" encoders.

Gain page - from this screen it is possible to set the Equalizer's Channels Level from -12dB to +6dB. Press ENTER and an arrow will appear on the left of the screen "->", then use the "PM1" or "PM2" buttons.

The value set on this screen will only affect the input level of the selected Equalizer's Channel LIN/RIN. The following is an example screen for the "Gain" page where the Gain of the Equalizer's Channel A (named Left) is set to +0.0dB:



OutputA Left Gain
-> Gain = + 0.0dB

Polarity page - from this page it is possible to set the Equalizer's Channel Polarity, by using the "PM1" or "PM2" encoders.

The polarity can be "Normal" or "Inverted" (which means rotated of 180 Degrees).

The following is an example of a "Polarity" screen where the Polarity of the Equalizer's Channel A (named Left) is set to "Normal":



OutputA Left Polarity
-> Polarity = Normal

Delay page - from this page it is possible to set the Equalizer's Channels Delay Time from 000.000mS up to 848.9984mS, by steps of 1mS or 20.8uS.

To set the Delay time press ENTER an arrow will appear on the left of the screen "->". Then use the "PM2" encoder to set the Delay Time in steps of 1mS and the "PM3", for setting the "fine" Delay Time in steps of 20.8 microseconds.

The following is an example screen for the "Delay" page where the Delay Time of Equalizer's Channel A (named Left) is set to 160.1872mS:

OutputA Left	Delay
-> Delay = 160.1872mS	

HPF sub-menu - from this sub-menu it is possible to set the Equalizer's Channels High Pass Filter (HPF).

The following is an example of a HPF sub-menu screen with the filter set at 24dB Linkwitz/Riley on Equalizer's Channel A (named Left):

OutputA Left	HPF
-> 20.0 Hz Lnk/Ril	24dB

The filter's parameters can be modified by use the "PM2" and "PM3" encoders for editing the Filter's Low Cut Frequency and the Filter's Type and Order.

The Low Cut Frequency of the High Pass Filter can be edited using the "PM2" encoder and the Filter's Type and Order can be edited by using the "PM3" encoder.

"Low Cut Frequency": the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave and can be adjusted by rotating the "PM2" encoder.

"High Pass Type and Order": allows you to select the Equalizer's High Pass Filter Shape and Order.

The available shapes and orders for the High Pass Filter, that are accessible by rotating the "PM3" encoder, are listed below:

- No Cut-Off (High Pass Filter Bypassed)
- Butwrth 6dB (Butterworth Filter 6dB/Oct Slope)
- Butwrth 12dB (Butterworth Filter 12dB/Oct Slope)
- Lnk/Ril 12dB (Linkwitz/Riley Filter 12dB/Oct Slope)
- Bessel 12dB (Bessel Filter 12dB/Oct Slope)
- Butwrth 18dB (Butterworth Filter 18dB/Oct Slope)
- Butwrth 24dB (Butterworth Filter 24dB/Oct Slope)
- Lnk/Ril 24dB (Linkwitz/Riley Filter 24dB/Oct Slope)
- Bessel 24dB (Bessel Filter 24dB/Oct Slope)

Note1: Once the desired options have been selected using the 2 encoders, they are automatically saved as current and stored in the DS-EQ230 system status once leaving the page.

Note2: To exit this page, push the "ESC" button.

LPF sub-menu - from this sub-menu it is possible to set the Equalizer's Channels Low Pass Filter (LPF).

The following is an example of a LPF sub-menu screen with the filter set at 24dB Linkwitz/Riley on Equalizer's Channel A (named Left):

OutputA Left	LPF
-> 20.0Hz Lnk/Ril	24dB

The filter's parameters can be modified by use the "PM2" and "PM3" encoders for editing the Filter's High Cut Frequency and the Filter's Type and Order.

The High Cut Frequency of the Low Pass Filter can be edited using the "PM2" encoder and the Filter's Type and Order can be edited by using the "PM3" encoder.

"High Cut Frequency": the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave and can be adjusted by rotating the "PM2" encoder.

"Low Pass Type and Order": this page allows you to select the Equalizer's Low Pass Filter Shape and Order.

The available shapes and orders for the Low Pass Filter that are accessible by rotating the "PM3" encoder are listed below:

- No Cut-Off (Low Pass Filter Bypassed)
- Butwrth 6dB (Butterworth Filter 6dB/Oct Slope)
- Butwrth 12dB (Butterworth Filter 12dB/Oct Slope)
- Lnk/Ril 12dB (Linkwitz/Riley Filter 12dB/Oct Slope)
- Bessel 12dB (Bessel Filter 12dB/Oct Slope)
- Butwrth 18dB (Butterworth Filter 18dB/Oct Slope)
- Butwrth 24dB (Butterworth Filter 24dB/Oct Slope)
- Lnk/Ril 24dB (Linkwitz/Riley Filter 24dB/Oct Slope)
- Bessel 24dB (Bessel Filter 24dB/Oct Slope)

Note1: Once the desired options have been selected using the 2 encoders, they are automatically saved as current and stored in the DS-EQ230 system status once leaving the page.

Note2: To exit this page, push the "ESC" button.

EQ: [x] sub-menu - from this sub-menu it is possible to set the Equalizer's Channels 30 available Parametric or Shelving Filters.

OutputA Left	EQ-X
1.00KHz BW1.05	0.0dB

The DS-EQ230 allows the user to select either Bell or Shelving Parameters and assign them independently using the 30 available filters.

In order to select the filter's type, it is necessary to have the filter's GAIN=0.0dB, then using the "PM2" encoder, rotate it "clockwise" in order to decide the Bell filter's Bandwidth, or "counter-clockwise" to select the Shelving filter type (Low or High) and its order (1st or 2nd). So, in order to define the filter type for the filter number 1 ("x"=1), it is necessary from the above Screen, to enter the filter's editing page pressing the ENTER button, and the screen has to appear as follows:

OutputA Left	EQ-1
-> 1.00KHz BW1.05 0.0dB	

In this case, the filter's GAIN=0.0dB, and being BW=1.05, the current filter selected is a Bell type. Now, rotating the "PM2" encoder clockwise, the parameter BW will range from 0.05 up to 3 for identifying a bandwidth value for a Bell filter.

If a Bell filter is selected, then the Gain can be modified from 0.0dB and the BW will range between 0.05 and 3.

If the user wants to select a Shelving filter from the above setting, with the GAIN=0.0dB [if the GAIN is not 0.0dB, it is necessary to set it at 0.0dB using the "PM3" encoder], rotate the "PM2" Counter-clockwise. Once BW reaches the 0.05 value, at the next step of the "PM2" counter-clockwise rotation, the selection of the Shelving filters will be entered.

Still rotating the "PM2" counter-clockwise, the Shelving filters and their order will be selectable in the following sequence:

1. 1st Order Low Shelving = -6LoSh [on the screen]
2. 2nd Order Low Shelving = -12LoSh [on the screen]
3. 1st Order High Shelving = -6HiSh [on the screen]
4. 2nd Order High Shelving = -12HiSh [on the screen]

Once the desired Shelving filter is selected, the "PM3" can then be used to select the desired GAIN and when the GAIN is set at a value different from 0.0dB, then the filter type cannot be changed until this GAIN is returned to 0.0dB.

BELL Filter: As an example, if we want to set a bell filter within EQ-1, then the BW has to be set At a desired value of say 1.00 using the "PM2" encoder, the GAIN at say +3dB using the "PM3" encoder and the center Frequency at say 1.00KHz with the "NAV/PM1" encoder. The EQ sub-menu screen will show the following:

OutputA Left	EQ-1
-> 1.00KHz BW1.00 + 3.0dB	

Once in the Bell Filter's edit screen all the filter's parameters can be modified using the "NAV/PM1", "PM2" and "PM3" encoders for editing the Filter's Center Frequency, Bandwidth BW and Gain.

The Center Frequency of the Parametric Filter can be edited using the "NAV/PM1" encoder, the BW the "PM2" encoder and the Gain the "PM3" encoder:

"Center Frequency": the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave and can be adjusted by rotating the "NAV/PM1" encoder.

"Bandwidth BW": the selectable BW range is from 0.05 Octave to 3 Octave in steps of 0.05 Octave and can be adjusted by rotating the "PM2" encoder.

"Gain": the selectable Gain range is from -15dB to +15dB in steps of 0.5 dB and can be adjusted by rotating the "PM3" encoder.

Low Shelving Filter: As an example if we want to set a low shelving filter within EQ-1 then the "PM2" encoder has to be rotated counter-clockwise until the desired Low Shelving filter say -6LoSh appears on the screen, the GAIN at say +3.0dB using the "PM3" encoder and the High Cut Frequency at say 1.00KHz with the "NAV/PM1" encoder.

The EQ sub-menu screen will show the following:

OutputA Left	EQ-1
-> 1.00KHz -6LoSh + 3.0dB	

Note: Once the desired Low Shelving filter is selected, the "PM3" can then be used to select the desired GAIN and when the GAIN is set at a value different from 0.0dB, then the filter type cannot be changed until this GAIN is returned to 0.0dB.

Once in the Low Shelving Filter's edit screen all the filter's parameters can be modified using the "NAV/PM1", "PM2" and "PM3" encoders for editing the Filter's High Cut Frequency, Filter's Order and Gain.

The Hi Cut Frequency of the Low Shelving Filter can be edited using the "NAV/PM1" encoder, the Filter's Order can be adjusted by the "PM2" encoder and the Gain the "PM3" encoder:

"Hi Cut Frequency": the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave and can be adjusted by rotating the "NAV/PM1" encoder.

"Low Shelving Order": the selectable Low Shelving Filter's range can be selected between the 1st (Lo-1st.) and the 2nd (Lo-2nd.) one.

"Gain": the selectable range of the Gain is from -15dB to +15dB in steps of 0.5 dB and can be adjusted by rotating the "PM3" encoder.

High Shelving Filter: As an example if we want to set a high shelving filter within EQ-1 then the "PM2" encoder has to be rotated counter-clockwise until the desired High Shelving filter say -6HiSh appears on the screen, the GAIN at say +3dB using the "PM3" encoder and the Low Cut Frequency at say 1.00KHz with the "NAV/PM1" encoder.

OutputA Left	EQ-1
-> 1.00KHz -6HiSh + 3.0dB	

Note: Once the desired High Shelving filter is selected, the “PM3” can then be used to select the desired GAIN and when the GAIN is set at a value different from 0.0dB, then the filter type cannot be changed until this GAIN is returned to 0.0dB.

Once in the High Shelving Filter’s edit screen all the filter’s parameters can be modified using the “NAV/PM1”, “PM2” and “PM3” encoders for editing the Filter’s Low Cut Frequency, Filter’s Order and Gain.

The Lo Cut Frequency of the High Shelving Filter can be edited using the “NAV/PM1” encoder, the Filter’s Order can be adjusted by the “PM2” encoder and the Gain the “PM3” encoder:

“Lo Cut Frequency”: the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave and can be adjusted by rotating the “NAV/PM1” encoder.

“High Shelving Order”: the selectable High Shelving Filter’s range can be selected between the 1st (Lo-1st.) and the 2nd (Lo-2nd.) one.

“Gain”: the selectable range of the Gain is from -15dB to +15dB in steps of 0.5 dB and can be adjusted by rotating the “PM3” encoder.

Note1: Once the desired options have been selected using the 3 encoders, they are automatically saved as current and stored in the DS-EQ230 system status once leaving the page.

Note2: To exit this page, push the “ESC” button.

Volume page - from this screen it is possible to set the Equalizer’s Channels Output Level from -12dB to +6dB, press ENTER an arrow will appear on the left of the screen “->” then use the “PM1” or “PM2” buttons.

The value set on this screen will only affect the output level of the selected Equalizer’s Channel. The following is an example screen for the “Volume” page where the Gain of the Equalizer’s Channel A (named Left) is set to +0.0dB.

OutputA Left	Volume
-> Volume = + 0.0dB	

• **MENU “A and B Output Channels Compressor/Limiter” [Access by pushing the “LCOMP/RCOMP” buttons]**

From the “Default Screen”, it is possible to access the “Equalizer’s Compressor” menu by pressing the “LCOMP” or “RCOMP” button. Once pressed, the related blue “EDIT” LED will turn ON. The Sub-Menus pages can now be scrolled through by rotating clockwise and counter-clockwise the “NAV/PM1” encoder.

For parameter editing it is necessary to press ENTER and an arrow will appear on the left of the screen “->”. Then use the “PM2” and “PM3” encoders for selecting and setting the parameter values. On some parameters that have three independent values, you will also need to use the “NAV/PM1” encoder, for example for the filter’s parameter setting.

Note: All parameter editing can be done using the “NAV/PM1”, “PM2”, and “PM3” encoders and the current shown value of the selected option is AUTOMATICALLY loaded during the encoders’ use and stored as the current value once leaving the page.

Limiter sub-menu - from this page it is possible to set the Equalizer’s Channels Limiter. The following is an example screen for the Limiter page where the Attack Time of the Limiter is set at 5ms, the Release Time is set at 0.2sec and the Limiter Active Threshold is set at +5dB:

OutputA Left	Limiter
A: 5ms R: 0.2s	+5.0dB

Upon pushing ENTER, the Limiter’s parameters can be modified using the “NAV/PM1”, “PM2” and “PM3” encoders for editing the Limiter’s Attack Time [A], Release Time [R] and Active Threshold.

Upon pushing ENTER, the above screen will change as follows:

OutputA Left	Limiter
-> A: 5ms R: 0.2s	+5.0dB

The Attack Time [A] can be edited using the “NAV/PM1” encoder, the Release Time [R] the “PM2” encoder and the Limiter Active Threshold the “PM3” encoder.

“Attack Time [A]”: the selectable range of the Limiter’s Attack Time is from 5ms to 200ms in steps of 1ms - from 5ms to 20ms, 5ms - from 20ms to 30ms, 10ms - from 30ms to 100ms and 20ms - from 100ms to 200ms.

The Limiter’s Attack Time can be adjusted by rotating the “NAV/PM1” encoder.

“Release Time [R]”: the selectable range of the Limiter’s Release Time is from 0.1s to 3s in steps of 0.1s and can be adjusted by rotating the “PM2” encoder.

“Limiter Active Threshold”: the selectable range of the Limiter’s Threshold is from +20dB (Limiter not active) to -10.0dB in steps of 0.2 dB and can be adjusted by rotating the “PM3” encoder.

Note1: Once the desired options have been selected using the 3 encoders, they are automatically saved as current and stored in the DS-EQ230 system status once leaving the page.

Note2: To exit this page, push the “ESC” button.

Note3: The LED meters on top of the LCOMP and RCOMP buttons are indicating the Limiter’s activity, showing from top to down the output signal limitation in dBu.

• **MENU “A and B Output Channels Utilities” [Access by pushing the “LOUT/ROUT” buttons]**

From the “Default Screen”, it is possible to access the “Equalizer’s Channel Utilities” menu by pressing the “LOUT” or “ROUT” button. Once pressed, the related blue “EDIT” LED will turn ON. The Sub-Menus pages can now be scrolled through by rotating clockwise and counter-clockwise the “NAV/PM1” encoder.

The available utilities are the following:

- 1.Flat Equalizer
- 2.Copy Equalizer from Ch[x]
- 3.Set Equalizer as graphic mode

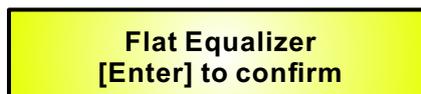
The previous utilities can be just confirmed by ENTER and automatically the related process will take place after a confirmation request.

Flat Equalizer - this utility is allowing to clear the all filters of the related Equalizer’s Channel. If selected the Equalizer’s Channel A (named Left), the screen will be the following:



OutputA Left
Flat Equalizer

Upon pushing ENTER, the DS-EQ230 will ask the confirmation before to clear the all filters.



Flat Equalizer
[Enter] to confirm

Pushing ENTER again, the DS-EQ230 will clear the all filters.

Copy Equalizer from ChX - this utility is allowing to on the currently selected Equalizer’s Channel, the complete setting of the other one.

When selecting the Equalizer’s Channel A (named Left), the screen will be the following:

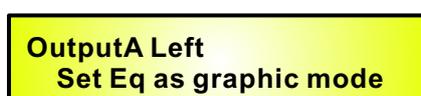


OutputA Left
Copy Equalizer from ChB

Upon pushing ENTER, the DS-EQ230 will ask the confirmation before to copy on the ChA the complete ChB setting.

Set Equalizer as graphic mode - this utility is allowing to set the center frequencies of the all filters of the related Equalizer’s Channel spaced by 1/3 of octave, as 30bands Graphic Equalizers.

When selecting the Equalizer’s Channel A (named Left), the screen will be the following:



OutputA Left
Set Eq as graphic mode

Upon pushing ENTER, the DS-EQ230 will ask the confirmation before to set the center frequencies of the all filters of the related Equalizer’s Channel spaced by 1/3 of octave.

• Factory Reset

In the event of the password being lost or any other reason, the user may require the unit to be Reset to the original factory settings. A “Factory Reset” that will clear all settings of the DS-EQ230 and return the device to the original factory setting, is available to the user.

Note: Continuing with this process will mean the DS-EQ230 will re-initialize to the original factory settings and any previously stored information and changed parameters will be permanently lost.

Use the following procedure to perform the factory reset:

1. While the DS-EQ230 is switched OFF, simultaneously press the ENTER+ESC+UTILITY buttons on the front panel.
2. Maintain pressure on all three buttons as you turn the power switch to On and the following LCD screen appears on the DS-EQ230:



**Please Wait
Memory Reset**

3. Release the buttons and wait for the DS-EQ230 to re-initialize.

Once completed, the DS-EQ230 will resume regular operation as though it was a new unit from the factory and no previously programmed parameters will be available for use.

• GND and USB/RS485 LIFT Switches

The DS-EQ230 on its back panel is providing a couple of switches allowing to connect or left Unconnected the power Supply Main GND and the USB/RS485 connectors GND to the chassis.

MAIN “LIFT/GND” Switch - At some times, it is necessary to NOT connect the Main Ground to the Chassis in order to avoid GND loops.

This is possible using the “MAIN” GND/LIFT switch.

When the switch is positioned on GND, the Main Power Supply GND is connected to the Chassis.

USB/RS485 “LIFT/GND” Switch - When using a USB or RS485 remote control connection, it can be that the GND of the USB or RS485 cable it is not connected to the remote controller GND.

In this case it is necessary to provide it from the processor’s side, and this can be done selecting the GND position with the USB/RS485 switch.

On the other hand, if the GND of the USB/RS485 cable is already connected to the remote controller GND, to connect the same ground also to the GND of the processor could create GND loops or generate GND noises.

In this case, the switch on the position “Lift” will leave the cable GND not connected to the chassis of the DS-EQ230.

• Equalizer's Channels LIN/RIN and Compressor/Limiter's Channels LCOMP/RCOMP Last Edited Parameter Return Function

Once you have escaped out of parameter editing within the individual Equalizer's Channel or Compressor's Channel the DS-EQ230 will remember this last editing action on that Channel. When you return for your next editing action pressing the EDIT button on that channel will immediately return you to the screen related to this last editing action.

This function makes fine tuning or modifying easier when it is necessary to make a number of adjustments to the same parameter in a short time sequence.

• Equalizer's Channels and Compressor/Limiter's Channels LINK Function

The DS-EQ230 is able to perform a unique LINK MODE between Equalizer's Channels as well as a link between Compressor's Channels to enable quick and immediate editing (you cannot link Equalizer's to Compressor's channels).

To link channels when editing, you will need to select a "Master" channel that will be the one to be edited and have its parameters displayed on the LCD screen. You can then select and link the other channel (Slave) that you wish to apply the same changes to.

To enter a link mode session, select the Master channel Edit mode, then link the Slave by pressing their related Edit buttons.

Once Linked, the channels will be selected ready for adjustment when their "Blue" LED is lit in the Editing mode.

Now the Slave channel will modify its parameters accordingly as you edit the Master channel.

All other existing parameters will stay the same within the Slave Channel unless edited by this link with the Master channel.

Note: The LINK function is NOT a COPY function.

If we want to edit the Limiter of the Equalizer's Channel A (named Left), we can enter the editing mode of Compressor's Channel A by pressing the related LCOMP Edit button and turning on the Blue LED below the LCOMP LED meters. This assigns the "role" of Master and displays this Channel's parameters on the LCD:

OutputA Left	Limiter
A: 5ms R: 0.2s	+5.0dB

Then press the Edit button of Compressor's Channel B, turning ON its related "Blue" LED's. Now All parameters edited on Compressor's Channel A, will also be applied to channel B.

If we want to remove the linked channel from the Link, press the related Edit button.

Exiting the editing of the Master channel during a Link session will automatically terminate that session. The Link will also be automatically terminated if, during the editing of Compressor's Channels you jump across to begin editing an Equalizer's Channel or vice versa.

Using the DS-EQ230 Software.

- Load the Software “SetupDS-EQ230V1.0.0” either with the included CD or via the Galaxy Website.
- Double click on “Setup”, choose “Run” the software will load.
- Go to programs and double click on DS-EQ230V1.0.0
- Connect the SDS-EQ230 with the USB cable to your computer.
- Turn on the DS-EQ230, the driver software will load automatically.
- When the driver has finished loading, click once on “connect”.



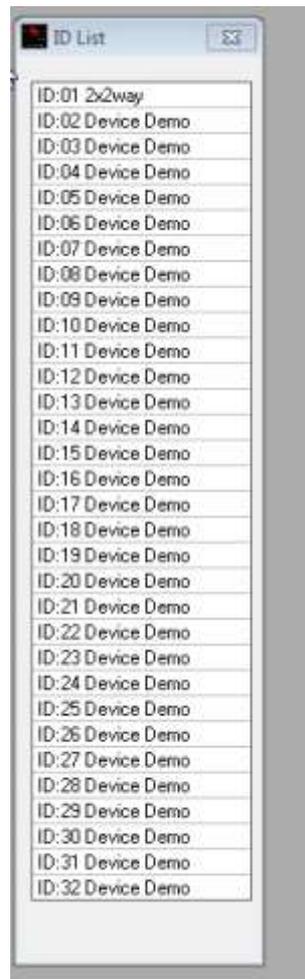
If you want to continue select “Yes”



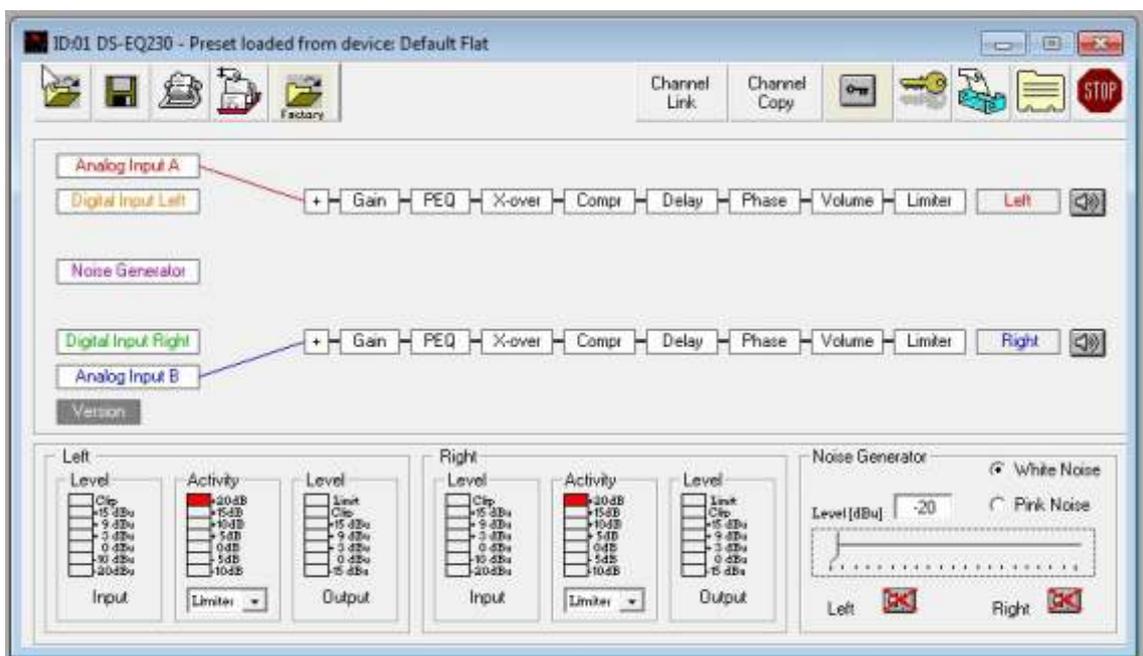
Choose your connection type.
Then Click on Connect.



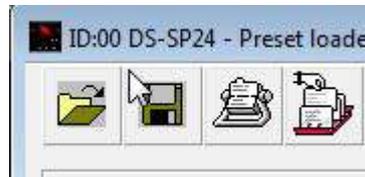
The software will look for active devices and show them in a list.
To edit Double click on the desired device in the ID list.



The Main Page will load.



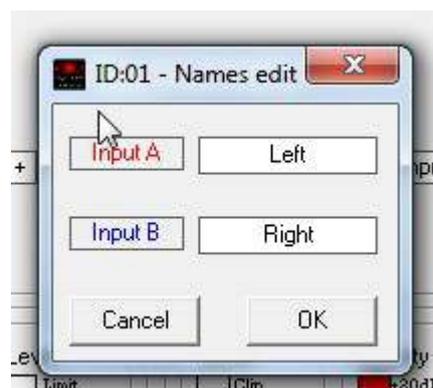
The device will also be locked out from front panel control at this point.
You may choose to “Load Preset from PC”, “Save Preset to PC”, “Store Preset to Device”, “Read Preset from Device”



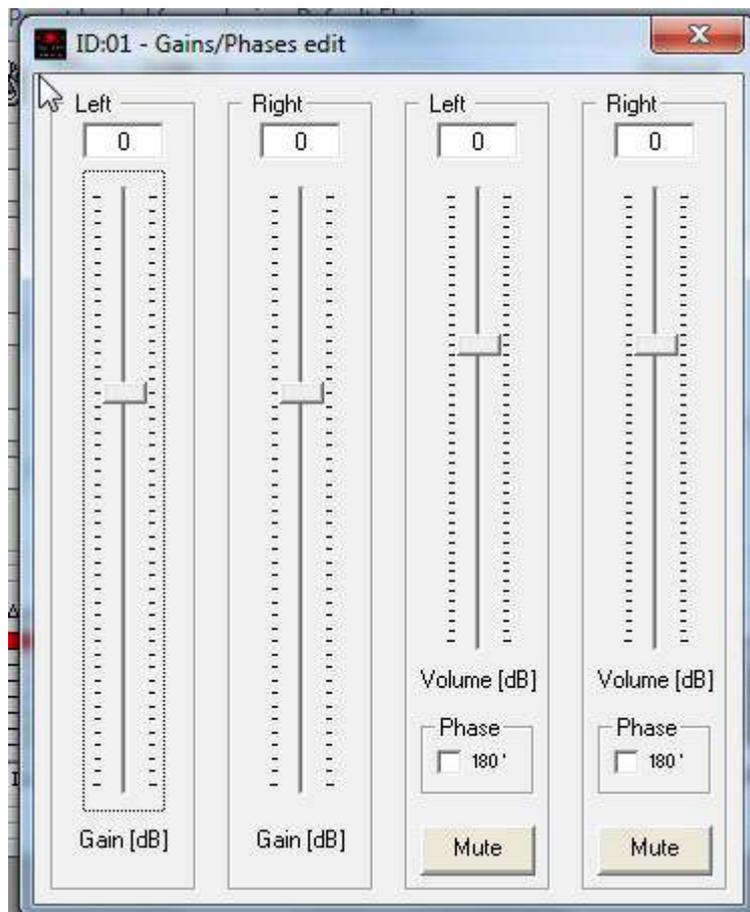
You can name a device by selecting edit device name.



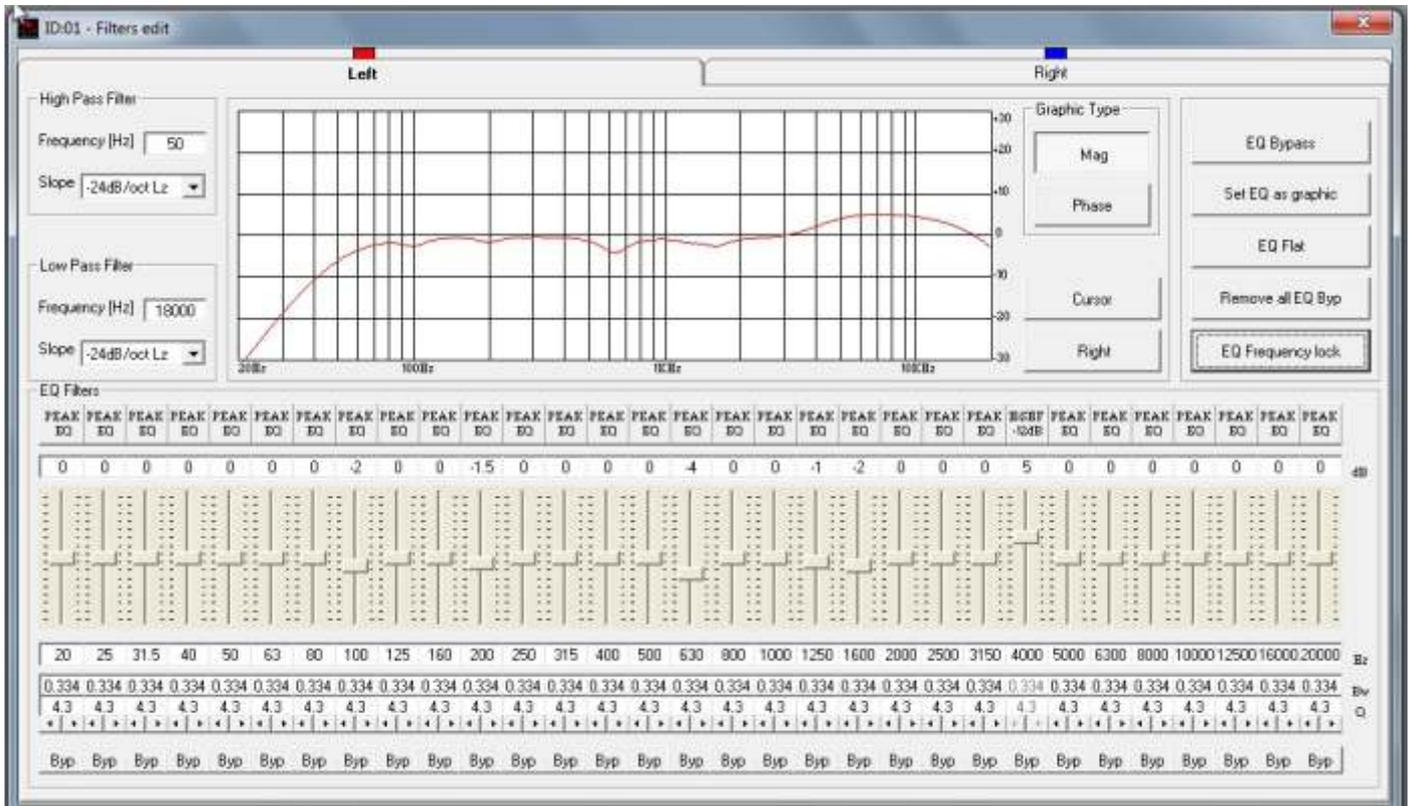
From the main page you can choose the section you want to adjust by clicking on the associated block.
Once you have accessed the block you can adjust parameters by either using the sliders, arrows, or typing the values in directly.
Select the input block to access input and output naming.



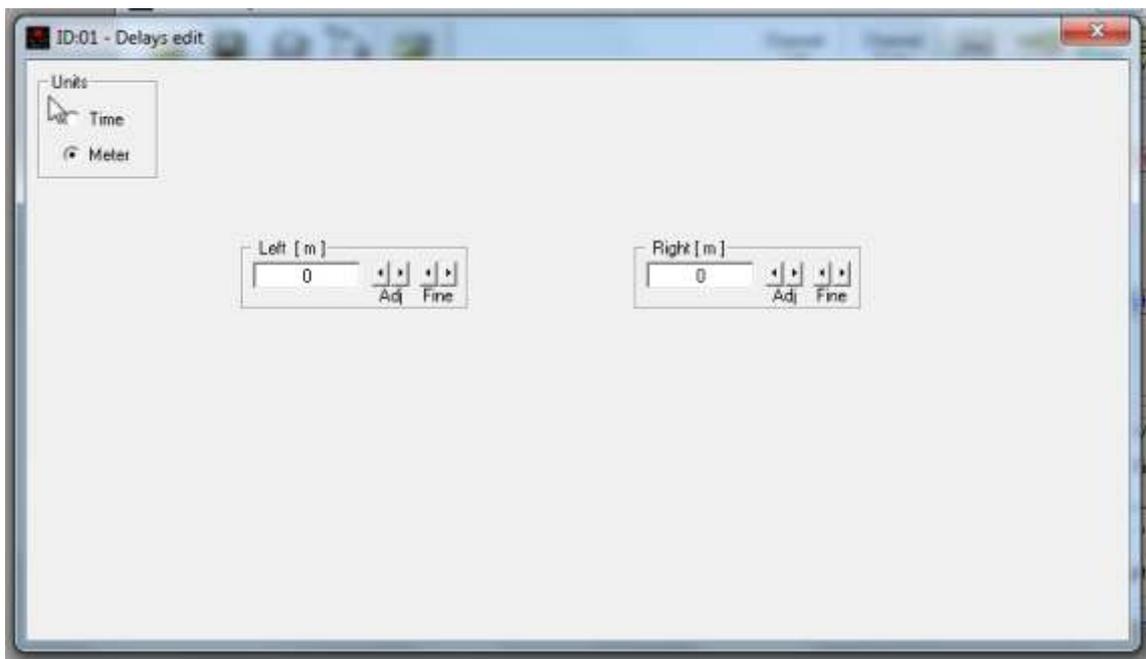
Select the gain block to access the gain and polarity of the inputs and outputs.



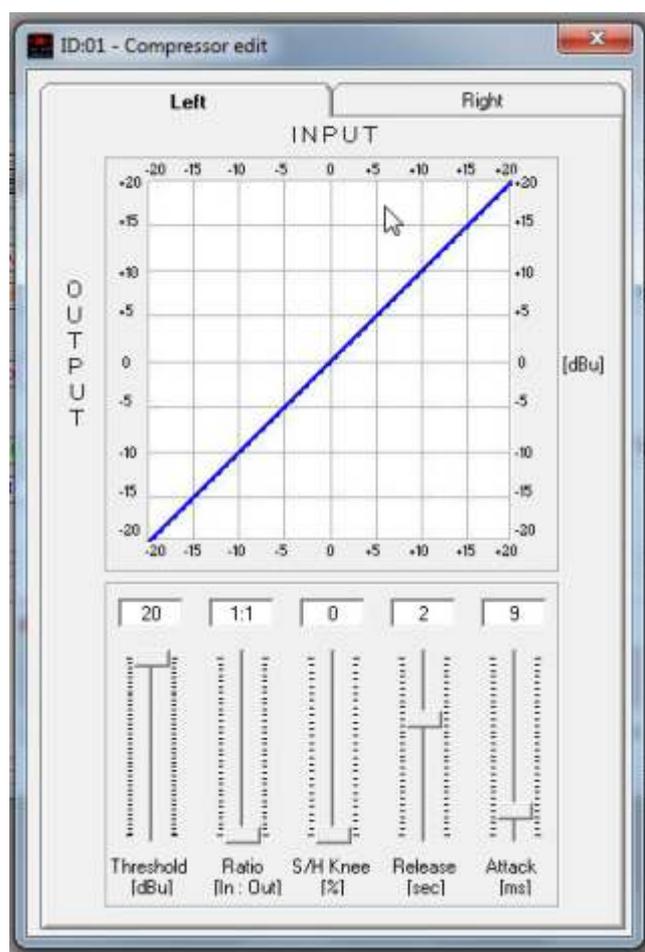
Select the PEQ block to access the input and output filters.



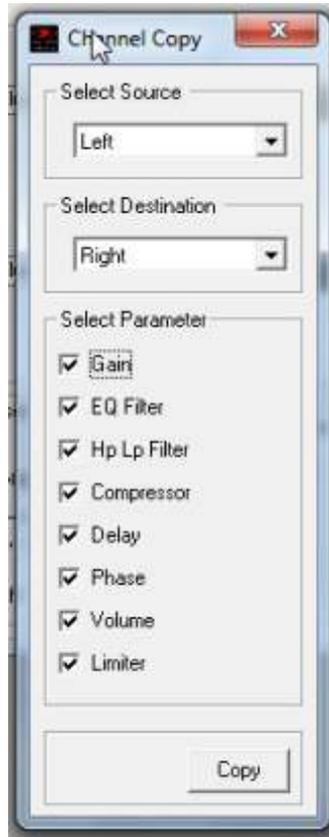
Select the Delay block to access the input and output delays.



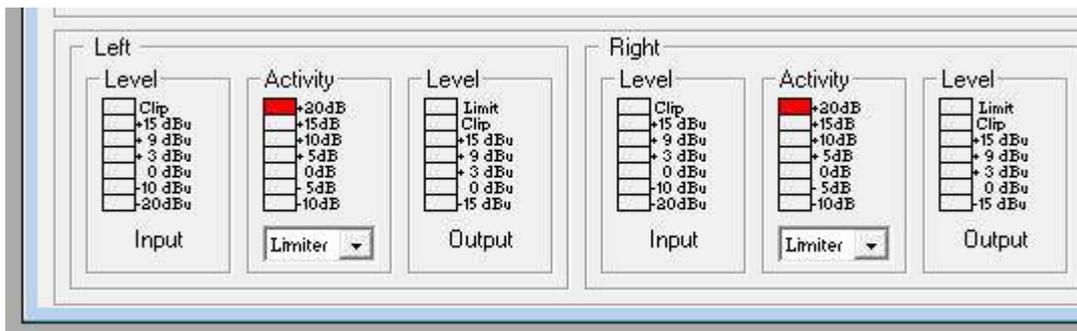
Select the Limiter Block to access the Limiter page.



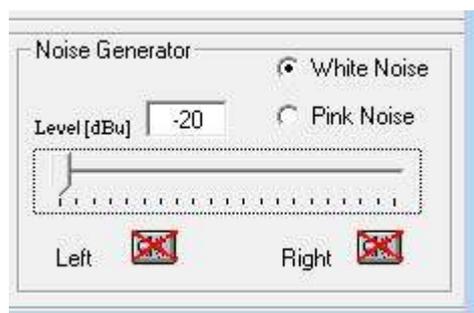
You can copy parameters between channels by selecting the copy input or copy output block and then selecting the source parameters and the destination.



You can select the meters to show either, level or limiter function.



You can select and edit the noise generator functions.



Volume Control Tables

• USB/RS485 Remote Control protocol for Preset Changing and Gain/Volume controls

The following is the HEX Code for controlling the DS-EQ230 recall presets and master volume Control:

Preset Changing:

CMD_RECALL_PRESET: CMD=18H

A. The User has to send the following Command, including the number of the preset to load on the unit:

TX:

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	C1H	XX	1BH	NPreset	00H	F7H						

The DS-EQ230's microcontroller will check if the Preset is initialized (available or not yet created..)

B. If YES, then the microcontroller will send back to the User (eg Crestron/AMX Remote Control) the same frame used by the command

XX= 0,....,31 (ID device)

Npreset=0,....,31 Presetnumber

RX:

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	C1H	XX	1BH	NPreset	00H	F7H						

So in this case, if the user gets back EXACTLY what was sent, the preset is existing and loaded on the unit.

C. If the preset that the user wanted to load is NOT YET INITIALIZED (not yet created, so not Available..), the microcontroller will notify that to the user, sending back the following frame:

RX:

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	C1H	XX	1BH	NPreset	00H	F7H						

Input Gain and Output Volume Control:

UPDATE GAINS-PHASE: CMD=01H

A. The User has to send the following Command, including the value to be assigned to "Vol", for Modifying the Input Gain (Chn =: 0, 1) or the Output Volume (Chn =: 2, 3). Also the Output signal Phase can be modified:

TX:

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	C1H	XX	01H	Chn	00H	00H	00H	00H	00H	Phs	Vol	F7H

xx = 0, ..., 31 (ID device)

Chn=0, ..., 3: Channel selected, 0, 1=In1, In2; 2, 3=Out1, Out2; when Channel 0, 1 selected, then Vol=Input

Gain, when Channel 2, 3 selected, then Vol= Output Vol.

Pha= Phase only if the Chn>1; Value=0, 1 where 0=direct, 1=inverse (180')

Vol= Gains from 0 to 180 (-12dB/ +6dB step 0.1dB)

B. If the command has been properly executed and the Gain/Volume modified, then the Microcontroller will send back to the User (eg Crestron/AMX Remote Control..) the same frame used by the command:

RX:

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	C1H	XX	01H	Chn	00H	00H	00H	00H	00H	Phs	Vol	F7H

Specifications

• DS-EQ230 Technical Specifications



The DS-EQ230 Digital Graphic/Parametric Equalizer is based on a powerful analog and digital DSP platform having the following specifications

Analog Input Signal: LIN/RIN Bal. Female XLR
Maximum Input Level: +20dBu
Analog Output Signal: LOUT/ROUT Bal. Male XLR
Maximum Output Level: +20dBu

Digital Processing (DSP): SAM3716, 24bits (data) x 96 bits (coeff.)
A/D Converters: AKM5392, 24bits
D/A Converters: AKM4396, 24bits
Sampling Frequency: 48kKz
S/PDIF Stereo Digital Input: 32kHz, 44.1kHz and 48kHz Sources Accepted

S/N: 110dBA
THD+N: 0.005%
Frequency Response (Bypass): 20Hz - 20Hz (+- 1dB)

Power Supply: Switching Power Supply
Remote Control: USB, RS485

Dimensions: 9.25" x 19" x 1.75" (234.95 x 482.6 x 44.45 mm)
Weight: 6.3lb (2.86kgs)





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DSPOT

DIGITAL SIGNAL PROCESSOR

DS-EQ230

Specifications in this manual are subject to change without notice.
For the most up to date manual and information
visit www.galaxyaudio.com.

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V02072014