DS-SP24

USER'S MANUAL

DSPOT
DIGITAL SIGNAL PROCESSOR

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DS-SP24

DS-SP24
GALAXY AUDIO
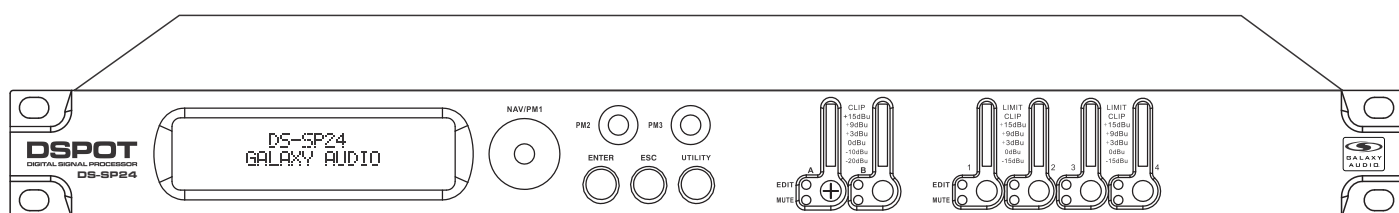
2x4 Speaker Processor

19"
(482mm)

DIGITAL

USB

GALAXY
AUDIO

Contents

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.

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 manu-facturer'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 dam-Aged, 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.

Described below are the functions of the front panel control buttons and encoders for The DS-SP24.
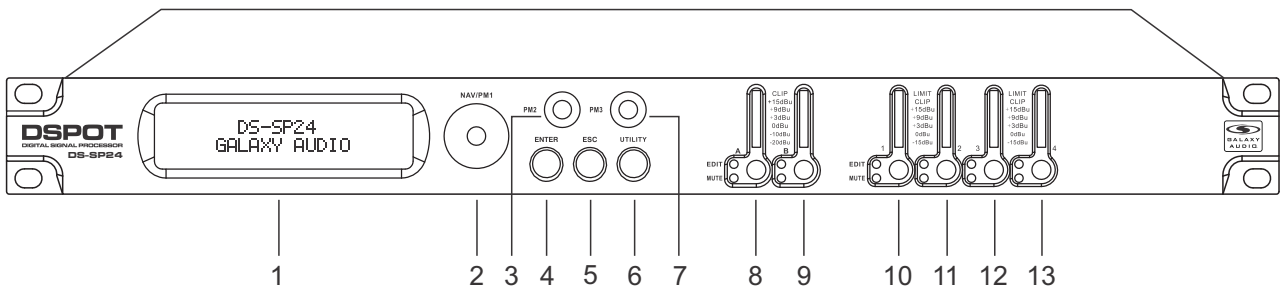
1 - LCD Display

2 - Navigation/Parameter 1 Key

3 - Parameter 2 Key

4 - Enter Key

5 - Escape Key

6 - Utility Key

7 - Parameter 3 Key

8 - Input A Edit/Mute Button

9 - Input B Edit/Mute Button

10 - Output 1 Edit/Mute Button

11 - Output 2 Edit/Mute Button

12 - Output 3 Edit/Mute Button

13 - Output 4 Edit/Mute Button

Getting Started

When the DS-SP24 is turned ON the device model name will appear in the LCD screen:

> **DS-SP24**
> **GALAXY Audio**

A status bar will show the progress of the DS-SP24 initialization process:

> **DS-SP24**
> ▮▮▮▮▮▮▮▮▮▮▮▮▮

The DS-SP24 has two factory pre-set working modes: "1x2 Way X-Over" and "4 Way X-Over".
After the initialization, the DS-SP24 will show on the LCD the first of the embedded preset working modes, or the last one selected prior to the unit being turned off.
First time activation will default to the first of the preset working modes.

> **DS-SP24**
> **1x2 WAY X-OVER**

• Encoders and ENTER, ESC buttons

The DS-SP24 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, A/B and 1/2/3/4 buttons

The UTILITY button allows the User to enter the Sub-menus and set the general characteristics of the Processor. The A and B buttons allow the User to enter the Editing Menus of the Processor's Input Channels and buttons 1, 2, 3 and 4, allow the User to enter the Editing Menus of the Processor's Output Channels.

The A and B buttons as well as the 1, 2, 3 and 4 buttons have double functions dependent on the push and hold time.

When the A and B buttons are pushed and held for more than one second Input Channels A or B are either MUTED or UN-MUTED. 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 A and B buttons enters the Editing Mode for the Input Channels (see later for the Input Channel Editing details).
The blue "EDIT" LED will now be ON.

When the 1, 2, 3 and 4 buttons are pushed and held for more than one second the Output Channels 1, 2, 3, and 4 are either MUTED or UN-MUTED. The red LED will illuminate when the Channel is MUTED. When the "MUTE" LED is OFF, then the related Output Channel is UN-MUTED.

A momentary push of the 1, 2, 3 and 4 buttons enters the Editing Menu for the Output Channels (see later for the Output Channel Editing details). The blue "EDIT" LED will now be ON.

• DS-SP24 Menu and Sub-Menu Structures

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

```
DS-SP24
1x2 WAY X-OVER
```

From this point, sub-menus are accessed using the "UTILITY", "A/B", "1/2/3/4", "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 to access the "UTILITY" menu by pushing the "UTILITY" button and the Sub-Menus pages can be selected by rotating the "NAV/PM1" encoder clockwise and counter-clockwise.
Once selecting the sub-menu page, using the "ENTER" button will access the Sub-Menu pages, again "scrollable" using the "NAV/PM1" encoder and accessible for parameter editing again pushing the "ENTER" button.
Through the "ESC" button, it is any time possible to go back to the page preceding the "ENTER" button use.
Once inside the Sub-Menus pages, 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 without an 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-SP24 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:

– System Setup: this page allows the selection of the operating mode of the DS-SP24:

```
SYSTEM UTILITY
-    System Setup    -
```

The operating mode can be chosen from a selection of 2 Xover options

1x 2 WAY ……… .in this operating mode, the DS-SP24 is configured as a 2 Input to 4 Output X-Over, where the 2 Inputs are automatically assigned to the Outputs as follows:
– Input A to Outputs 1/2 [Out1=LowA and Out2=HighA]
– Input B to Outputs 3/4 [Out3=LowB and Out4=HighB]

4 WAY ……. . .in this operating mode, the DS-SP24 is configured as a Mono Input to 4 Output X-Over, where the Input A is automatically assigned to the Outputs as follow:
– Input A to Outputs 1/2/3/4 [Out1=Band-1, Out2=Band-2, Out3=Band-3 and Out4=Band-4]

By pressing ENTER on the System Setup page and rotating the "PM2" or "PM3" encoder, it is possible to select all the available X-Over preset modes.

When the "1x2 WAY XOVER" is selected, the "System Setup" page will appear as follows:

```
          System Setup
   Setup:  1x2  WAY XOVER   *
```

To change the desired operating mode for the DS-SP24, the screen must reflect the X-Over required and then simply pressing the "ENTER" button will bring up the following screen asking for confirmation to load the selected operating mode:

```
New Xover
[Enter]  to  confirm
```

If confirmed by pressing ENTER the selected preset mode will load. While the device is configuring the X-Over the following screen will be appear:

```
Please Wait . . . . .
Changing Xover
```

The new preset mode will now be shown with an asterisk.

– Input Routing: the DS-SP24 Processor is equipped with 2 Analog Inputs (Balanced Female XLR) and a stereo S/PDIF Digital Input (RCA connector).
The "Routing Options" page allows you to select the desired Input type:

```
        SYSTEM UTILITY
    -   Input Routing    -
```

By pressing ENTER on Input Routing and then rotating the "PM2" or "PM3" encoders, it is possible to select the Main Inputs for the DS-SP24, allowing the User to choose between Analog or S/PDIF Digital.
The selection can be confirmed by pressing the "ENTER" button.
The following screen shows that the Analog Input has been selected:

```
          Input Routing
      Source:   Analog        *
```

– 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")

```
        SYSTEM UTILITY
      -   Delay Units    -
```

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):

```
          Delay Units
      Unit  :    Time   (ms)      *
```

– Software Version:
This page allows you to confirm the Software Version running on the DS-SP24:

```
        SYSTEM UTILITY
      -   Software Version    -
```

Program Utilities Sub-menu – this sub-menu allows you to access several options related to the DS-SP24 operating mode and to manage the presets stored and recallable within the Unit:

```
          UTILITY MENU
      -   Program Utilities    -
```

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. You can store up to 24 presets in the DS-SP24 memory:

```
        PROGRAM UTILITY
      -   Recall a Program    -
```

By pressing ENTER and rotating the "PM2" or "PM3" encoders, it is possible to scroll through all current available user presets.
If NO USER PRESETS are stored yet, the screen will show the following:

```
        Recall a Program
        No Stored Xovers
```

If presets have previously been stored by the user, anyone of them can be recalled:

```
    [ENTER] to Recall.
     01:    PRESET 1
```

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-SP24 to begin to load this selected preset and the following transitory screen will appear:

```
Loading New Program . . . . .
     01:    PRESET 1
```

Once loaded the DS-SP24 will exit to the "Recall a Program" screen automatically and the above screen will disappear:

```
    PROGRAM UTILITY
   -   Recall a Program   -
```

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-SP24's memory:

```
    PROGRAM UTILITY
   -   Save 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 "Save a Program" screen will show empty memory locations
For all 1-24 presets as shown in the example below for location 10:

```
    Save a Program
   10:    Empty Memory
```

When storing an edited configuration for the DS-SP24, 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 "Stage 1 2x2" in location 10:

```
Set Program Name.
10:    Stage 1 2x2      ?
```

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:    Stage 1 2x2      ?
```

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:    Stage 1 2x2
```

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:    Stage 1 2x2      ?
```

If you wish to proceed press "ENTER" again and the DS-SP24 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-SP24 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:     Stage 1 2x2   -
```

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, "Stage 1 2x2", the screen will be the following:

```
[ENTER] to Delete
10:     Stage 1 2x2
```

Confirming the deletion by pressing "ENTER" again, will force the DS-SP24 to erase the selected preset and the following transitory screen will appear:

```
Erasing Xover Memory. . . . .
10:     Stage 1 2x2
```

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-SP24:

```
            UTILITY MENU
      -    Interface Utilities    -
```

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-SP24.

```
          INTERFACE UTILITY
        -    Interface Setup    -
```

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-SP24.
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.

```
          Interface Setup
          Source:    USB            *
```

Security Sub-menu – this sub-menu allows the User to set the parameters shown, lock the DS-SP24 and set a Password therefore limiting the unit's functions and controls to those who have only access to the appropriate Password.

```
            UTILITY MENU
      -    Security Utilities    -
```

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.

```
          SECURITY UTILITY
        -    Show Parameter    -
```

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:

```
Parameter will
not be shown          *
```

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

```
SYSTEM UTILITY
-   Lock Unit   -
```

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.

```
Lock Unit
Lock  :    On          *
```

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 X-Over configuration and the preset selected and beside the preset's name a "keylock" icon indicating that the DS-SP24 is locked.

– User Password: from the "User Password" sub-menu:

```
SECURITY UTILITY
-   User Password   -
```

Press "ENTER" to access the "**User Password**" page:

```
User Password
[                    ]
```

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 "DSSP24" as the password:

```
User Password
[DSSP24]
```

The DS-SP24 will exit the "Unit Lock" sub-menu and jump to the "User Password" sub-menu page screen:

```
SYSTEM UTILITY
-   Insert Password    -
```

If the password entered in the "Confirm Password" page matches the one entered in the "Enter Password" page, the following screen will appear.

```
Confirm Password
[DSSP24]
```

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

The user can now decide to "lock" the DS-SP24 by Password, inhibiting the access to ALL processor functions depending on the setting of the parameter "Password Enable/Disable", explained in the following paragraph.

– Enable Password: from the "Enable Password" sub-menu:

```
SYSTEM UTILITY
-   User Password    -
```

Press "ENTER" to gain access to the "**Enable Password**" screen:

```
Enable Password
Password:   Disable        *
```
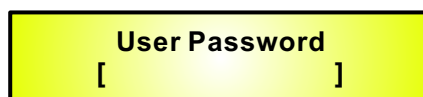
Once a Password has been entered into the DS-SP24 through the steps described in the previous paragraph, it is possible to "Enable" or "Disable" the password function and therefore lock the DS-SP24 restricting access to all functions.

When a password has been entered you will be able to select the "Enable" option from the menu and the unit will not be accessible for editing. In "**Locked by Password Status**", all DS-SP24 functions are inhibited to the User, including the use of the Mute A/B and MUTE 1/2/3/4 buttons. The only access available is to the parameters of the input/output channels (accessible by pressing the edit button), ONLY to READ the values (no editing possible) if the "be shown" flag in the "Show Parameter" Sub-Menu has been selected.

Once "Locked by Password" the "keylock" icon will appear on the default LCD screen and no menu pages will be accessible, with the exception of the "User Password" option.

To regain access to the full operation of the DS-SP24, ENTER to the "User Password" screen and press the UTILITY Button to access the following screen to enable the correct password to be entered:

```
        User Password
        [                    ]
```

After the correct password has been entered, you will be able to access the full functionality of the DS-SP24, the "lock Icon" will disappear from the "Default Screen" and automatically the "Enable Password" page will be back to the "Disable" condition:

```
       Enable Password
       Password:  Disable        *
```
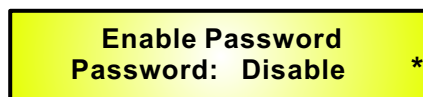
If no Password has been set within the DS-SP24, as described in the previous paragraphs, the DS-SP24 will not allow you to enable any Password, and the choice in the "Enable Password" will be limited to only the "Disable" option.

● **Menu "Input A and B" Input Channels Editing [access by pushing the "A/B" buttons]**

From the "Default Screen", it is possible to access the "Input A and B" menu by pushing the "A" or "B" 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 "NAV/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.

Gain page – from this screen it is possible to set the Input Channels 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 input level of the selected Channel A or B.

The following is an example screen for the "Gain" page that has set the Gain of Input Channel A to +0.0dB:

```
Input-A              Gain
   -> Gain = + 0.0dB
```

Delay page – from this page it is possible to set the Input Channels Delay Time from 000.0000mS 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 Input Channel A is set to 160.1872mS:

```
Input-A              Delay
   -> Delay = 160.1872mS
```

EQ: [x] sub-menu – from this sub-menu it is possible to set the Input Channels five available Parametric or Shelving Filters.

```
Input-A              EQ-X
   1.00KHz  BW1.05  0.0dB
```

The DS-SP24 allows the user to select either Bell or Shelving Parameters and assign them independently using the 5 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:

```
Input-A              EQ-1
-> 1.00KHz  BW1.06  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:

```
Input-A                  EQ-1
->1.00kHz BW=1.00 + 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:

```
Input-A                  EQ-1
->1.00kHz  -6LoSh  + 3.0dB
```

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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.
The EQ sub-menu screen will show the following:

```
Input-A                    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-SP24 system status once leaving the page.

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

● Menu "Output 1/2/3/4" Output Channels Editing [access by pushing the "1/2/3/4" buttons]

From the "Default Screen", it is possible to access the "Output Channel" menu by pressing the "1" or "2" or "3" or "4" 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 "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.

HPF sub-menu – from this sub-menu it is possible to set the Output 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 Output1… using the name "High" (see later for assigning a Name to the outputs):

```
Out-1   High                HPE
 -> 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 X-Over'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-SP24 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 Output 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 Output1… using the name "Low" (see later for assigning a Name to the outputs):

```
Out-1  Low              LPE
-> 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 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 X-Over'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-SP24 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 Output Channels seven available Parametric or Shelving Filters.

```
Out-1        Name        EQ-X
-> 1.00KHz  BW1.05  0.0dB
```

The DS-SP24 allows the user to select either Bell or Shelving Parameters and assign them Independently using the 7 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:

```
Out-1        Name        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:

```
Out-1         Name        EQ-1
->1.00kHz  BW=1.00 + 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:

```
Out-1       Name        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.

```
Out-1       Name        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-SP24 system status once leaving the page.

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

Vu-Meter page – from this page it is possible to select what is shown on the Output LED meters, by using the "PM1" or "PM2" encoders.
The outputs' LED meters can show the Output signal LEVEL or the Output Limiters' activity.
When the Limiters' activity is selected, the LED meters will show, from top down, the activity of the Limiter available on the output.

```
Out-1     Name      Vu-Meter
 -> Vu-Meter  =  Limiter Act
```

When the Output signal Level selected, the LED meters will show, from bottom up, the level of the signal:

```
Out-1     Name      Vu-Meter
  -> Vu-Meter        Level
```

Name page – from this screen it is possible to assign a 6 character name to the Output Channel. The following is an example screen for a "Name" page labeled "Low" for Output Channel 1:

```
Out-1      Low       Name
  Name  =  Low
```

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

```
Out-1      Low        Name
-> Name   =  Low
```

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 "Sub" replacing our previous name of "Low":

```
Out-1       Sub        Name
     Name   =  Sub
```

Source page – from this page it is possible to assign one of the following Inputs to any Output Channel:

1. Input A
2. Input B
3. Sum of Input A and Input B

The following is an example screen for the "Source" where Input A is assigned to Output Channel 1:

```
Out-1      Name       Source
     Source  =  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 Output Channels 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 input level of the selected Channel 1/2/3/4.
The following is an example screen for the "Gain" page where the Gain of the Output Channel 1 is set to +0.0dB

```
Out-1       Name       Gain
-> Gain   =  +  0.0dB
```

Limiter sub-menu – from this page it is possible to set the Output 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:

```
Out-1      Name      Limiter
 A:  5ms  R:  0.2s  +5.0dB
```

Once 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.

Once pushing ENTER the above screen will change as follows:

```
 Out-1      Name      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"

"**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, then 5ms - from 20ms to 30ms, then 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-SP24 system status once leaving the page.

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

Delay page – from this page it is possible to set the Output Channels Delay Time from 000.0000mS 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 Output Channel 1 is set to 160.1872mS:

```
Out-1       Name       Delay
-> Delay  =  160.187mS
```

Polarity page – from this page it is possible to set the Output Channels 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 Output Channel 1 is set to "Normal"

```
Out-1      Name      Polarity
-> Polarity  =  Normal
```

● **Input and Output Channels Last Edited Parameter Return Function**

Once you have escaped out of parameter editing within the individual Input or Output channels the DS-SP24 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.

● **Input Channels and output Channels LINK Function**

The DS-SP24 is able to perform a unique LINK MODE between Input Channels as well as a link between Output Channels to enable quick and immediate editing (you cannot link output to input channels).

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

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

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

Now all Slave channels and only those selected will modify their parameters accordingly as you edit the Master channel.

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

Note: The LINK function is NOT a COPY function.

If you want to edit the limiter of the Output channels 1, 2, 3 and 4, you can enter the editing mode of Output Channel 1 by pressing the related Edit button and turning on the "Blue" LED below the Output Channel 1 LED meters. This assigns the "role" of Master and displays this channel's Parameters on the LCD:

```
Out-1      Name      Limiter
 A:  5ms  R: 0.2s  +5.0dB
```

Then press the Edit button of Output Channels 2 and 4, turning on their related "Blue" LED's. Now all parameters edited on Output Channel 1, will also be applied to channels 2 and 4.
If you want to remove one of the linked channels 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 Output Channels You jump across to begin editing an Input channel or vice versa.

● **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-SP24 and return the device to the original factory setting, is available to the user.

Note: Continuing with this process will mean the DS-SP24 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-SP24 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-SP24:

<div style="text-align:center; border:2px solid black; background:yellow; padding:10px; font-weight:bold;">
Please Wait. . . . . .
Memory Reset
</div>

3. Release the buttons and wait for the DS-SP24 to re-initialize.

Once completed, the DS-SP24 will resume regular operation as though it was a new unit from the factory and no previously programmed parameters will be available for use.

Using the DS-SP24 Software.
  • Load the Software "SetupDS-SP24V1.0.0" 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-SP24V1.0.0
  • Connect the SDS-SP24 with the USB cable to your computer.
  • Turn on the DS-SP24, the driver software will load automatically.
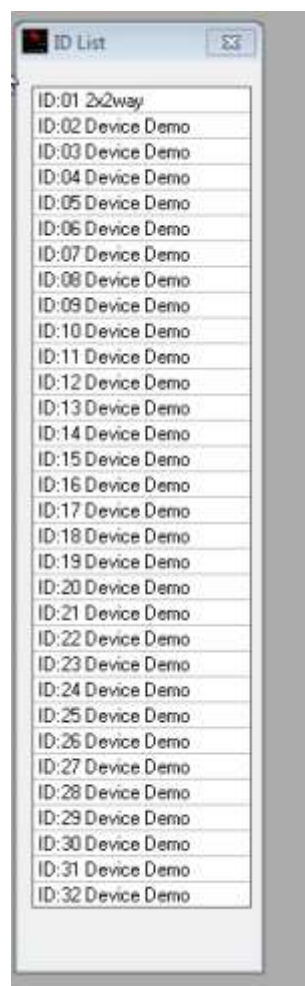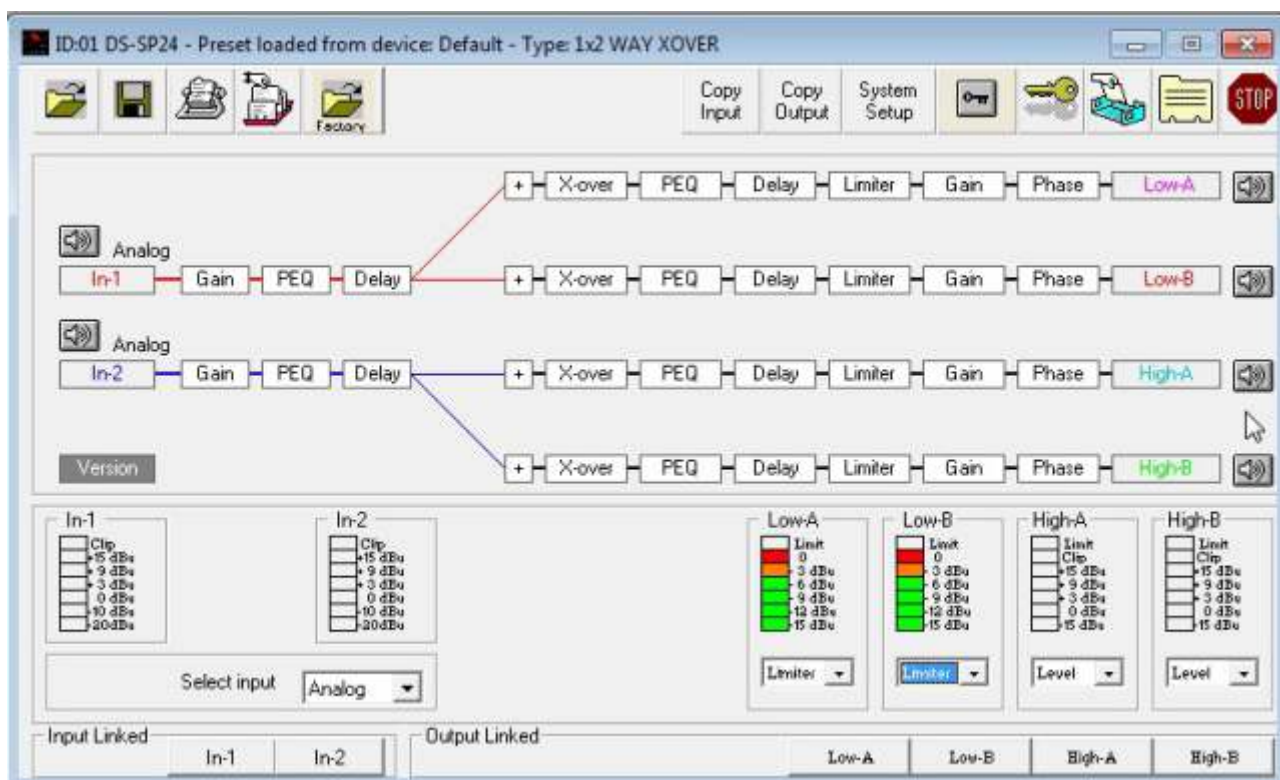 • When the driver has finished loading, click once on "connect".

If you want to continue select "Yes"

Choose your connection type.
Then Click on Connect.

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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"
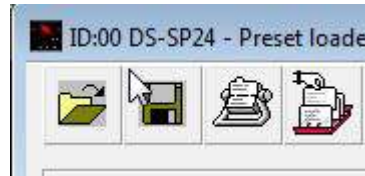

You can name a device by selecting edit device name.
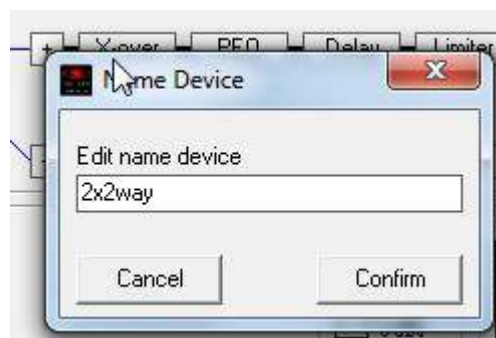
From the main page you can choose the section you want to adjust by clicking on the associated block. Once you have accessed the block you can adjust parameters by either using the sliders, arrows, or typing the values in directly.

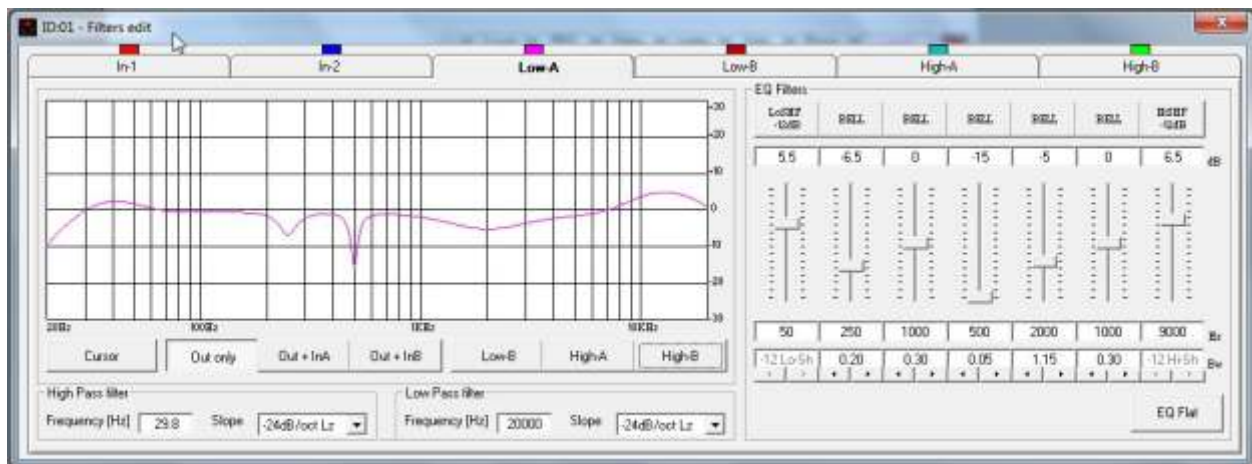Select the input block to access input and output naming.
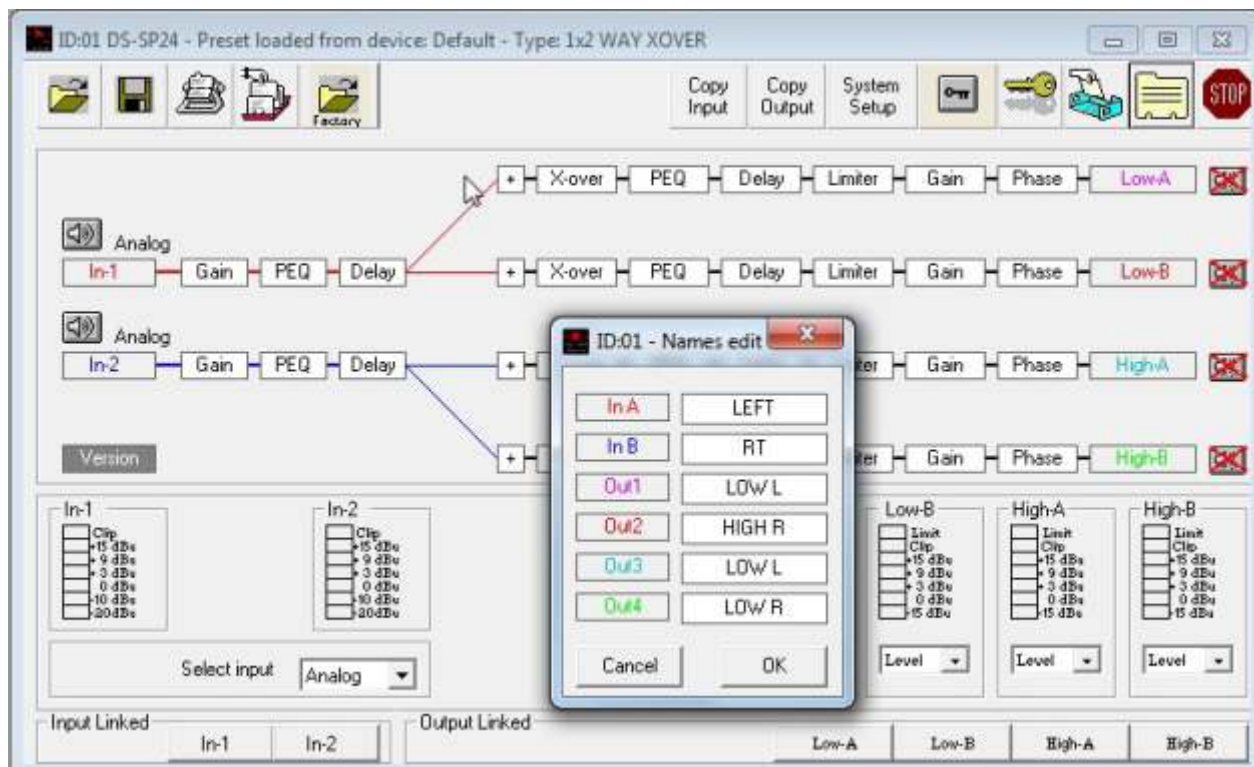
Select the gain block to access the gain and polarity of the inputs and outputs.
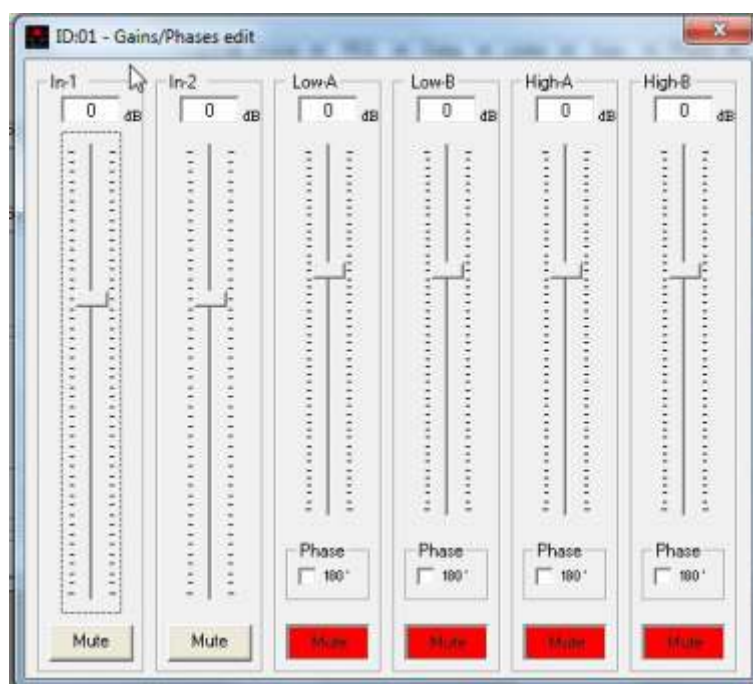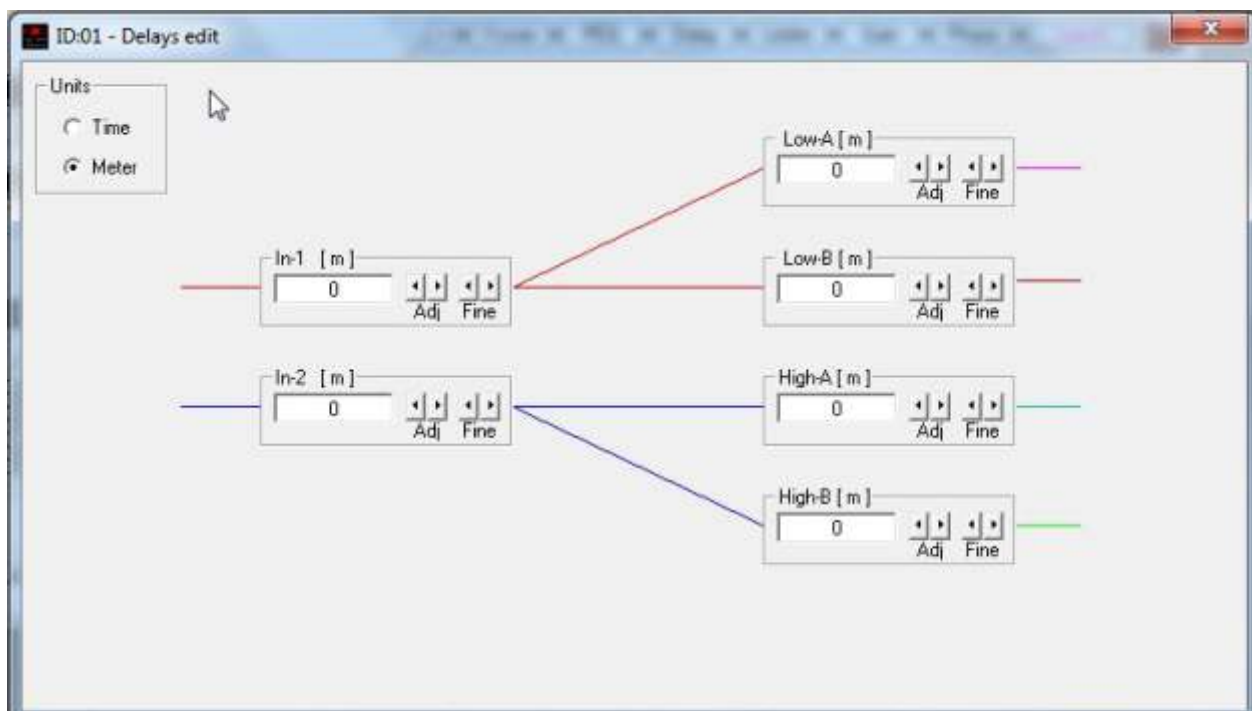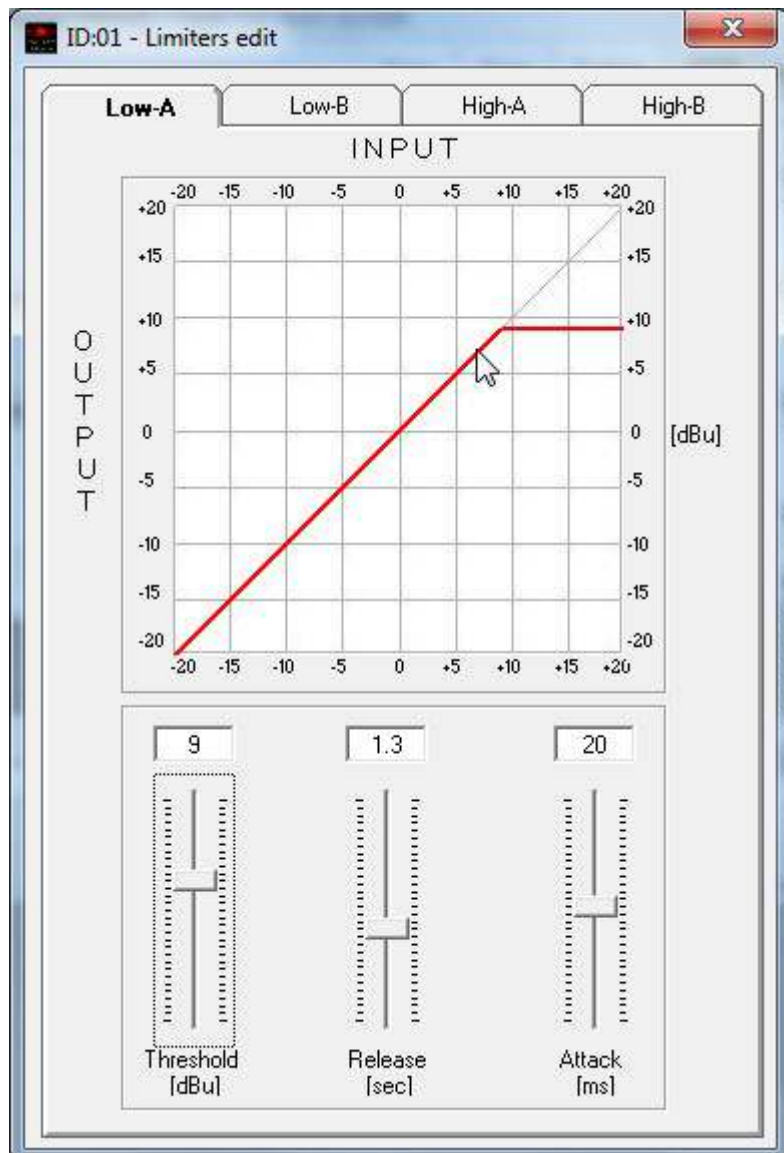
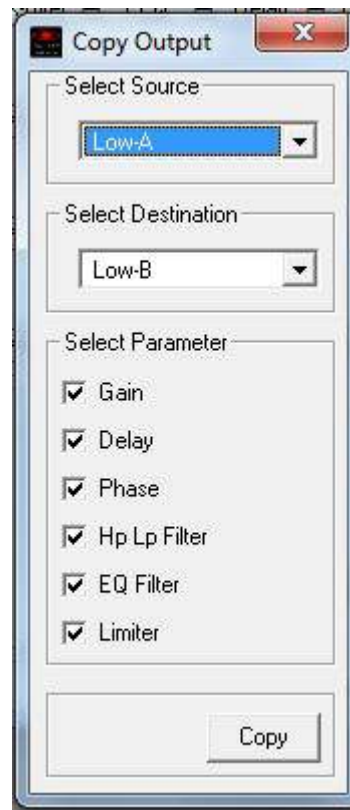Select the PEQ block to access the input and output filters.

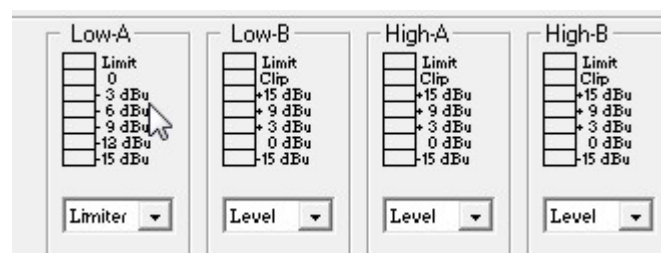Select the Delay block to access the input and output delays.

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.

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

The following is the HEX Code for controlling the DS-SP24 recall presets and master volume control:

Preset Changing:

CMD_RECALL_PRESET: CMD=1BH

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	00H	00H	00H	00H	00H	00H	F7H

XX = 0,..,31 (ID device)
Npreset=0,…,23 Presetnumber

The DS-SP24'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.

RX:

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	C1H	XX	1BH	NPreset	00H	00H	00H	00H	00H	00H	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	FFH	00H	00H	00H	00H	00H	00H	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, 4, 5).
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,…,5: Channel selected, 0, 1=In1, In2; 2,…,5=Out1,..,Out4; when Channel 0, 1 selected, then Vol=Input
Gain, when Channel 2, 3, 4, 5 selected, then Vol= Output Vol.
Phs= Phase only if the Chn> 1; Value=0, 1 where 0=direct, 1=inverse (180')
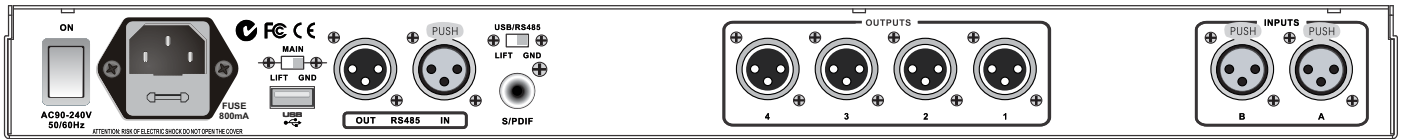**Vol= Gains from 0 to 180 (-12dB/ +6dB step 0.1dB)**

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

● **DS-SP24 Technical Specifications**

The DS-SP24 Digital Speaker Processor is based on a powerful analog and digital DSP platform having the following specifications:

Analog Input Signal: ChA/ChB Bal. Female XLR
Maximum Input Level: +20dBu
Analog Output Signal: Ch1/Ch2/Ch3/Ch4 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: 48kHz
S/PDIF Stereo Digital Input: 32kHz, 44.1kHz and 48kHz Sources Accepted

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

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-SP24

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