

PROFESSIONAL
DIGITAL SOUND PROCESSORS

User's



Manual



DPA4448QRT
Speaker Management



Catalog

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IMPORTANT SAFETY INSTRUCTIONS



Note: in order to ensure safety, please read these instructions carefully

All safety and operating instructions should be read before the product is operated.



Attention: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture!

1 Ventilation

Do not block any ventilation openings.



2 Cleaning

Clean only with dry cloth.



3 Heat sources

Do not install near any heat sources such as radiators, stoves, or other apparatus that produce heat.



4 Power cord protection

Protect the power cord from being walked on or pinched particularly at plugs.



5 Overload

Power plug should not overload.



6 Objects or liquid entry inside the unit

Be careful that no objects fall or liquid is spilled inside the unit through ventilation openings.



7 Humidity

The unit should far away from water.



8 Maintenance

Refer all servicing to qualified service personnel. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.



DPA4448QRT Digital Speaker Processor

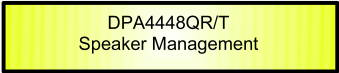
User Manual



Described below are the functions of the front panel control buttons and encoders for the DPA4448QRT.

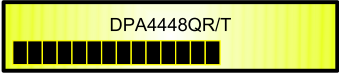
- **Getting Started**

As soon as the DPA4448QRT is turned ON the device model name will appear in the LCD screen:



DPA4448QR/T
Speaker Management

and a status bar will show the progress of the DPA4448QRT initialization process:




DPA4448QR/T

A progress bar consisting of 10 small black squares, with the first 5 squares filled in black and the remaining 5 squares empty.

The DPA4448QRT has three factory pre-set working modes: "2x2 Ways Xover + Sub", "2x3 Ways Xover" and "6 Ways Xover".

After the initialization, the DPA4448QRT 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.



DPA4448QR/T
2x3 WAY X-OVER

- **Encoders and ENTER, ESC buttons**

The DPA4448QRT 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/C/D 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, B, C and D 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, B, C and D buttons as well as the 1, 2, 3 and 4 buttons have double functions dependent on the push and hold time.

When the A, B, C and D buttons are pushed and held for more than one second Input Channels A, B, C or D 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.

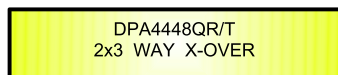
A momentary push of the A and B buttons enters the Editing Mode for the Input Channels (see later for the Input Channel Editing details).
The blue "EDIT" LED will now be ON.

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 unmuted. 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.

- **DPA4448QRT Menu and Sub-Menu Structures**

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



From this point, sub-menus are accessed using the UTILITY", "A/B/C/D", "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 MENU" [Access by pushing the "UTILITY" button]

NAV/PM1 Encoder

[to navigate between menus]

PM2 or PM3 Encoder

[to chose option, then ENTER to load it;
(*) indicates the selected option]

1 UTILITY MENU:.....

<< System Utilities >>

ENTER  ESC

1.1 SYSTEM UTILITY:
<< System Setup >>

ESC
ENTER

System Setup
Setup: 2x2 WA+ SUB *
Setup: 2x3 WAY XOVER
Setup: 6 WAY XOVER

1.2 SYSTEM UTILITY:
<< Input Routing >>

ESC
ENTER

Input Routing
Source: Analog *
Source: Digital

1.3 SYSTEM UTILITY:
<< Power-On Procedure >>

ESC
ENTER

Power-On Procedure
Fade-In: On *
Fade-In: Off

1.4 SYSTEM UTILITY:
<< Delay Units >>

ESC
ENTER

Delay Units
Unit: Time(ms) *
Unit: Distance (m)

1.5 SYSTEM UTILITY:
<< Ramps on changes >>

ESC
ENTER

Ramps on changes
Ramps: Off *
Ramps: On

1.6 SYSTEM UTILITY:
<< Software Version >>

ESC
ENTER

Software Version
Version: V1.01 *

2 UTILITY MENU:.....

<< Program Utilities >>

ENTER  ESC

2.1 PROGRAM UTILITY:
<< Recall a Program >>

ESC
ENTER

Recall a Program
01: Preset 01
: : 24: Preset 24

2.2 PROGRAM UTILITY:
<< Save a Program >>

ESC
ENTER

Save a Program
01: Preset 01
: : 24: Preset 24

2.3 PROGRAM UTILITY:
<< Delete a Program >>

ESC
ENTER

Delete a Program
01: Preset 01
: : 24: Preset 24

3 UTILITY MENU:.....

<< Interface Utilities >>

ENTER  ESC

3.1 INTERFACE UTILITY:
Interface Setup

ESC
ENTER

Interface Setup
Source: USB *
Source: TCP/IP
Interface Setup
IP ADDR = 192.168.0.101 (up to 132) *

3.2 INTERFACE UTILITY:
Source TCP/IP

4 UTILITY MENU:.....

<< Security Utilities >>

ENTER  ESC

4.1 SECURITY UTILITY:
Show Parameter

ESC
ENTER

Parameter will
be shown *
not be shown

4.2 SECURITY UTILITY:
Lock Unit

ESC
ENTER

Lock Unit *
Lock: Off
Lock: On

4.3 SECURITY UTILITY:
User Password

ESC
ENTER

User Password
[]

4.4 SECURITY UTILITY:
Enable Password

ESC
ENTER

Enable Password
Password: Enable *
Password: Disable

(For the details about the Password Setting/Enable
and Unit Lock, refer to the "Utility Menus Use"
Section)

MENU "Input A/B/C/D" Input Channels Editing [Access by pushing the "A/B/C/D" buttons]

NAV/PM1 Encoder

[to navigate between menus]

NAV/PM1 Enc.

[to chose values for the parameters, no need to confirm the chosen values, which are automatically loaded during the encoders use]

PM2 Enc.

PM3 Enc.

1. Input A/B/C/D

Gain = + 0.0 dB

ENTER   ESC

Gain

-> Gain = + 0.0 dB

PM1 N/A

-12 dB
:
+6 dB

Same as PAR2

2. Input A/B/C/D

Delay = 0.000 ms

ENTER   ESC

Delay

-> Delay = 0.000 ms

PM1 N/A

000.0000mS
[1 ms steps]
848.0000mS

000.0000mS
[20.8 us steps]
000.9984mS

3. Input A/B/C/D

EQ Bypass = Off

ENTER   ESC

EQ Byp

-> EQ Bypass = Off

PM1 N/A

Off
:
On

Same as PAR2

4. Input A/B/C/D

Byp = Off Type = Y (Y =

EQ-X (X from 1 to 5)

Peaking_Eq, Hi-Shelv_1, Hi-Shelv_2, Hi-Shelv_Q, Lo-Shelv_1, Lo-Shelv_2, Lo-Shelv_Q, Lo-Pass_1, Lo-Pass_2, Lo-Pass_Q, Hi-Pass_1, Hi-Pass_2, Hi-Pass_Q, All Pass_1, All Pass_2, Band Pass, Notch Filt)

ENTER   ESC

-> Byp = Off Type = Y

PM1 N/A

Off
:
On

Peaking_Eq
:
Notch Filt

Through the PM2, it is possible to Byp the single selected filter.
Through the PM3, it is possible to select one of the 17 available filters' type.

Once selected the filter Type and NOT in Byp mode, pressing again the ENTER button can be accessed the selected filter's editing page.

4.1 Input A/B/C/D

-> Byp = Off Type = Y

EQ-[x] (X from 1 to 5)

ENTER   ESC

4.1a. If selected a Peaking_Eq filter, then the filter can be set by the following parameters

Input A/B/C/D

[Freq] [Gain] [Q]

-> 1000Hz +0.0dB Q=1.00

EQ-[x] (up to 5 filters available)

[Freq.] 20Hz
:
20kHz

[Amp.] -15.0 dB
:
+15.0 dB

[Q] 0.30
:
20.00

4.1b. If selected a Hi-Shelv_1 (first order High Shelving) filter, then the filter can be set by the following parameters

Input A/B/C/D

[Freq] [Gain] [Q]

-> 1000Hz +0.0dB Q=----

EQ-[x] (up to 5 filters available)

[Freq.] 20Hz
:
20kHz

[Amp.] -15.0 dB
:
+15.0 dB

[Q] ----
:

4.1c. If selected a Hi-Shelv_2 (second order High Shelving) filter, then the filter can be set by the following parameters

Input A/B/C/D

[Freq] [Gain] [Q]

-> 1000Hz +0.0dB Q=----

EQ-[x] (up to 5 filters available)

[Freq.] 20Hz
:
20kHz

[Amp.] -15.0 dB
:
+15.0 dB

[Q] ----
:

4.1d. If selected a Hi-Shelv_Q (variable Q High Shelving) filter, then the filter can be set by the following parameters

Input A/B/C/D

[Freq] [Gain] [Q]

-> 1000Hz +0.0dB Q=1.00

EQ-[x] (up to 5 filters available)

[Freq.] 20Hz
:
20kHz

[Amp.] -15.0 dB
:
+15.0 dB

[Q] 0.30
:
20.00

4.1e. If selected a **Lo-Shelv_1** (first order Low Shelving) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz +0.0dB Q= ----

[Freq.] 20Hz
:
20kHz

[Amp.] -15.0 dB
:
+15.0 dB

[Q] ----
:

4.1f. If selected a **Lo-Shelv_2** (second order Low Shelving) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz +0.0dB Q= ----

[Freq.] 20Hz
:
20kHz

[Amp.] -15.0 dB
:
+15.0 dB

[Q] ----
:

4.1g. If selected a **Lo-Shelv_Q** (variable Q Low Shelving) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz +0.0dB Q=1.00

[Freq.] 20Hz
:
20kHz

[Amp.] -15.0 dB
:
+15.0 dB

[Q] 0.30
:
20.00

4.1h. If selected a **Lo-Pass_1** (first order Low Pass) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ----dB Q= ----

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] ----
:

4.1i. If selected a **Lo-Pass_2** (second order Low Pass) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ---- Q= ----

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] ----
:

4.1l. If selected a **Lo-Pass_Q** (variable Q Low Pass) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ---- Q=1.00

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] 0.30
:
20.00

4.1m. If selected a **Hi-Pass_1** (first order High Pass) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ----dB Q= ----

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] ----
:

4.1n. If selected a **Hi-Pass_2** (second order High Pass) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ---- Q= ----

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] ----
:

4.1o. If selected a **Hi-Pass_Q** (variable Q High Pass) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ---- Q=1.00

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] 0.30
:
20.00

4.1p. If selected an **All-Pass_1** (first order All Pass) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ----dB Q= ----

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] ----
:

4.1q. If selected an **All-Pass_2** (second order, variable Q All Pass) filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ---- Q=1.00

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] 0.30
:
20.00

4.1r. If selected a **Band Pass** filter, then the filter can be set by
the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz +0.0dB Q=1.00

[Freq.] 20Hz
:
20kHz

[Amp.] -15.0 dB
:
+15.0 dB

[Q] 0.30
:
20.00

4.1s. If selected a **Notch Filtr** filter,
then the filter can be set by the following parameters

Input A/B/C/D EQ-[x] (up to 5 filters available)
[Freq] [Gain] [Q]
-> 1000Hz ----dB Q=1.00

[Freq.] 20Hz
:
20kHz

[Amp.] ----
:

[Q] 0.30
:
20.00

MENU "1/2/3/4 Output Channels Editing" [Access by pushing the "1/2/3/4" buttons]

NAV/PM1 Encoder

[to navigate between menus]

NAV/PM1 Enc.

[to chose values for the parameters, no need to confirm the chosen values, which are automatically loaded during the encoders use]

PM2 Enc.

PM3 Enc.

1. Output[x] [Name] HPF
Y F = 20.0 Hz (Y = Bypass OR Filter Type/Order, where filter type can be Buttw_1st, Buttw_2nd, LRiley_2nd, Bessel_2nd, Buttw_3rd, Buttw_4th, LRiley_4th, Bessel_4th, Custom_2nd, Custom_3rd, Custom_4th)

ENTER ↑ ESC

-> Y F = 20.0 Hz Freq Fast Selection [Filt Type] Bypass [Freq.] 20Hz
ONLY in Freq Editing Mode :
Custom_4th 20kHz

Through the PM2, it is possible to Bypass the filter or to select one of the 11 available filters' type/orders, and through the PM3 to set the HP cutting Frequency (quick fine tuning by 1Hz steps). Once selected the filter Type and pressing again the ENTER button can be accessed the selected filter's Fast Freq.Selection page.

1.1 Output[x] [Name] HPF

-> Y F = 20.0 Hz

ENTER ↑ ESC

- 1.1a. If selected a filter from Buttw_1st up to Bessel_4th, then the filter's Cutting Frequency can be set as follow:

Output[x] [Name] HPF
-> Edit Freq = 250Hz

[Thousands Editor]

[Freq.] 1000Hz
: 20000Hz

[Hundreds Editor]

[Freq.] 100Hz
: 900Hz

[Units Editor]

[Freq.] 1Hz
: 100Hz

- 1.1b. If selected a Custom Filter (from 2nd up to 4th order), depending from the filter's order, the cascade od second order Cells building the filter are available for editing in their Freq and Q parameter, independently.

For proceeding with the editing of a custom filter Cell, the PM1 is here used for the Cell selection.
So, a Custom Filter can be set in its parameters, as follow:

1.1b.1. If selected a Custom_2nd filter

Output[x] [Name] HPF
->Custom_2nd F = 250Hz

- Filtx F = 250Hz Q = 0.3

[2nd order Cells selection]

[2nd Ord Cell x] x=1
: x=1

[Freq.] 20Hz
: 20kHz

[Q] 0.05
: 10.00

1.1b.2. If selected a Custom_3rd filter

Output[x] [Name] HPF
->Custom_3rd F = 250Hz

- Filtx F = 250Hz Q = 0.3

[2nd Ord Cell x] x=1
: [Q not available] x=2

[Freq.] 20Hz
: 20kHz

[Q] 0.05
: 10.00

1.1b.3. If selected a Custom_4th filter

Output[x] [Name] HPF
->Custom_4th F = 250Hz

- Filtx F = 250Hz Q = 0.3

[2nd Ord Cell x] x=1
: x=2

[Freq.] 20Hz
: 20kHz

[Q] 0.05
: 10.00

Once editing the Cells "Filtx", pressing the Enter Button can be accessed also for the Custom Filters the page for the fast frequency setting, as available for the NOT Custom Filters and which way of working is described at the point 1.1a.


2. Output[x] [Name] LPF

Y F = 20.0 Hz (Y = Bypass OR Filter Type/Order, where filter type can be Buttw_1st, Buttw_2nd, LRiley_2nd, Bessel_2nd, Buttw_3rd, Buttw_4th, LRiley_4th, Bessel_4th, Custom_2nd, Custom_3rd, Custom_4th)

ENTER ↑ ESC

-> Y F = 20.0 Hz Freq Fast Selection [Filt Type] Bypass [Freq.] 20Hz
ONLY in Freq Editing Mode :
Custom_4th 20kHz

Through the PM2, it is possible to Bypass the filter or to select one of the 11 available filters' type/orders, and through the PM3 to set the HP cutting Frequency (quick fine tuning by 1Hz steps). Once selected the filter Type and pressing again the ENTER button can be accessed the selected filter's Fast Freq.Selection page.

2.1 Output[x] [Name] LPF
 -> Y F = 20.0 Hz
 ENTER  ESC

2.1a. If selected a filter from Buttw_1st up to Bessel_4th, then the filter's Cuting Frequency can be set as follow:

Output[x] [Name] LPF	[Thousands Editor]	[Hundreds Editor]	[Units Editor]
-> Edit Freq = 250Hz	[Freq.] 1000Hz	[Freq.] 100Hz	[Freq.] 1Hz
	20000Hz	900Hz	100Hz

2.1b. If selected a Custom Filter (from 2nd up to 4th order), depending from the filter's order, the cascade of second order Cells building the filter are available for editing in their Freq and Q parameter, independently.

For proceeding with the editing of a custom filter Cell, the PM1 is here used for the Cell selection.
 So, a Custom Filter can be set in its parameters, as follow:

2.1b.1. If selected a Custom_2nd filter

Output[x] [Name] LPF	[2 nd order Cells selection]		
->Custom_2nd F = 250Hz	[Freq.] 20Hz	[Q] 0.05	
-> Flttx F= 250Hz Q = 0.3	[2 nd Ord Cell x] x=1	20kHz	10.00
	x=1		

2.1b.2. If selected a Custom_3rd filter

Output[x] [Name] LPF	[Freq.] 20Hz	[Q] 0.05	
->Custom_3rd F = 250Hz			
-> Flttx F= 250Hz Q = 0.3	[2 nd Ord Cell x] x=1	20kHz	10.00
	[Q not available] x=2		

2.1b.3. If selected a Custom_4th filter

Output[x] [Name] LPF	[Freq.] 20Hz	[Q] 0.05	
->Custom_4th F = 250Hz			
-> Flttx F= 250Hz Q = 0.3	[2 nd Ord Cell x] x=1	20kHz	10.00
	x=2		

Once editing the Cells "Flttx", pressing the Enter Button can be accessed also for the Custom Filters the page for the fast frequency setting, as available for the NOT Custom Filters and which way of working is described at the point 1.1a.

3. Out-[x] EQ-[x] (X from 1 to 5)

Byp = Off Type = Y (Y = Peaking_Eq, Hi-Shelv_1, Hi-Shelv_2, Hi-Shelv_Q, Lo-Shelv_1, Lo-Shelv_2, Lo-Shelv_Q, Lo-Pass_1, Lo-Pass_2, Lo-Pass_Q, Hi-Pass_1, Hi-Pass_2, Hi-Pass_Q, All Pass_1, All Pass_2, Band Pass, Notch Filt)

ENTER  ESC

-> Byp = Off	Type = Y	PM1 N/A	Off	Peaking_Eq
			On	Notch Filt

Through the PM2, it is possible to Byp the single selected filter.
 Through the PM3, it is possible to select one of the 17 available filters' type.

Once selected the filter Type and NOT in Byp mode, pressing again the ENTER button can be accessed the selected filter's editing page.

3.1 Out-[x] EQ-[x] (X from 1 to 5)

-> Byp = Off Type = Y

ENTER  ESC

3.1a. If selected a Peaking_Eq filter, then the filter can be set by the following parameters

Out-[x]	[Freq.]	[Gain]	[Q]	
-> 1000Hz	+0.0dB	Q=1.00		
	[Freq.] 20Hz	[Amp.] -15.0 dB	[Q] 0.30	
	20kHz	+15.0 dB	20.00	

3.1b. If selected a Hi-Shelv_1 (first order High Shelving) filter, then the filter can be set by the following parameters

Out-[x]	[Freq.]	[Gain]	[Q]	
-> 1000Hz	+0.0dB	Q=----		
	[Freq.] 20Hz	[Amp.] -15.0 dB	[Q] ----	
	20kHz	+15.0 dB	----	

3.1c. If selected a Hi-Shelv_2 (second order High Shelving) filter, then the filter can be set by the following parameters

Out-[x]	[Freq.]	[Gain]	[Q]	
-> 1000Hz	+0.0dB	Q=----		
	[Freq.] 20Hz	[Amp.] -15.0 dB	[Q] ----	
	20kHz	+15.0 dB	----	

3.1d. If selected a Hi-Shelv_Q (variable Q High Shelving) filter, then the filter can be set by the following parameters

Out-[x]	[Freq.]	[Gain]	[Q]	
-> 1000Hz	+0.0dB	Q=1.00		
	[Freq.] 20Hz	[Amp.] -15.0 dB	[Q] 0.30	
	20kHz	+15.0 dB	20.00	

3.1e. If selected a **Lo-Shelv_1** (first order Low Shelving) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	+0.0dB	Q=----	20Hz	-15.0 dB	----
			:	:	:
			20kHz	+15.0 dB	----

3.1f. If selected a **Lo-Shelv_2** (second order Low Shelving) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	+0.0dB	Q=----	20Hz	-15.0 dB	----
			:	:	:
			20kHz	+15.0 dB	----

3.1g. If selected a **Lo-Shelv_Q** (variable Q Low Shelving) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	+0.0dB	Q=1.00	20Hz	-15.0 dB	0.30
			:	:	:
			20kHz	+15.0 dB	20.00

3.1h. If selected a **Lo-Pass_1** (first order Low Pass) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----dB	Q=----	20Hz	-----	----
			:	:	:
			20kHz	-----	----

3.1i. If selected a **Lo-Pass_2** (second order Low Pass) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----	Q=----	20Hz	-----	----
			:	:	:
			20kHz	-----	----

3.1l. If selected a **Lo-Pass_Q** (variable Q Low Pass) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----	Q=1.00	20Hz	-----	0.30
			:	:	:
			20kHz	-----	20.00

3.1m. If selected a **Hi-Pass_1** (first order High Pass) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----dB	Q=----	20Hz	-----	----
			:	:	:
			20kHz	-----	----

3.1n. If selected a **Hi-Pass_2** (second order High Pass) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----	Q=----	20Hz	-----	----
			:	:	:
			20kHz	-----	----

3.1o. If selected a **Hi-Pass_Q** (variable Q High Pass) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----	Q=1.00	20Hz	-----	0.30
			:	:	:
			20kHz	-----	20.00

3.1p. If selected an **All-Pass_1** (first order All Pass) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----dB	Q=----	20Hz	-----	----
			:	:	:
			20kHz	-----	----

3.1q. If selected an **All-Pass_2** (second order, variable Q All Pass) filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----	Q=1.00	20Hz	-----	0.30
			:	:	:
			20kHz	-----	20.00

3.1r. If selected a **Band Pass** filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	+0.0dB	Q=1.00	20Hz	-15.0 dB	0.30
			:	:	:
			20kHz	+15.0 dB	20.00

3.1s. If selected a **Notch Fil** filter, then the filter can be set by the following parameters
 Out-[x] EQ-[x] (up to 5 filters available)

[Freq]	[Gain]	[Q]	[Freq.]	[Amp.]	[Q]
-> 1000Hz	-----dB	Q=1.00	20Hz	-----	0.30
			:	:	:
			20kHz	-----	20.00

4. Output[x] [Name] Vu-Meter

Vu-Meter = Level

ENTER ↓ ↑ ESC

-> Vu-Meter = Level

PM1 N/A

Level
Limiter Act.
RMS Cmp Act.

Same as PAR2

5. Output[x] [Name] Name

Name = [Name]

ENTER ↓ ↑ ESC

-> Name = _

(For Editing the Device's Name, refer to the [Details on the "Utility Menus Use"](#) Section)

6. Output[x] [Name] Source

Source = InA

ENTER ↓ ↑ ESC

-> Source = InA

PM1 N/A.

InA (Channel A)
InB (Channel B)
InA+InB (Channel A+ Channel B)

Same as PAR2

7. Output[x] [Name] Gain

Gain = + 0.0 dB

ENTER ↓ ↑ ESC

-> Gain = + 0.0 dB

PM1 N/A

-12 db
:
+6 dB

Same as PAR2

8. Output[x] [Name] RMS Cmp

Thr: +12.0dBu Rto: 1:1

ENTER ↓ ↑ ESC

-> Thr: +12.0dBu Rto: 1:1

PM1 N/A

[Threshold] +20.0dBu [Ratio] 1:1
:
-10.0dBu 32:1

9. Output[x] [Name] RMS Cmp

A: 5ms R: 0.2s Kn= 2%

ENTER ↓ ↑ ESC

-> A: 5ms R: 0.2s Kn= 2%

[Atk time] 5ms
:
200ms

[Rel time] 0.1s
:
3.0s

[Knee.] Hard (00%)
:
Soft (100%)

10. Output[x] [Name] Limiter

A: 5ms R: 0.2s +20dB

ENTER ↓ ↑ ESC

-> A: 5ms R: 0.2s +20dB

[Atk time] 5ms
:
200ms

[Rel time] 0.1s
:
3.0s

[Amp.] -10.0 dB
:
+20.0dB (OFF)

11. Output[x] [Name] Delay

Delay = 0.000 ms

ENTER ↓ ↑ ESC

-> Delay = 0.000 ms

PM1 N/A

000.0000ms 000.0000ms
[1 ms steps] [20.8 us steps]
848.0000ms 000.9984ms

12. Output[x] [Name] Polarity

Polarity = Normal

ENTER ↓ ↑ ESC

-> Polarity = Normal

PM1 N/A

Normal
Invert

Same as PAR2

● 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 DPA4448QRT Start Up and General Configuration:



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 DPA4448QRT:



The operating mode can be chosen from a selection of 3 Xovers options:

2x2 WAY + SUB..... in this operating mode, the DPA4448QRT is performing a 2 Input to 4 Outputs X-Over, plus a SUB configuration, where the 2 Inputs are automatically assigned to the Outputs as follows:

- Input A to Outputs 1/3 [Out1=Low-A and Out3=High-A]
- Input B to Outputs 2/4 [Out2=Low-B and Out4=High-B]
- Input A + Input B to Outputs 5/6 [Out5=Sub-A and Out6=Sub-B]

2x3 WAY..XOVER..... in this operating mode, the DPA4448QRT is performing a 2 Input to 6 Outputs X-Over, where the 2 Inputs are automatically assigned to the Outputs as follows:

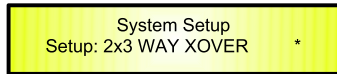
- Input A to Outputs 1/3/5 [Out1=Low-A , Out3=Mid-A and Out5=High-A]
- Input B to Outputs 2/4/6 [Out2=Low-B , Out4=Mid-B and Out6=High-B]

6 WAY ..XOVER..... in this operating mode, the DPA4448QRT is performing a Mono Input to 6 Outputs X-Over, where the Input A is automatically assigned to the Outputs as follow:

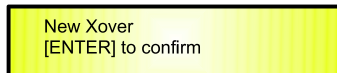
- Input A to Outputs 1/2/3/4 [Out1=Near-1, Out2=Near-2, Out3=Mid-1 and Out4=Mid-2, Out5=Far-1, Out6=Far-2]

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 "2x3 WAY XOVER" is selected, the "System Setup" page will appear as follows:



To change the desired operating mode for the DPA4448QRT, the screen must reflect the xover required and then simply pressing the "ENTER" button will bring up the following screen asking for confirmation to load the selected operating mode:

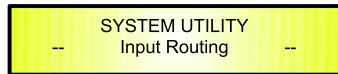


If confirmed by pressing ENTER the selected preset mode will load. While the device is configuring the Xover the following screen will be appear:

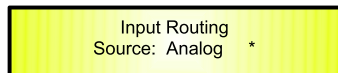


The new preset mode will now be shown with an asterisk.

- **Input Routing:** the DPA4448QRT 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:



By pressing ENTER on Input Routing and then rotating the "PM2" or "PM3" encoders, it is possible to select the Main Inputs for the DPA4448QRT, 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:



- **Power-On Procedure:** this gives you the ability to select the option that will apply when the DPA4448QRT powers up after being switched on:

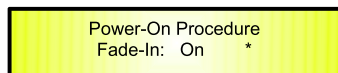


By pressing ENTER and rotating the "PM2" or "PM3" encoder, it is possible to choose between two options: "Fade In On" or "Fade In Off". The currently running option will be displayed with an asterisk to the right of the option description. To change the option simply ENTER on the option not displaying 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 DPA4448QRT is turned on all Outputs regard of their status before the Unit was switched off, will be MUTED or UNMUTED automatically, meaning the DPA4448QRT will have no active Outputs or active Outputs, during the start-up process, depending from the Outputs' previous status.

FADE-In = On... when the DPA4448QRT is turned on all Outputs not previously muted before the Unit was switched off will be active, meaning the DPA4448QRT 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");

```

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) *
  
```

- **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:

```

SYSTEM UTILITY
-- Ramps on Changes --
  
```

When connected to the DPA4448QRT 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:

```

Ramps on changes
Ramps : Off *
  
```

- **Software Version:** this page allows you to confirm the Software Version running on the DPA4448QRT:

```

SYSTEM UTILITY
-- Software Version --
  
```

The correct Software Version is "V1.00"

Program Utilities Sub-menu – this sub-menu allows you to access several options related to the DPA4448QRT 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. You can store up to 24 presets in the DPA4448QRT memory:

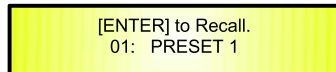


By pressing ENTER and rotating the "PM2" or "PM3" encoders, it is possible to scroll through all current available user presets.

If NO USER PRESETS are stored yet, the screen will show the following:



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



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 DPA4448QRT to begin to load this selected preset and the following transitory screen will appear:



Once loaded the DPA4448QRT 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 recall action by pressing the "ESC" button.

- **Save a Program:** this page allows you to store a new preset in the DPA4448QRT'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 1-24 presets as shown in the example below for location 10:

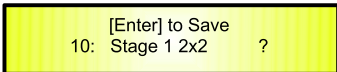


When storing an edited configuration for the DPA4448QRT, select the location for a preset from the **24 available** by using the "PM2" or "PM3" encoders. Once the desired location appears on the screen press ENTER again to reach the "Set Program Name" page. In this page the User can enter a Preset Name (**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:



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:



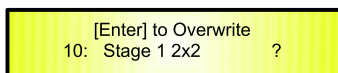
Pressing "ENTER" again, will store the preset in the selected location with the chosen name and the following transitory screen will appear on the LCD:



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



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:



If you wish to proceed press "ENTER" again and the DPA4448QRT 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 DPA4448QRT 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 "Delete a Program" screen will show empty memory locations for all 1-24 presets as shown in the example below for location 10:



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



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 DPA4448QRT 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 TCP/IP] to be used for controlling the DPA4448QRT :

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 DPA4448QRT.

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 TCP/IP) for the DPA4448QRT. 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 *

If selected the TCP/IP option, using the encoders PM2/PM3 and pressing "Enter", the possibility of setting the TCP/IP address for the unit is given turning the PM1 counter clockwise and adjusting the TCP/IP's first 2 digits from 01 up to 32.

Interface Setup
IP ADDR = 192.168.0.101*

Security Sub-menu – this sub-menu allows the User to set the parameters shown, lock the DPA4448QRT and set a Password therefore limiting the unit's functions and controls to those who have access to the appropriate Password.



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

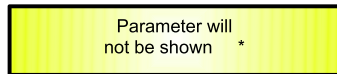
- **Show Parameter:** Pressing ENTER from the above menu will access the "Show Parameter" Sub Menu



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.

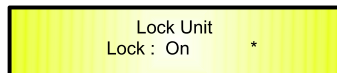
Choosing the "not be shown" option means that once the unit is locked, the parameters will not be shown at all. With this option, when trying to access a parameter, the following screen message will appear:



- **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 XOVER configuration and the preset selected and beside the preset's name a "keylock" icon indicating that the DPA4448QRT is locked.

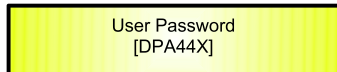
- **User Password:** from the "User Password" sub-menu:



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



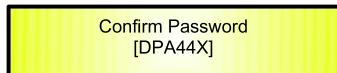
Using the PM2 or PM3 encoders to choose a character and the NAV/PM1" encoder to move between available locations you can enter a **6 Character** Password Name.
The current position of the cursor for the characters to be entered is shown by a "blinking underscore".
During this editing phase, the display is as follows if we were using "DPA44X" as the password:



The DPA4448QRT 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.

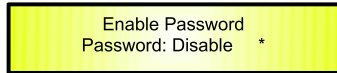
The user can now decide to "lock" the DPA4448QRT by Password, inhibiting the access to ALL processor functions depending on the setting of the parameter "Password Enable/Disable, explained in the following paragraph

Note: originally the DPA4448QRT is initialized with a default Password which value is "000000", value that can be anytime reset with a "Factory Reset" (see "Factory Reset" procedure)

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



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



Once a Password has been entered into the DPA4448QRT through the steps described in the previous paragraph, it is possible to "Enable" or "Disable" the password function and therefore lock the DPA4448QRT 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 DPA4448QRT functions are inhibited to the User, including the use of the Mute A/B/C/D and MUTE 1/2/3/4 buttons.

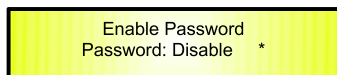
The only access available is to the parameters of the input/output channels (accessible by pressing the edit button), ONLY to READ the values (no editing possible) if the "be shown" flag in the "Show Parameter" Sub-Menu has been selected.

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 DPA4448QRT ENTER to the "User Password" screen and press the UTILITY Button to access the following screen to enable the correct password to be entered:



After the correct password has been entered, you will be able to access the full functionality of the DPA4448QRT, the "lock Icon" will disappear from the "Default Screen" and automatically the "Enable Password" page will be back to the "Disable" condition:



If no Password has been set within the DPA4448QRT, as described in the previous paragraphs, the DPA4448QRT 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/B/C/D" Input Channels Editing [access by pushing the "A/B/C/D" buttons]**

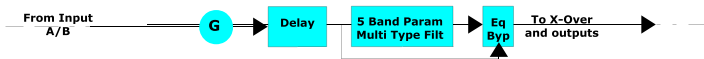
From the "Default Screen", it is possible to access the "Input A/B/C/D" menu by pushing the "A" or "B" button. Once the button is pressed the related blue "EDIT" LED will turn ON. The Sub-Menu pages can now be scrolled through by rotating clockwise and counter-clockwise the "NAV/PM1" encoder. For parameter 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 is AUTOMATICALLY loaded during the encoders' use and stored as current value once left the page.

Note1: once the desired options have been selected using the 3 encoders, they are automatically saved as current and stored in the DPA4448QRT system status once leaving the page.

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

Audio Signal Input (A/B/C/D) Path Block Scheme



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

Input-A	CD -1	Name
	Name = CD -1	

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

Input-A	CD -1	Name
	-> Name = CD -1	

The first letter position will be blinking.

Select the Character position from the 6 available by rotating the "NAV/PAR1" 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 "CD - X" replacing our previous name of "CD -1":

Input-A	CD - X	Name
	Name = CD - X	

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

1. Analog
2. Digital

The following is an example screen for the "Source" where Digital Input is assigned to Input Channel A, which name is "CD - X":

Input-A	CD - X	Source
-> Source = Digital		

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 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, B, C or D.

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

Input-A	CD - X	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	CD - X	Delay
-> Delay = 160.1872mS		

EQ Byp page – from this sub-menu it is possible to Bypass or to make active the 5 Bands Equalizer placed on the Input Signal Path.

Input-A	CD - X	EQ Byp
Eq Bypass = Off		

When Bypassed the 5 Bands Equalizer, its current setting will not be lost.

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

Anyone of the 5 filters of the Eq can be selected choosing from the following list of filter types:

1. **Peaking_Eq**: Peaking (Bell) filters, adjustable as Center Frequency, Gain and Q
The DPA4448QRT Peaking filters are at constant Q, so with Q not depending from the selected Gain value.
2. **Hi-Shelv_1**: High Shelving filters of the 1st order.
These Shelving filter present 3dB less than the selected Gain, or 3dB more than the selected Attenuation, at the selected cutting frequency, and a slope of 6dB/Oct.
3. **Hi-Shelv_2**: High Shelving filters of the 2nd order.
These Shelving filters present 3dB less than the selected Gain, or 3dB more than the selected Attenuation, at the selected cutting frequency, and a slope of 12dB/Oct.
4. **Hi-Shelv_Q**: Symmetrical High Shelving filters with Variable Q.
These Shelving filters present ½ level of the selected Gain/Attenuation at the selected cutting frequency, and a slope that is depending from the chosen Q value.
5. **Lo-Shelv_1**: Low Shelving filters of the 1st order.
These Shelving filters present 3dB less than the selected Gain, or 3dB more than the selected Attenuation, at the selected cutting frequency, and a slope of 6dB/Oct.
6. **Lo-Shelv_2**: Low Shelving filter of the 2nd order.
These Shelving filters present 3dB less than the selected Gain, or 3dB more than the selected Attenuation, at the selected cutting frequency, and a slope of 12dB/Oct.
7. **Lo-Shelv_Q**: Symmetrical Low Shelving filters with Variable Q.
These Shelving filters present ½ level of the selected Gain/Attenuation at the selected cutting frequency, and a slope that is depending from the chosen Q value.
8. **Low Pass_1**: Low Pass filters of the 1st order, with -3dB attenuation at the cutting frequency and a slope of 6dB/Oct.
9. **Low Pass_2**: Low Pass filters of the 2nd order, with -3dB attenuation at the cutting frequency and a slope of 12dB/Oct.
10. **Low Pass_Q**: Low Pass filters with Variable Q.
11. **High Pass_1**: High Pass filters of the 1st order, with -3dB attenuation at the cutting frequency and a slope of 6dB/Oct.
12. **High Pass_2**: High Pass filters of the 2nd order, with -3dB attenuation at the cutting frequency and a slope of 12dB/Oct.
13. **High Pass_Q**: High Pass filters with Variable Q.
14. **All Pass_1**: Filters allowing a FLAT Amplitude response and adding a 90 Degree Phase rotation at the selected Frequency.
15. **All Pass_2**: Filters allowing a FLAT Amplitude response and adding a 180 Degree Phase rotation at the selected Frequency.
16. **Band Pass**: Filters allowing to pass the band “around” the selected frequency.
The amount of passing band is decided by the Q value
17. **Notch Filt**: Filters canceling the band “around” the selected frequency.
The amount of canceled band is decided by the Q value

More, the DPA255Q-R Is giving the possibility to “Bypass” any single filter of the 5 available in the Equalizer section; Once in the editing page of the single filter, a “ByP” field is available for making the single filter active or not

Input-A	CD – X	EQ-X
Byp=Off	Type=Peaking_Eq	

Pushing the Enter Button, the above window will allow the access to the "Byp" and "Type" fields.

Input-A	CD – X	EQ-X
->Byp=Off	Type=Peaking_Eq	

Using the PM2 encoder, the selected Filter can be activated or bypassed.

The DPA4448QRT allows the user to select anyone of the filter's type listed above and assign them independently using the 5 available filters.

In order to select the filter's type, it is necessary to use the PM3 encoder, rotate it "clockwise" or "counter-clockwise" to select the desired filter.

So, in order to define the filter type for the filter number 1 ("x"=1), it is necessary from the above screen, to select the filter, which name will appear on the screen.

If selected a Peaking_Eq filter, then the display will be as follow:

Input-A	CD – X	EQ-1
->Byp=Off	Type=Peaking_Eq	

Once selected the desired Filter Type, its parameters can be accessed for editing just pressing again the ENTER Button.

Once pressed the ENTER Button, the editing page of the selected filter type will be accessed ONLY if the selected filter it is not set in Bypass mode.

Depending from the selected filter, the related parameters will be available for editing

Peaking_Eq Filter: Peaking filters are at constant Q, so with Q not depending from the selected Gain value. If we selected a Peaking_Eq filter within EQ-1, then the Q has to be set at a desired value of say 1.00 using the PM3 encoder, the GAIN at say +3dB using the PM2 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	CD – X	EQ-1
->1.00kHz	+3.0dB	Q=1.00

Once in the Peaking_Eq 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, Gain and Q:

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

"Gain": the selectable Gain range is from -15dB to +15dB in steps of 0.5 dB and can be adjusted by rotating the "PM2" encoder.

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Hi_Shelv_1/2 Filter: These Shelving filters present 3dB less than the selected Gain, or 3dB more than the selected Attenuation, at the selected cutting frequency, and a slope of 6dB/Oct-12dB/Oct. If we selected a High Shelving filter of the 1st/2nd order within EQ-1, then the GAIN has to be set at a desired value of say +3dB using the PM2 encoder and the Lo Cut Frequency at say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	+3.0dB	Q=----

Once in the Hi-Shelv_1/2 Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM2" encoders for editing the Filter's Low Cut Frequency and Gain:

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

"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 "PM2" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Hi_Shelv_Q Filter: These Symmetrical Shelving filters present ½ level of the selected Gain/Attenuation at the selected cutting frequency, and a slope that is depending from the chosen Q value.

If we selected a High Shelving filter with variable Q within EQ-1, then the GAIN has to be set at a desired value of say +3dB using the PM2 encoder, the Q at 3.5 and the Lo Cut Frequency at say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	+3.0dB	Q= 3.5

Once in the Hi-Shelv_Q 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, Gain and Q:

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

"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 "PM2" encoder.

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Lo_Shelv_1/2 Filter: These Shelving filters present 3dB less than the selected Gain, or 3dB more than the selected Attenuation, at the selected cutting frequency, and a slope of 6dB/Oct-12dB/Oct. If we selected a Low Shelving filter of the 1st/2nd order within EQ-1, then the GAIN has to be set at a desired value of say +3dB using the PM2 encoder and the High Cut Frequency at say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	+3.0dB	Q=----

Once in the Lo-Shelv_1/2 Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM2" encoders for editing the Filter's High Cut Frequency and Gain:

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

"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 "PM2" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Lo_Shelv_Q Filter: These Symmetrical Shelving filters present ½ level of the selected Gain/Attenuation at the selected cutting frequency, and a slope depending from the chosen Q value.

If we selected a Low Shelving filter with variable Q within EQ-1, then the GAIN has to be set at a desired value of say +3dB using the PM2 encoder, the Q at 3.5 using the PM3 and the Hi Cut Frequency at say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	+3.0dB	Q= 3.5

Once in the Lo-Shelv_Q 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, Gain and Q:

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

"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 "PM2" encoder.

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Low Pass_1/2 Filter: These Low Pass filters present -3dB at the selected cutting frequency, and a slope of 6dB/Oct-12dB/Oct.

If we selected a Low Pass filter of the 1st/2nd order within EQ-1, then High Cut Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	-----dB	Q=----

Once in the Low Pass_1/2 Filter's edit screen, the "NAV/PM1" encoder can be used for editing/modifying the Filter's High Cut Frequency:

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

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Low Pass_Q Filter: The Gain of these Low Pass filters can be modified at their cutting frequency corner depending from the value assigned to the Q parameter.

If we selected a Low Pass filter with variable Q within EQ-1, then High Cut Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder and the Q at 3.5 using the PM3 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	-----dB	Q= 3.5

Once in the Low Pass_Q Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM3" encoders for editing the Filter's High Cut Frequency and Q:

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

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

High Pass_1/2 Filter: These High Pass filters present -3dB at the selected cutting frequency, and a slope of 6dB/Oct-12dB/Oct.

If we selected a High Pass filter of the 1st/2nd order within EQ-1, then Low Cut Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	-----dB	Q=----

Once in the High Pass_1/2 Filter's edit screen, the "NAV/PM1" encoder can be used for editing/modifying the Filter's Low Cut Frequency:

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

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

High Pass_Q Filter: The Gain of these High Pass filters can be modified at their cutting frequency corner depending from the value assigned to the Q parameter.

If we selected a High Pass filter with variable Q within EQ-1, then Low Cut Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder and the Q at 3.5 using the PM3 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	-----dB	Q= 3.5

Once in the High Pass_Q Filter's edit screen all the filter's parameters can be modified using the "NAV/PM1" and "PM3" encoders for editing the Filter's Low Cut Frequency and Q:

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

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

All Pass_1 Filter: Filters allowing a FLAT Amplitude response and adding a 90 Degree Phase rotation at the selected Frequency.

If we selected a All Pass filter of the 1st order within EQ-1, then Phase Rotation Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	-----dB	Q=----

Once in the All Pass_1 Filter's edit screen, the "NAV/PM1" encoder can be used for editing/modifying the Filter's Phase Rotation Frequency:

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

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

All Pass_2 Filter: Filters allowing a FLAT Amplitude response and adding a 180 Degree Phase rotation at the selected Frequency.

If we selected a All Pass_2 filter, with variable Q, within EQ-1, then Phase Rotation Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder and the Q at 3.5 using the PM3 encoder; the EQ sub-menu screen will show the following:

Input-A	CD – X	EQ-1
->1000Hz	-----dB	Q= 3.5

Once in the All Pass_2 Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM3" encoders for editing the Filter's Phase Rotation Frequency and Q:

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

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD – X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Band Pass Filter: Filters allowing to pass the band "around" the selected frequency; the amount of passing band is decided by the Q value

If we selected a Band Pass filter within EQ-1, then the Q has to be set at a desired value of say 1.00 using the PM3 encoder, the GAIN at say +3dB using the PM2 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	CD - X	EQ-1
->1.00kHz	+3.0dB	Q=1.00

Once in the Band Pass 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, Gain and Q:

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

"Gain": the selectable Gain range is from -15dB to +15dB in steps of 0.5 dB and can be adjusted by rotating the "PM2" encoder.

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD - X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Notch Filt Filter: Filters canceling the band "around" the selected frequency; the amount of canceled band is decided by the Q value

If we selected a Notch Filt filter within EQ-1, then the Q has to be set at a desired value of say 1.00 using the PM3 encoder and the Notch Frequency at say 1.00KHz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Input-A	CD - X	EQ-1
->1.00kHz	-----dB	Q=1.00

Once in the Notch Filt Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM3" encoders for editing the Filter's Notch Frequency and Q:

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

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Input-A	CD - X	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

- **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" or "5" or "6" 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.

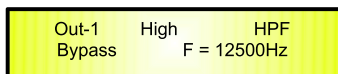
For parameter editing it is necessary to press ENTER and an arrow will appear on the left of the screen "->". Then use the "PM2" and "PM3" encoders for selecting and setting the parameter values. On some parameters that have three independent values, you will also need to use the NAV/PM1 encoder, for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

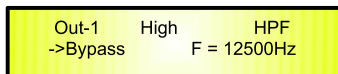
Audio Signal Output (1/2/3/4) Path Block Scheme



HPF sub-menu – from this sub-menu it is possible to set the Output Channels High Pass Filter. Once on the HPF page



Pressing the ENTER Button, the filter type fields and the Cutting frequency fields, become accessible for the filter's type selection and the Cutting Frequency "fine" setting



The available shapes and orders for the High Pass Filter, that are accessible by rotating the "PM2" encoder, are listed below:

- **Bypass** (High Pass Filter Bypassed)
- **Buttw_1st** (Butterworth Filter 6dB/Oct Slope)
- **Buttw_2nd** (Butterworth Filter 12dB/Oct Slope)
- **LRiley_2nd** (Linkwitz/Riley Filter 12dB/Oct Slope)
- **Bessel_2nd** (Bessel Filter 12dB/Oct Slope)
- **Buttw_3rd** (Butterworth Filter 18dB/Oct Slope)
- **Buttw_4th** (Butterworth Filter 24dB/Oct Slope)
- **LRiley_4th** (Linkwitz/Riley Filter 24dB/Oct Slope)
- **Bessel_4th** (Bessel Filter 24dB/Oct Slope)
- **Custom_2nd** (IInd Order Filter Cell with editable Cutting Frequency and Q)
- **Custom_3rd** (Cascade of 2 IInd Order Filter Cells with editable Cutting Frequency on both and Q on the second one)
- **Custom_4th** (Cascade of 2 IInd Order Filter Cells with editable Cutting Frequency and Q on both of them)

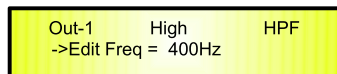
HPF sub-menu [Standard Filters]– from the sub-menu page, using the PM2 encoder, it is possible to set the HPF in **Bypass** or as one of the 8 Standard Filters: *Buttw_1st*, *Buttw_2nd*, *LRiley_2nd*, *Bessel_2nd*, *Buttw_3rd*, *Buttw_4th*, *LRiley_4th*, *Bessel_4th*.

The following is an example of a HPF sub-menu screen with the filter set at 400Hz as 24dB Linkwitz/Riley on Output1... using the name "High" (see later for assigning a Name to the outputs):



The filter's Frequency can be set already within this editing page using the PM3 encoder, but here is for Frequency "fine tuning" being the Frequency increment/decrement done by 1Hz steps.

For a quick Low Cut Frequency setting, need to press the ENTER Button for accessing the **Low Cut Frequency Fast Setting** Page.



"Low Cut Frequency": the selectable frequencies range is from 20Hz to 20kHz.

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

HPF sub-menu [Custom Filters]– from the sub-menu page, using the PM2 encoder, it is also possible to set the HPF as "Custom Filter", where this means that the HPF is built as cascade of IInd Order Cells, which number is depending from the filter's order and where for each Cell can be set independently the Low Cut frequency and the Q.

More precisely, the available independent parameters for setting are the following:

1. Customm_2nd: builded using 1 IInd order Cell, where Low Cut Frequency and Q can be set
2. Customm_3rd: builded using 2 IInd order Cell, where Low Cut Frequency can be set on both the cascaded Cells and the Q on the second one
3. Customm_4th: builded using 2 IInd order Cell, where Low Cut Frequency and the Q be set on both the cascaded Cells.

The following is an example of a HPF sub-menu screen with the filter set at 400Hz as Custom_4th on Output1... using the name "High" (see later for assigning a Name to the outputs):



From this Page, to access the cascaded IInd order Cells, it is necessary to rotate the NAV/PM1 encoder Clockwise or Counterclockwise.

The number of accessible IInd order Cells is depending from the Custom Filter order: Custom_2nd will allow the editing of just one IInd order Cell, Custom_3rd and Custom_4th, the access to 2 IInd order Cells.

In the previous example, rotating Clockwise the NAV/PM1 encoder, we can access the Filt1 (Cell1) and Filt2 (Cell2) pages, for the Cells Low Cut Frequency and Q settings.
When within the Filt1 editing Page, in example:

Out-1	High	HPF
->Filt1	F = 400Hz	Q = 0.7

And we can chose a different setting within the Filt2 page:

Out-1	High	HPF
->Filt2	F = 400Hz	Q = 1.5

The filter's Frequency can be set already within these editing pages using the PM2 encoder, but here is for Frequency "fine tuning" being the Frequency increment/decrement done by 1Hz steps.
For a quick Low Cut Frequency setting, need to press the ENTER Button for accessing the **Low Cut Frequency Fast Setting** Page.

Out-1	High	HPF
->Edit Freq	= 400Hz	

"Low Cut Frequency": the selectable frequencies range is from 20Hz to 20kHz.
Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

LPF sub-menu – from this sub-menu it is possible to set the Output Channels Low Pass Filter. Once on the LPF page

Out-1	Low	LPF
Bypass		F = 12500Hz

Pressing the ENTER Button, the filter type fields and the Cutting frequency fields, become accessible for the filter's type selection and the Cutting Frequency "fine" setting

Out-1	Low	LPF
->Bypass		F = 12500Hz

The available shapes and orders for the Low Pass Filter, that are accessible by rotating the "PM2" encoder, are listed below:

- **Bypass** (Low Pass Filter Bypassed)
- **Buttw_1st** (Butterworth Filter 6dB/Oct Slope)
- **Buttw_2nd** (Butterworth Filter 12dB/Oct Slope)
- **LRiley_2nd** (Linkwitz/Riley Filter 12dB/Oct Slope)
- **Bessel_2nd** (Bessel Filter 12dB/Oct Slope)
- **Buttw_3rd** (Butterworth Filter 18dB/Oct Slope)
- **Buttw_4th** (Butterworth Filter 24dB/Oct Slope)
- **LRiley_4th** (Linkwitz/Riley Filter 24dB/Oct Slope)
- **Bessel_4th** (Bessel Filter 24dB/Oct Slope)
- **Custom_2nd** (IInd Order Filter Cell with editable Cutting Frequency and Q)
- **Custom_3rd** (Cascade of 2 IInd Order Filter Cells with editable Cutting Frequency on both and Q on the second one)
- **Custom_4th** (Cascade of 2 IInd Order Filter Cells with editable Cutting Frequency and Q on both of them)

LPF sub-menu [Standard Filters]– from the sub-menu page, using the PM2 encoder, it is possible to set the LPF in **Bypass** or as one of the 8 Standard Filters: *Buttw_1st*, *Buttw_2nd*, *LRiley_2nd*, *Bessel_2nd*, *Buttw_3rd*, *Buttw_4th*, *LRiley_4th*, *Bessel_4th*.

The following is an example of a LPF sub-menu screen with the filter set at 400Hz as 24dB Linkwitz/Riley on Output1... using the name "Low" (see later for assigning a Name to the outputs):

Out-1	Low	LPF
->LRiley_4th		F = 400Hz

The filter's Frequency can be set already within this editing page using the PM3 encoder, but here is for Frequency "fine tuning" being the Frequency increment/decrement done by 1Hz steps.

For a quick High Cut Frequency setting, need to press the ENTER Button for accessing the **High Cut Frequency Fast Setting** Page.

Out-1	Low	LPF
->Edit Freq = 400Hz		

"High Cut Frequency": the selectable frequencies range is from 20Hz to 20kHz.

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

LPF sub-menu [Custom Filters]– from the sub-menu page, using the PM2 encoder, it is also possible to set the LPF as "Custom Filter", where this means that the LPF is build as cascade of IInd Order Cells, which number is depending from the filter's order and where for each Cell can be set independently the High Cut

frequency and the Q.

More precisely, the available independent parameters for setting are the following:

1. Customm_2nd: builded using 1 IInd order Cell, where High Cut Frequency and Q can be set
2. Customm_3rd: builded using 2 IInd order Cell, where High Cut Frequency can be set on both the cascaded Cells and the Q on the second one
3. Customm_4th: builded using 2 IInd order Cell, where High Cut Frequency and the Q be set on both the cascaded Cells.

The following is an example of a LPF sub-menu screen with the filter set at 400Hz as Custom_4th on Output1... using the name "Low" (see later for assigning a Name to the outputs):

Out-1	Low	LPF
->Custom_4th	F = 400Hz	

From this Page, to access the cascaded IInd order Cells, it is necessary to rotate the NAV/PM1 encoder Clockwise or Counterclockwise.

The number of accessible IInd order Cells is depending from the Custom Filter order: Custom_2nd will allow the editing of just one IInd order Cell, Custom_3rd and Custom_4th, the access to 2 IInd order Cells.

In the previous example, rotating Clockwise the NAV/PM1 encoder, we can access the Filt1 (Cell1) and Filt2 (Cell2) pages, for the Cells High Cut Frequency and Q settings.

When within the Filt1 editing Page, in example:

Out-1	Low	LPF
->Filt1	F = 400Hz	Q = 0.7

And we can chose a different setting within the Filt2 page:

Out-1	Low	LPF
->Filt2	F = 400Hz	Q = 1.5

The filter's Frequency can be set already within these editing pages using the PM2 encoder, but here is for Frequency "fine tuning" being the Frequency increment/decrement done by 1Hz steps.

For a quick High Cut Frequency setting, need to press the ENTER Button for accessing the **High Cut Frequency Fast Setting** Page.

Out-1	Low	LPF
->Edit Freq	= 400Hz	

"High Cut Frequency": the selectable frequencies range is from 20Hz to 20kHz.

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Note1: once the desired options have been selected using the 2 encoders, they are automatically saved as current and stored in the DPA4448QRT system status once leaving the page.

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

EQ Byp page – from this sub-menu it is possible to Bypass or to make active the 5 Bands Equalizer placed on the Output Signal Path.

Out-1	Name	EQ Byp
Eq Bypass	= Off	

When Bypassed the 5 Bands Equalizer, its current setting will not be lost.

EQ: [x] sub-menu – from this sub-menu it is possible to set the Output Channels five available Multi-Type Filters.

Anyone of the 5 filters of the Eq can be selected choosingggggggg from the list of filter types shown already at the "Input Path" section [**Peaking_Eq, Hi-Shelv_1, Hi-Shelv_2, Hi-Shelv_Q, Lo-Shelv_1, Lo-Shelv_2, Lo-Shelv_Q, Low Pass_1, Low Pass_2, Low Pass_Q, High Pass_1, High Pass_2, High Pass_Q, All Pass_1, All Pass_2, Band Pass, Notch Filt**]

More, the DPA255Q-R Is giving the possibility to "Bypass" any single filter of the 5 available in the Equalizer section; Once in the editing page of the single filter, a "Byp" field is available for making the single filter active or not

Out-1	Name	EQ-X
Byp=Off	Type=Peaking_Eq	

Pushing the Enter Button, the above window will allow the access to the "Byp" and "Type" fields.

Out-1	Name	EQ-X
->Byp=Off	Type=Peaking_Eq	

Using the PM2 encoder, the selected Filter can be activated or bypassed.

The DPA4448QRT allows the user to select anyone of the filter's type listed above and assign them independently using the 5 available filters.

In order to select the filter's type, it is necessary to use the PM3 encoder, rotate it "clockwise" or "counter-clockwise" to select the desired filter.

So, in order to define the filter type for the filter number 1 ("x"=1), it is necessary from the above screen, to select the filter, which name will appear on the screen.

If selected a Peaking_Eq filter, then the display will be as follow:

Out-1	Name	EQ-1
->Byp=Off	Type=Peaking_Eq	

Once selected the desired Filter Type, its parameters can be accessed for editing just pressing again the ENTER Button.

Once pressed the ENTER Button, the editing page of the selected filter type will be accessed ONLY if the selected filter it is not set in Bypass mode.

Depending from the selected filter, the related parameters will be available for editing

Peaking_Eq Filter: Peaking filters are at constant Q, so with Q not depending from the selected Gain value. If we selected a Peaking_Eq filter within EQ-1, then the Q has to be set at a desired value of say 1.00 using the PM3 encoder, the GAIN at say +3dB using the PM2 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	+3.0dB	Q=1.00

Once in the Peaking_Eq 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, Gain and Q:

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

"Gain": the selectable Gain range is from -15dB to +15dB in steps of 0.5 dB and can be adjusted by rotating the "PM2" encoder.

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Hi_Shelv_1/2 Filter: These Shelving filters present 3dB less than the selected Gain, or 3dB more than the selected Attenuation, at the selected cutting frequency, and a slope of 6dB/Oct-12dB/Oct.

If we selected a High Shelving filter of the 1st/2nd order within EQ-1, then the GAIN has to be set at a desired value of say +3dB using the PM2 encoder and the Lo Cut Frequency at say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	+3.0dB	Q=----

Once in the Hi-Shelv_1/2 Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM2" encoders for editing the Filter's Low Cut Frequency and Gain:

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

"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 "PM2" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Hi_Shelv_Q Filter: These Symmetrical Shelving filters present ½ level of the selected Gain/Attenuation at the selected cutting frequency, and a slope that is depending from the chosen Q value.

If we selected a High Shelving filter with variable Q within EQ-1, then the GAIN has to be set at a desired value of say +3dB using the PM2 encoder, the Q at 3.5 and the Lo Cut Frequency at say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	+3.0dB	Q= 3.5

Once in the Hi-Shelv_Q 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, Gain and Q:

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

"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 "PM2" encoder.

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Lo_Shelv_1/2 Filter: These Shelving filters present 3dB less than the selected Gain, or 3dB more than the selected Attenuation, at the selected cutting frequency, and a slope of 6dB/Oct-12dB/Oct.

If we selected a Low Shelving filter of the 1st/2nd order within EQ-1, then the GAIN has to be set at a desired value of say +3dB using the PM2 encoder and the High Cut Frequency at say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	+3.0dB	Q=----

Once in the Lo-Shelv_1/2 Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM2" encoders for editing the Filter's High Cut Frequency and Gain:

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

"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 "PM2" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Lo_Shelv_Q Filter: These Symmetrical Shelving filters present 1/2 level of the selected Gain/Attenuation at the selected cutting frequency, and a slope depending from the chosen Q value.

If we selected a Low Shelving filter with variable Q within EQ-1, then the GAIN has to be set at a desired value of say +3dB using the PM2 encoder, the Q at 3.5 using the PM3 and the Hi Cut Frequency at say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

IOut-1	Name	EQ-1
->1000Hz	+3.0dB	Q= 3.5

Once in the Lo-Shelv_Q 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, Gain and Q:

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

"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 "PM2" encoder.

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3"

encoder.
When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Low Pass_1/2 Filter: These Low Pass filters present -3dB at the selected cutting frequency, and a slope of 6dB/Oct-12dB/Oct.

If we selected a Low Pass filter of the 1st/2nd order within EQ-1, then High Cut Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	-----dB	Q=----

Once in the Low Pass_1/2 Filter's edit screen, the "NAV/PM1" encoder can be used for editing/modifying the Filter's High Cut Frequency:

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

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Low Pass_Q Filter: The Gain of these Low Pass filters can be modified at their cutting frequency corner depending from the value assigned to the Q parameter.

If we selected a Low Pass filter with variable Q within EQ-1, then High Cut Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder and the Q at 3.5 using the PM3 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	-----dB	Q= 3.5

Once in the Low Pass_Q Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM3" encoders for editing the Filter's High Cut Frequency and Q:

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

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

High Pass_1/2 Filter: These High Pass filters present -3dB at the selected cutting frequency, and a slope of 6dB/Oct-12dB/Oct.

If we selected a High Pass filter of the 1st/2nd order within EQ-1, then Low Cut Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	-----dB	Q=----

Once in the High Pass_1/2 Filter's edit screen, the "NAV/PM1" encoder can be used for editing/modifying the Filter's Low Cut Frequency:

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

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

High Pass_Q Filter: The Gain of these High Pass filters can be modified at their cutting frequency corner depending from the value assigned to the Q parameter.

If we selected a High Pass filter with variable Q within EQ-1, then Low Cut Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder and the Q at 3.5 using the PM3 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	-----dB	Q= 3.5

Once in the High Pass_Q Filter's edit screen all the filter's parameters can be modified using the "NAV/PM1" and "PM3" encoders for editing the Filter's Low Cut Frequency and Q:

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

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

All Pass_1 Filter: Filters allowing a FLAT Amplitude response and adding a 90 Degree Phase rotation at the selected Frequency.

If we selected a All Pass filter of the 1st order within EQ-1, then Phase Rotation Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	-----dB	Q=----

Once in the All Pass_1 Filter's edit screen, the "NAV/PM1" encoder can be used for editing/modifying the Filter's Phase Rotation Frequency:

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

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

All Pass_2 Filter: Filters allowing a FLAT Amplitude response and adding a 180 Degree Phase rotation at the selected Frequency.

If we selected a All Pass_2 filter, with variable Q, within EQ-1, then Phase Rotation Frequency has to be set at a desired value of say 1000Hz with the NAV/PM1 encoder and the Q at 3.5 using the PM3 encoder; the EQ sub-menu screen will show the following:

Out-1	Name	EQ-1
->1000Hz	-----dB	Q= 3.5

Once in the All Pass_2 Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM3" encoders for editing the Filter's Phase Rotation Frequency and Q:

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

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Band Pass Filter: Filters allowing to pass the band "around" the selected frequency; the amount of passing band is decided by the Q value

If we selected a Band Pass filter within EQ-1, then the Q has to be set at a desired value of say 1.00 using the PM3 encoder, the GAIN at say +3dB using the PM2 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	+3.0dB	Q=1.00

Once in the Band Pass 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, Gain and Q:

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

"Gain": the selectable Gain range is from -15dB to +15dB in steps of 0.5 dB and can be adjusted by rotating the "PM2" encoder.

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Notch Filt Filter: Filters canceling the band "around" the selected frequency; the amount of canceled band is decided by the Q value

If we selected a Notch Filt filter within EQ-1, then the Q has to be set at a desired value of say 1.00 using the PM3 encoder and the Notch 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	-----dB	Q=1.00

Once in the Notch Filt Filter's edit screen, all the filter's parameters can be modified using the "NAV/PM1" and "PM3" encoders for editing the Filter's Notch Frequency and Q:

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

"Q": the selectable Q range is from 0.3 up to 20.0 in steps of 0.1 and can be adjusted by rotating the "PM3" encoder.

When in the Parameters Editing Page, pushing once more the ENTER Button, it is possible to access the page of the **Frequency Fast Setting**:

Out-1	Name	EQ-1
->Edit Freq = 1000Hz		

Here, the NAV/PM1" encoder will increment/decrement the Frequency value by step of one thousand Hz, the PM2 by steps of one hundred Hz and the PM3 by steps of one Hz.

Note1: once the desired options have been selected using the 3 encoders, they are automatically saved as current and stored in the DPA4448QRT 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 "PM2" or "PM3" encoders.

The outputs' LED meters can show the Output signal LEVEL, the Output RMS Compressor's activity or the Output Peak Limiters' activity.

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

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

When the RMS Compressor's activity is selected, the LED meters will show, from top down, the activity of the RMS Compressor Limiter on the output

Out-1	Name	Vu-Meter
-> Vu-Meter = RMS Cmp Act		

When the Peak Limiter's activity is selected, the LED meters will show, from top down, the activity of the Peak Limiter on the output

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

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 any Output Channel and the level of signal for each Input, from OFF to 0dB by 1dB steps:

1. A = OFF, -30dB..., 0dB
2. B = OFF, -30dB..., 0dB
3. C = OFF, -30dB..., 0dB
4. D = OFF, -30dB..., 0dB

After selecting the Source page, a 4 channel mixer allows you to mix the 4 inputs of the DPA440A and to assign the mixed signal to the Output.

The following "Source" example screen shows the four inputs assigned with different signal levels to Output Channel 1:

Out-1	Name	Source
-> A=OFF B=-8 C=-3 D=0dB		

After pressing ENTER an arrow will appear on the left of the screen "->" the Input can be selected by rotating the NAV/PAR1 encoder and the Input channel amount 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 “PM2” or “PM3” 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

RMS Cmp sub-menu [1/2] – from this page it is possible to set the Threshold and Ratio parameters of the Output Channels RMS Compressor. The following is an example screen for the RMS Compressor [1/2] page where the Threshold of the RMS Compressor is set at +5dBu and the Ratio at 2:1

Out-1	Name	RMS Cmp
Thr: +5dBu		Rto: 2:1

Once pushing ENTER the RMS Compressor's parameters can be modified using the “PM2” and “PM3” encoders for editing the Threshold and the Ratio.

Once pushing ENTER the above screen will change as follows:

Out-1	Name	RMS Cmp
->Thr: +5dBu		Rto: 2:1

As said, the Threshold and Ratio can be edited using the “PM2” and “PM3” encoders.

“Threshold”: the selectable range of the RMS Compressor's Threshold is from +20dBu (OFF) to -10dBu in steps of 0.2dBu

The Threshold can be adjusted by rotating the “PM2” encoder.

“Ratio”: the selectable range of the RMS Compressor's Ratio is from 1:1 (Off) up to 32:1 (Lim) in steps of 1 and can be adjusted by rotating the “PM3” encoder.

Note: The RMS Compressor Threshold is defined in dBu, due to the fact that with both, Sinusoid and Squared wave testing signals, the DPA4448QRT compressed output dBu (RMS) Level is the same and matching the selected one.

RMS Cmp sub-menu [2/2] – from this page it is possible to set the Attack Time. Release Time and “Knee” type of the Output Channels RMS Compressor.

The following is an example screen for the Limiter page where the Attack Time of the RMS Compressor is set at 5ms, the Release Time is set at 0.2Sec and the Knee type is at the 50% between the HARD (000%) and the SOFT (100%) one:

Out-1	Name	RMS Cmp
A: 5ms	R: 0.2s	Kn=50%

Once pushing ENTER the RMS Compressor's parameters can be modified using the “NAV/PM1”, “PM2” and “PM3” encoders for editing the RMS Compressor's Attack Time [A]., Release Time [R] and Knee type.

Once pushing ENTER the above screen will change as follows:

Out-1	Name	RMS Cmp
->A: 5ms	R: 0.2s	Kn=50%

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

“Attack Time [A]”: the selectable range of the RMS Compressor'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 RMS Compressor's Release Time is from 0.1s to 3s in steps of 0.1s and can be adjusted by rotating the “PM2” encoder.

“Hard/Soft Knee”: the selectable range of the RMS Compressor's Knee type is from 000% (Hard) up to 100% (Soft) and can be adjusted by rotating the “PM3” encoder.

Peak Limiter sub-menu – from this page it is possible to set the Output Channels Peak Limiter.

The following is an example screen for the Peak Limiter page where the Attack Time of the Peak Limiter is set at 5ms, the Release Time is set at 0.2Sec and the Peak Limiter Active Threshold is set at +15dB:

Out-1	Name	Limiter
A: 5ms	R: 0.2s	+15.0dB

Once pushing ENTER the Peak Limiter's parameters can be modified using the “NAV/PM1”, “PM2” and “PM3” encoders for editing the Peak 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	+15.0dB

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

“Attack Time [A]”: the selectable range of the Peak 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 Peak 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 Peak 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.

Note: The Peak limiter Threshold is defined in Vp, due to the fact that with both, Sinusoid and Squared wave testing signals, the DPA4448QRT Peak Limited output Vp (Peak-Peak) Level is the same and matching the selected one.

Note1: once the desired options have been selected using the 3 encoders, they are automatically saved as current and stored in the DPA4448QRT 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	= 160.1872mS

Polarity page – from this page it is possible to set the Output Channels Polarity, by using the "PM2" or "PM3" 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 DPA4448QRT 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 DPA4448QRT 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 we want to edit the limiter of the Output channels 1/2/4, we 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 2/4, 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 we 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 DPA4448QRT and return the device to the original factory setting, is available to the user.

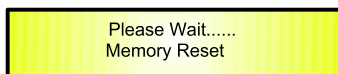
Note: Continuing with this process will mean the DPA4448QRT will re-initialize to the original factory settings and any previously stored information and changed parameters will be permanently lost.

Note1: Together with the all information, also the current password will be lost after a "Factory Reset" and will be replaced with the Factory one: "000000".

In case the customer forgot the password and need to reinitialize it, can use the "Factory Reset" to put the Password at its original "000000" value.

– Use the following procedure to perform the factory reset:

1. While the DPA4448QRT 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 DPA4448QRT:



3. Release the buttons and wait for the DPA4448QRT to re-initialize.

Once completed, the DPA4448QRT 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 LIFT switches

The DPA4448QRT on its back panel is providing a couple of switches allowing to connect or left unconnected the power Supply Main GND and the USB connectors GND to the chassis.

MAIN "LIFT/GND" Switch - Actually can happen that sometime 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 "LIFT/GND" Switch - When using a USB remote control connection, can be that the GND of the USB 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 switch.

On the other hand, if the GND of the USB 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 DPA4448QRT

- **USB Remote Control protocol for Presets Changing and Gain/Volume controls**

The following is the HEX Code for controlling the DPA4448QRT 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	C3H	XX	1BH	NPreset	00H	00H	00H	00H	00H	00H	00H	F7H

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

Npreset=0,...,23 Presetnumber

The DPA4448QRT'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	C3H	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	C3H	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, 6, 7).
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	C3H	XX	01H	Chn	00H	00H	00H	00H	00H	Phs	Vol	F7H

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

Chn=0,...,7: Channel selected, 0, 1=In1, In2; 2,...,7=Out1,...,Out6; when Channel 0, 1 selected, then Vol=Input Gain, when Channel 2, 3, 4, 5, 6, 7 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	C3H	XX	01H	Chn	00H	00H	00H	00H	00H	Phs	Vol	F7H

● **DPA4448QRT Technical Specifications**



The DPA4448QRT Digital Speaker Processor is based on a powerful analog and digital DSP platforms having the following specifications

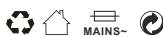
Analog Input Signal:	ChA/ChB/ChC/ChD	Bal. Female XLR
Maximum Input Level:	+20dBu	
Analog Output Signal:	Ch1/Ch2/Ch3/Ch4	Bal. Male XLR
Maximum Output Level:	+20dBu	
Digital Processing (DSP):	SAM3716, 24bits (data) x 96 bits (coeff.)	
A/D Converters:	AKM5392, 24bits	
D/A Converters:	AKM4396, 24bits	
Sampling Frequency:	48kHz	
S/PDIF Stereo Digital Input:	32kHz, 44.1kHz and 48kHz Sources Accepted	
S/N:	110dB	
THD+N:	0.005%	
Frequency Response (Bypass):	20Hz – 20kHz (+ - 1 dB)	
Power Supply:	Switching Power Supply	
Remote Control:	USB, TCP/IP	

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