DSP Series

DSP306USB
DSP408USB

Firmware v9.xx
Software DSPLink v9.xx

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Nov 10
User Manual

ENGLISH

CAUTION

RISK OF ELECTRIC SHOCK
DON'T OPEN

WARNING:
To reduce the risk of fire or electric shock do not expose this equipment to rain or moisture

Safety Instructions

1. READ THESE INSTRUCTIONS
All the safety and operating instructions should be read before the product is operated.

2. KEEP THESE INSTRUCTIONS
The safety and operating instructions should be retained for future reference.

3. HEED ALL WARNINGS
All warnings on the product and in the operating instructions should be adhered to.

4. FOLLOW ALL INSTRUCTIONS
All operating and use of instructions should be followed.

5. DO NOT USE THIS APPARATUS NEAR WATER
Do not use the product near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.

6. CLEAN ONLY WITH DRY CLOTH
Unplug the unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

7. DO NOT BLOCK ANY VENTILATION OPENINGS
Slots and openings in the cabinet back or bottom are provided for ventilation, to ensure reliable operation of the limit and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or similar surface. This product should never be placed near or over a radiator or heat source. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacture's instructions have been adhered to.

8. DO NOT INSTALL NEAR ANY HEAT SOURCES
This Product should be situated away from heat sources such as radiators, stoves, or other products (including amplifiers) that produces heat.

9. DO NOT DEFEAT THE SAFETY PURPOSE OF THE POLARIZED OR GROUNDING-TYPE PLUG
A Polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prongs are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. PROTECT THE POWER CORD FROM BEING WALKED ON OR PINCHED PARTICULARLY AT PLUGS, CONVENIENCE RECEPTACLES, AND THE POINT WHERE THEY EXIT FROM THE APPARATUS.

11. ONLY USE ATTACHMENTS/ ACCESSORIES SPECIFIED BY THE MANUFACTURER.

12. UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.
For added protection for this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.

13. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL. SERVICING IS REQUIRED WHEN THE APPARATUS HAS BEEN DAMAGED IN ANYWAY, SUCH AS WHEN THE POWER SUPPLY CORD OR PLUG IS DAMAGED, LIQUID HAS BEEN SPILLED OR OBJECTS HAVE FALLEN INTO THE APPARATUS, THE APPARATUS HAS BEEN EXPOSED TO RAIN OR MOISTURE, DOES NOT OPERATE NORMALLY, OR HAS BEEN FROPPED.

14. WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

15. APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

1.INTRODUCTION

The DSP**306/408** USB is a complete digital loudspeaker management system designed for the touring or fixed sound installation markets. The absolute latest in available technology is utilized with 40-bit floating point processors and high performance 24-bit Analogue Converters. The high-bit DSP prevents noise and distortion induced by truncation errors of the commonly used 24-bit fixed-point devices. A complete set of parameters include I/O levels, delay, polarity, 8 bands of parametric EQ per channel, 31 bands of graphic EQ per input, multiple crossover selections and full function limiters. Precise frequency control is achieved with its 1 Hz resolution. Inputs and outputs can be routed in multiple configurations to meet any requirements.

The DSP**306/408** USB can be controlled or configured in real time on the front panel or with the intuitive PC GUI accessed via the USB interface (or optionally Ethernet). Software upgrade for CPU and DSP via PC keeps the device current with newly developed algorithms and functions once available.

Multiple setup storage and system security complete this professional package.

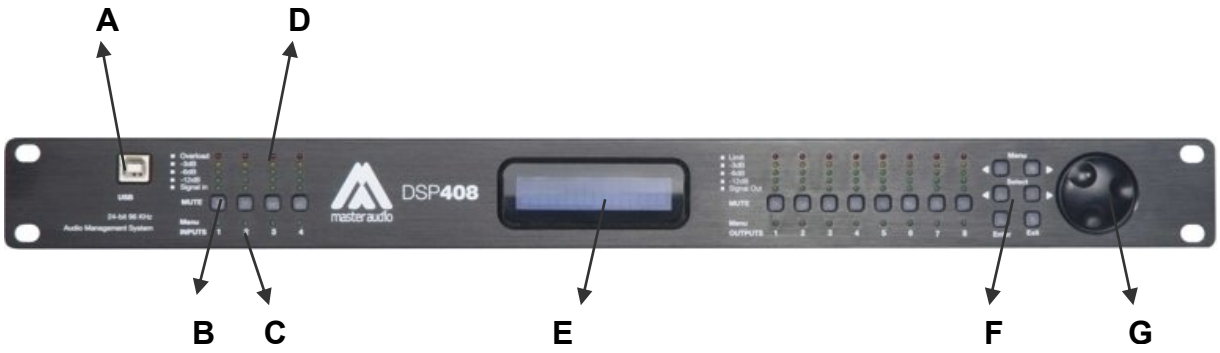
Shipped contents:

- DSP**306/408** USB unit
- AC power cord
- USB cable for PC connection
- Pen Drive (USB) with software and User Manual

2.FEATURES

- 3 Inputs and 6 Outputs with flexible routing (DSP**306**USB)
- 4 Inputs and 8 Outputs with flexible routing (DSP**408**USB)
- 40-bit floating point DSP
- High Performance 24-bit A/D Converters
- 1 Hz Frequency Resolution
- 8 Parametric Equalizers for each Input and Output
- 31-band Graphic Equalizer for each Input
- Multiple Crossover types with Full Function Limiters
- Precise Level, Polarity and Delay
- CPU and DSP upgrade via PC
- 2-Line x 16 Character Blue Backlit LCD Display
- Full 5-segment LED's on every Input and Output
- Storage of up to 30 Program Setups
- Security Lock
- USB Interface for PC Control and Configuration
- Ethernet interface option available

3.THE FRONT PANEL



A) **USB Connector** – A standard type B USB connector for interface with a PC. Software and driver must be installed prior to usage.

B) **Mute keys** - Mute/Unmute input and output channels. When an input channel is muted, they key will light up in red for indication.

The Mute keys are also used to access the program of each channel in combination with the Menu> and <Menu keys. Holding one of the Menu keys and pressing the Mute key of the desired channel will give access to the channel parameters, and will be acknowledged by a green led below the mute key. Multiple channels can be linked or unlinked to ease the programming. Inputs and outputs are linked separately.

C) **Channel Menu LED** – Indicates the activated channels for parameter modification

D) **Peak Level LED** - Indicates the current peak level of the Signal: Signal, -12dB, -6dB, -3dB, Overload/Limit. The Input Overload LED references to the device's maximum headroom. The Output Limit LED references to the threshold of the limiter.

E) **LCD** - Shows all the necessary information to control the unit.

F) **Menu Control keys** - There are 6 menu keys: <*Menu* (Menu Down), *Menu*> (Menu Up), <*Select* (Cursor Down), *Select*> (Cursor Up), *Enter* and *Exit*. The functions of each key is explained below:

<*Menu*: Previous menu screen. In combination with the channel Mute key, the specific channel Menu is displayed.

Menu>: Next menu screen. In combination with the channel Mute key, the specific channel Menu is displayed.

<*Select*: Previous cursor in the menu screen

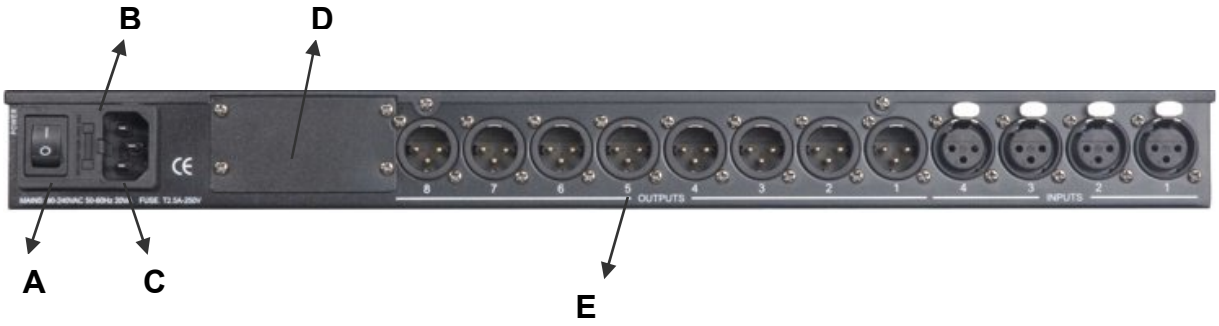
Select>: Next cursor in the menu screen

Enter: This key has three different functions depending on when it is used:
- In the System Menu is used to proceed with selected actions.
- In the Main Menu allows entering the System Menu.
- In delay and frequency adjustments (1 Hz resolution mode) modifies data values by 100X (used with thumb wheel).

Exit: Exit to the Main Menu

G) **Rotary Thumb Wheel** - Changes parameter data values. The wheel has travel velocity sensing which ease large incremental data modifications. For modifying delay and frequency (1 Hz resolution), pressing the Enter key simultaneously will increment/decrement the data value by 100X.

4.THE REAR PANEL



A) **Power switch** - Controls power On/Off.

B) **Main Fuse** - T200mA-250V. Slow blow type.

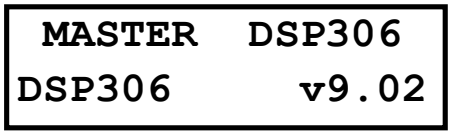
C) **Main Power** - Connects via a standard IEC socket. A compatible power cord is supplied with the unit. The voltage input is 90-240VAC, 50-60Hz

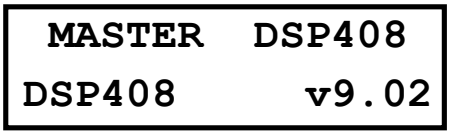
D) **Ethernet slot** – Slot to install the optional Ethernet module. With this accessory, the unit can be connected to a router, switch or PC through CAT-5 cable.

E) **XLR input and outputs** - Separate 3-pin XLR connectors are provided for each audio input and output. The device's output stage employs the balanced impedance topology. All I/O connectors have pin 1 as ground (shield), pin 2 as + and pin 3 as -.

5.POWER UP

After powering up the unit, the following initialization screen is displayed on the LCD:





The initialization process takes about 8 seconds and during that period the unit boots and displays the DSP**306** or DSP**408** firmware version.

After that, the DSP unit displays its main screen:

The screen shows the current program number and program name assigned to the unit. The program assigned is always the last program the user recalled or stored before powering down the unit. An asterisk (*) beside the program number means that the program has been modified but not stored.

Now the DSP unit is ready to operate.

6.OPERATING THE DEVICE

6.1.Input Menus

To access the Input Menus, hold the <Menu or Menu> key and press the Mute key of the desired channel. The green led below the Mute key will light up. More than one input channel may be selected by holding the Menu key and pressing the corresponding Mute key. Press Exit to deselect all.

The following menus are available for each input channel:

6.1.1. Signal - Signal parameters

• **LEVEL** - Gain, -40.00dB to +15.00dB in 0.25dB steps.

```
I1:_____ Signal
LEVEL:0.00dB
```

• **POL** - Polarity, can be normal (+) or inverted (-).

```
I1:_____ Signal
POL:+
```

• **DELAY** - Delay in 11us steps. It can be displayed in ms, ft or m. The time unit of the delay can be changed in the System menu. The maximum delay permitted is 650ms.

```
I1:_____ Signal
DELAY:000.000ms
```

6.1.2.EQ - EQ parameters

• **EQ#** - Selects one of the 8 available Equalizers.

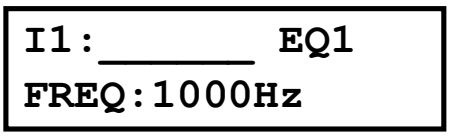
```
I1:_____ EQ1
EQ#:1
```

• **BYPASS** – When set On, the currently selected EQ will be bypassed.

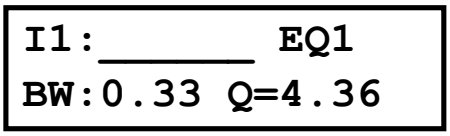
```
I1:_____ EQ1
BYPASS:Off
```

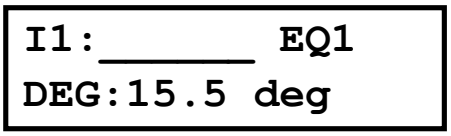
• **TYPE** - Type of EQ. The types can be parametric (PEQ), Lo-shelf (LO-SHF), Hi-shelf (HI-SHF), 1st degree all-pass (AP-1) and 2nd degree all-pass (AP-2).

• **FREQ** - EQ center frequency. Ranges from 20 to 20,000Hz in either 1Hz steps or 1/36 octave steps. The frequency steps can be selected in the System Menu.

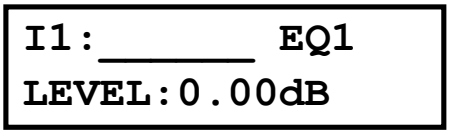


• **BW** - EQ Bandwidth. Ranges from 0.02 to 3.61 octaves, in steps of 0.01 octave steps for PEQ, LO/HI-SHF and AP-2. For AP-1, the bandwidth sets the phase shift at the centre frequency. This phase is gradually changed from 180 degrees above the centre frequency to the specified value.



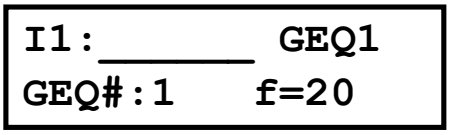


• **LEVEL** - EQ level gain. Ranges from -30.00dB to +15.00dB in 0.25dB steps.

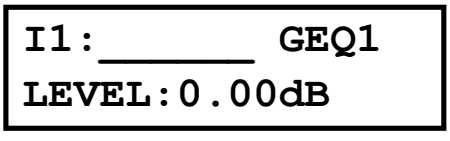


6.1.3. Input Graphic Equalizer

• **GEQ#** - Selects one of the 31 available bands, from 20Hz to 20kHz. The selected frequency is shown.



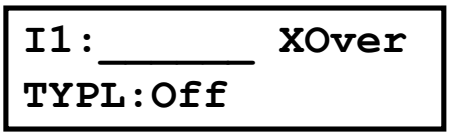
• **LEVEL** - GEQ level gain. Ranges from -30.00dB to +15.00dB in 0.25dB steps.



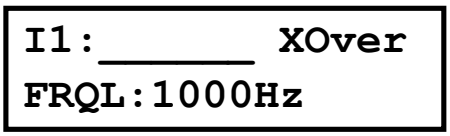
• **BYPASS** – When set On, the currently selected GEQ will be bypassed.

6.1.4.Crossover

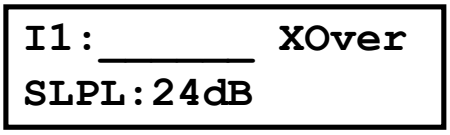
• **TYPL** - Filter Type of low frequency crossover point (high pass). Types can be Butterworth, Linkwitz-Riley or Bessel.



• **FRQL** - Filter cut-off Frequency of low frequency crossover point (high pass). Ranges from 20Hz to 30kHz in either 1Hz steps or 1/36 octave steps. The frequency steps can be selected in the System Menu.

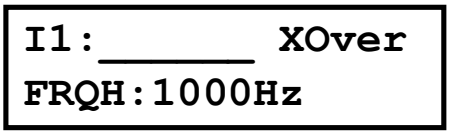


• **SLPL** - Filter Slope of low frequency crossover point (high pass). Ranges from 6 to 48dB/octave. If the selected Filter Type is Linkwitz-Riley, the available slopes are 12 / 24 / 36 / 48 dB/octave.



• **TYPH** - Filter Type of high frequency crossover point (low pass). Same types as for high pass filters are available: Butterworth, Linkwitz-Riley and Bessel.

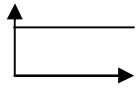
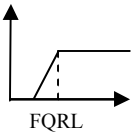
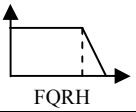
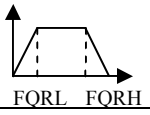
• **FRQH** - Filter cut-off frequency of high frequency crossover point (low pass).



• **SLPH** - Filter Slope of high frequency crossover point (low pass).

```
I1:_______ XOver
SLPH:24dB
```

The following table summarizes all possible crossover configurations:

Filter config.	Low Xover point	High Xover point	
None	TYPL Off	TYPH Off	
Highpass	TYPL not Off	TYPH Off	
Lowpass	TYPL Off	TYPH not Off	
Bandpass	TYPL not Off	TYPH not Off	

6.1.5.Comp – Dynamics Compressor

• **THRESH** - Compressor Threshold. Ranges from -20 to +20dBu in 0.5dB steps.

```
I1:_______ Comp
THRESH:0.0dBu
```

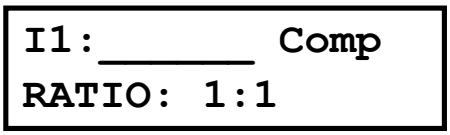
• **ATTACK** - Attack time. Ranges from 0.3 to 1ms in 0.1ms steps, then ranges from 1 to 100ms in 1ms steps.

```
I1:_______ Comp
ATTACK:10ms
```

• **RELEASE** - Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.

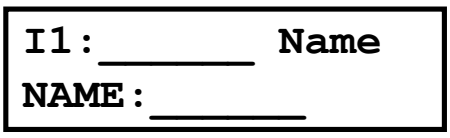
```
I1:_______ Comp
RELEASE:8xAtck
```

• **RATIO** – The compressor ratio determines the slope in which the signal is compressed. Ranges from 1:1 (no compression) to 1:40 are available.



6.1.6.Name - Channel Name

• **NAME** - Channel name. It is 6 characters in length.



6.2.Output Menus

To access the Output Menus, hold the <Menu or Menu> key and press the Mute key of the desired channel. The green led below the Mute key will light up. More than one output channel may be selected by holding the Menu key and pressing the corresponding Mute key. Press Exit to deselect all.

The following menus are available for each ouput channel:

6.2.1.Signal - Signal parameters

• Refer to the Input Menus for details

6.2.2.EQ - EQ parameters

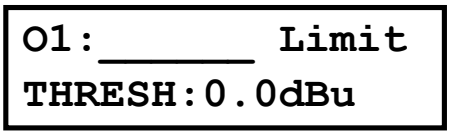
• Refer to the Input Menus for details

6.2.3.XOver - Crossover parameters

• Refer to the Input Menus for details

6.2.4.Limit - Output Limiter

• **THRESH** - Limiter Threshold. Ranges from -20 to +20dBu in 0.5dB steps.



• **ATTACK** - Attack time. Ranges from 0.3 to 1ms in 0.1ms steps, then ranges from 1 to 100ms in 1ms steps.

```
O1:_______ Limit
ATTACK:10ms
```

• **RELEASE** - Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.

```
O1:_______ Limit
RELEASE:8xAtck
```

6.2.5.Source - Input Source

• **1, 2, 3, 4** – Input channel source for the current output channel. It can be set to mix the input source (in dB) or disable it (Off). If more than one input source is enabled, they will be added together as the source for the current output channel.

```
O1:_______ Source
1:0.00
```

```
O1:_______ Source
2:-14.00
```

```
O1:_______ Source
3:Off
```

```
O1:_______ Source
4:Off
```

(Input #4 only available for DSP**408**)

6.2.6.Ch-Name - Channel Name

• Refer to the Input Menus for details

6.3.System Menu

The System Menu allows the user to control and change parameters that are related to the system behaviour and general operation. It can be accessed by pressing the *Enter* key in the main menu (when no Input/Output or System Menu is activated). All System Menus require the *Enter* key to be pressed for the selected action.

6.3.1.Recall - Program Recall

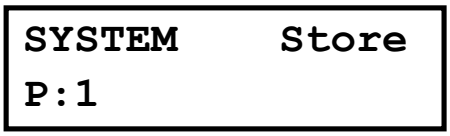
The DSP unit has a built-in non-volatile memory that can store up to 30 different program setups. A program can be recalled using this menu.

• **P:#** - Program Number to be recalled. Press *Enter* twice to confirm the operation.

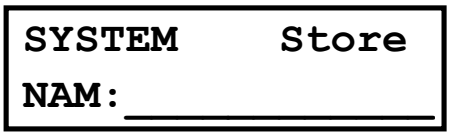
6.3.2.Store - Program store

A program can be stored using this menu. The old program with the same program number will be replaced. Once the program is stored in the flash memory, it can be recalled at a later time, even after power down.

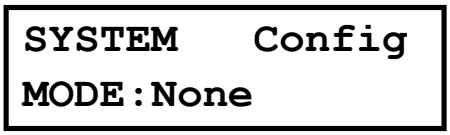
• **P:#** - Program Number for the current data to be stored.



• **NAM** - Program Name, allows a maximum length of 12 characters.



6.3.3.Config - Device Configuration



• **MODE** - configures the mode of operation. The possible modes are shown in the following table:

Mode	Out 1	Out 2	Out 3	Out 4	Out 5	Out 6	Out 7 (408 only)	Out 8 (408 only)
None	Any	Any	Any	Any	Any	Any	Any	Any
Stereo 2-Way	In1	In1	In2	In2	Any	Any	Any	Any
Stereo 3-Way	In1	In1	In1	In2	In2	In2	Any	Any
Stereo 4-Way (408 only)	In1	In1	In1	In1	In2	In2	In2	In2

The unit assigns the Input source for the corresponding outputs when the Mode of Configuration is selected. The crossover point parameters like the filter type, cut-off

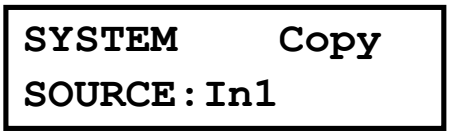
frequency and slope have to be configured manually in the Xover Menu in each Output menu.

Note: The configuration mode configures the input sources when selected. The user can change the source afterwards if desired. It does not keep the configuration in memory.

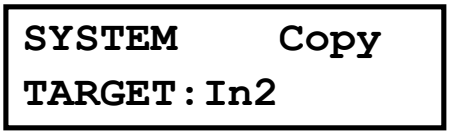
6.3.4.Copy - Copy channels

Copy Channels from the source to the target. When the Source and Targets are both Inputs and Outputs, all audio parameters will be copied. When one of the Source or the Target is an input while the other is an output, only the Level, Polarity, Delay and EQ are copied.

• **SOURCE** - Channel to be copied from.



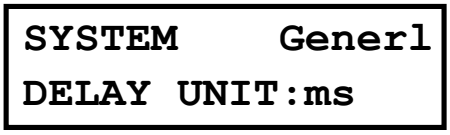
• **TARGET** - Channel to be copied to.



6.3.5.General - General system parameters

• **FREQ MODE** - Selects the frequency control mode for EQ and crossover filters. Can be 36 steps/octave or All Frequencies (1 Hz resolution).

• **DELAY UNIT** - ms, ft or m.



6.3.6.Comm – Communication Settings

• **BAUD RATE** – Sets the baud rate of serial communication. Default is 115200bps.

• **DEVICE ID** - Assigns the device an ID from 1 to 16. This ID is useful when a network of more than 1 unit is present.

```
SYSTEM     Comm
DEVICE ID:1
```

• **NETWORK ID** - Assigns the device an ID from 0 to 60000. This ID is used for future expansion only, please leave these value at 0.

```
SYSTEM     Comm
NETWORK ID:0
```

6.3.7.Passw – Security Password

The factory default password is blank "____", and it may be changed to any 4-character combination in this menu.

• **OLD PW** – The user is required to enter the old password first in order to modify it.

```
SYSTEM     Passwd
OLD PW:____
```

• **NEW PW** – The new password desired.

```
SYSTEM     Passwd
NEW PW:____
```

6.3.8.Secure – Front Panel Security Lock

The DSPSeries unit enables the user to secure the unit and prevent undesired changes in the setup by locking all the keys on the front panel. The unit password Is required to proceed with this action.

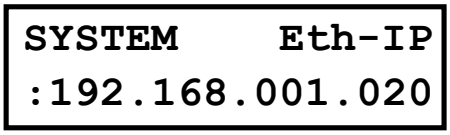
• **PASSWORD** – The user is required to enter the password to lock the unit.

```
SYSTEM     Secure
PASSWORD:____
```

All controls in front panel will be locked. To unlock the unit, press the *Enter* key and browse again to the System/Secure Menu. Enter the password again and confirm.

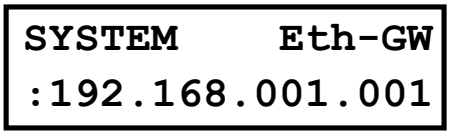
6.3.9.Eth-IP – Ethernet IP address

It determines the unique IP address on the unit in the network.
This parameter is only available when the Ethernet card accessory is installed.



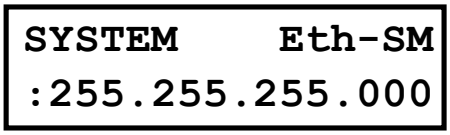
6.3.10.Eth-GW – Ethernet gateway

The gateway address of the network, usually the IP address of your router, switch or hub.
This parameter is only available when the Ethernet card accessory is installed



6.3.11.Eth-SM – Subnet mask

The subnet mask used by your network.
This parameter is only available when the Ethernet card accessory is installed



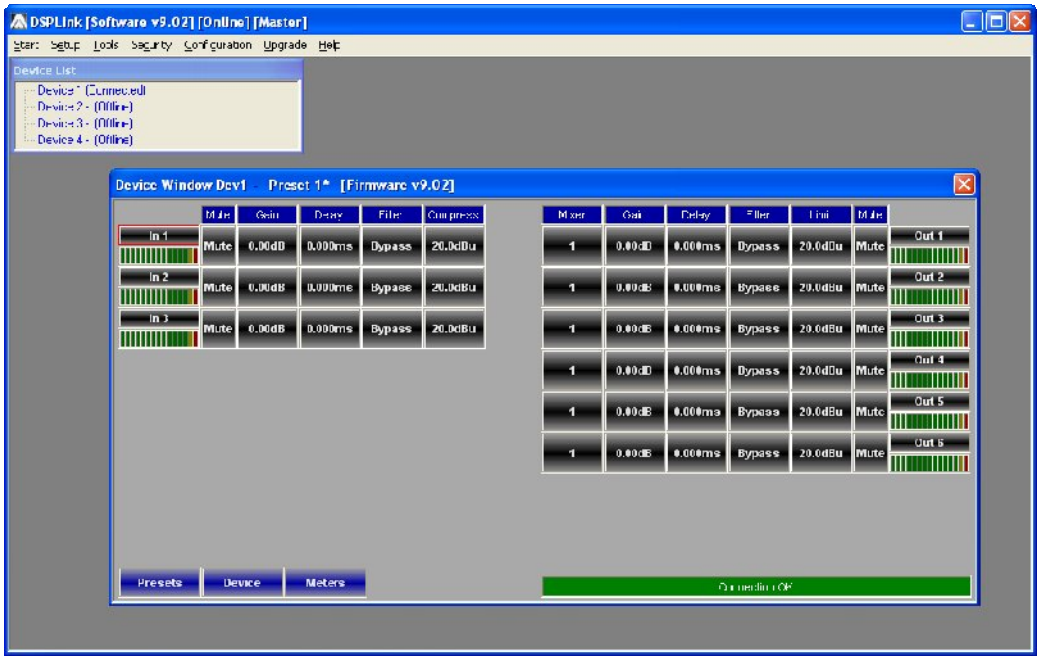
7.QUICK REFERENCE

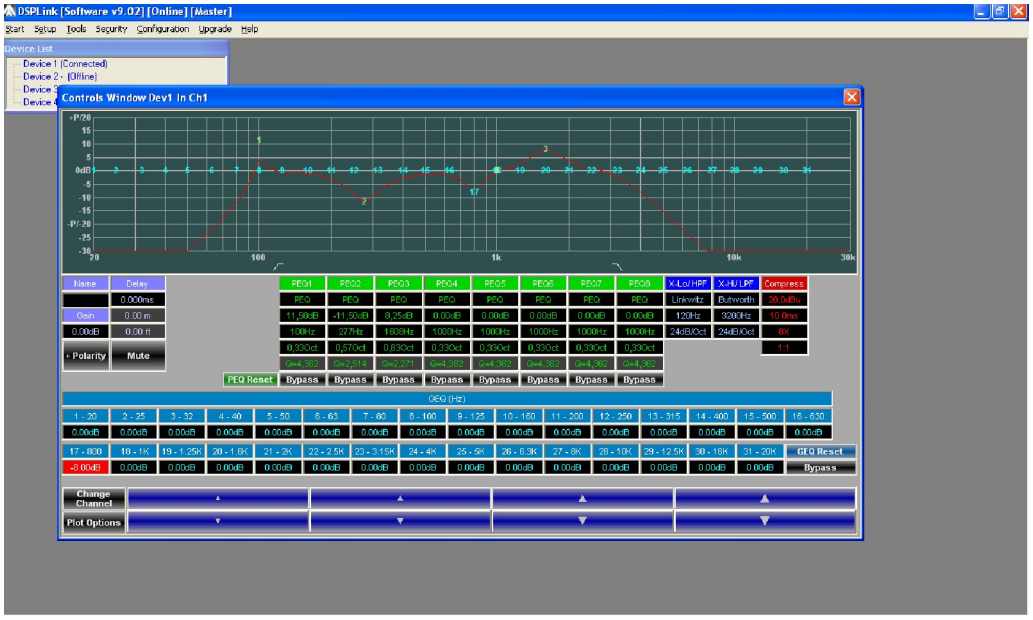
Parameters	Menu <Menu>	Field <Select>	Min	Max	Steps	Units
Level	Signal	LEVEL	-40	+15	0.25	dB
Polarity	Signal	POL	+ / -			
Delay	Signal	DELAY	0	62,400	1	11us steps
EQ Number	EQ	EQ#	1	8	1	
EQ Bypass	EQ	BYPASS	Off/On			
EQ Type	EQ	TYPE	PEQ / Lo-Shf / Hi-Shf / AP-1 / AP-2			
EQ Level	EQ	LEVEL	-30	+15	0.25	dB
EQ Frequency	EQ	FREQ	20	30k	1	Hz
EQ Bandwidth	EQ	BW	0.02	3.61	0.01	Octave
GEQ Number	GEQ	GEQ#	1	31	1	
GEQ Level	GEQ	LEVEL	-30	+15	0.25	dB
GEQ Bypass	GEQ	BYPASS	Off/On			
Xover Low Type	XOver	TYPL	Off / Butterworth / Linkwitz-Riley / Bessel			
Xover Low Freq.	XOver	FRQL	20	30k	1	Hz
Xover Low Slope	XOver	SLPL	6	48	6	dB/octave
Xover High Type	XOver	TYPH	Off / Butterworth / Linkwitz-Riley / Bessel			
Xover High Freq.	XOver	FRQH	20	30k	1	Hz
Xover High Slope	XOver	SLPH	6	48	6	dB/octave
Compressor Threshold	Comp	THRESH	-20	+20	0.5	dBu
Compressor Attack Time	Comp	ATTACK	0.3	100	0.1/1	ms
Compressor Release Time	Comp	RELEASE	2 / 4 / 8 / 16 / 32X Attack time			
Compressor Ratio	Comp	RATIO	1:1 to 1:40			
Limiter Threshold	Limit	THRESH	-20	+20	0.5	dBu
Limiter Attack Time	Limit	ATTACK	0.3	100	0.1/1	ms
Limiter Release Time	Limit	RELEASE	2 / 4 / 8 / 16 / 32X Attack time			
Source	Source	1 to 4	Off	+15	0,25	dB
Channel Name	Name	NAME	6 characters			

8.PC CONTROL SOFTWARE

The DSP units are shipped with a special PC Graphic User Interface (GUI) application - DSPLink. DSPLink gives the user an option to control the DSP unit from a remote PC via the USB communication link (or optionally through Ethernet with the optional Ethernet card). For the USB connection a driver must be installed (included with the DSPLink installation package). For the Ethernet connection, the IP address should be set as indicated in section 6.3.9 of this manual.

The GUI application makes it much easier to control and monitor the device, allowing the user to get the whole picture on one screen. Programs can be recalled and stored from/to PC's hard drive, thus expanding the storage to become virtually limitless.





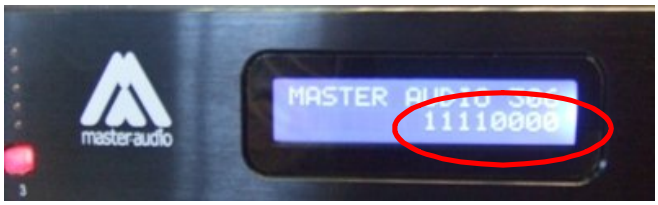
9.TROUBLESHOOTING

9.1.Password forgotten

In case you set up a lock password in the DSP unit and you don't remember it any more, please take the following steps:

A) Power on the device

B) During a few seconds, an 8-character code is shown in the LCD display. Write it down.



C) Send the code to export@master-audio.com

D) You will receive an answer with the unlock code as soon as your mail is processed.

10.SPECIFICATIONS

Inputs and Outputs

Input Impedance……..	>10 kOhms
Output Impedance……	50 Ohms
Maximum Level……..	+20 dBu
Type…….	Electronically balanced

Audio Performance

Frequency Response….	+/- 0.1dB (20Hz to 20kHz)
Dynamic Range……	115 dB typ. (unweighted)
CMMR……..	> 60 dB (50Hz to 10kHz)
Crosstalk……...	< -100 dB
Distortion……..	0.002% (1kHz@+4dBu)

Digital Audio Performance

Processor……...	40-bit
Sampling Rate……..	96 kHz
Analog Converters……	High Performance 24-bit
Propagation Delay……	1.5 ms

Front Panel Controls

Display…….	2 x 16 Character Backlit LCD
Level Meters…….	5 segment LED
Buttons……..	Mute Controls, Menu Controls
Dial Encoder…….	Embedded Thumb Wheel

Connectors

Audio……	3-pin XLR Pin 1: shield Pin 2: live (+) Pin 3: return (-)
USB…….. …	Type B
Ethernet…….	RJ-45 (optional)
Power……	Standard IEC Socket

General

Power……	90-240 VAC (50 / 60Hz)
Dimensions……...	483x44x203 mm
Weight……...	4.6kg

Audio Control Parameters

Gain……..	-40 to +15dB in 0.25dB steps
Polarity…….	+/-
Delay……	Up to 650ms per I/O

- Equalizers (8 per I/O) -

Type……..	Parametric, Hi-shelf, Lo-shelf, All pass 1st order, All-pass 2nd order
Gain……..	-30 to +15dB in 0.25dB steps
Bandwidth…….	0.02 to 3.61 octaves (Q=0.3 to 72)

- 31-band Graphic Equalizers (1 per Input) -
Gain…….. -30 to +15dB in 0.25dB steps

- Crossover Filters (2 per Input/Output) -
Filter Types…….. Butterworth, Bessel, Linkwitz-Riley
Slopes……... 6 to 48dB/oct

- Compressors (1 per Input) -
Threshold…….. -20 to +20dBu
Attack……..… 0.3 to 100ms
Release……. 2 to 32X the attack time
Ratio……. 1:1 to 1:40

- Limiters (1 per Output) -
Threshold…….. -20 to +20dBu
Attack……..… 0.3 to 100ms
Release……. 2 to 32X the attack time

System Parameters
No. of Programs…… 30
Program Names…… 12 character length
Delay Units……..… ms, ft, m
Frequency Modes……. 36 steps/oct, 1Hz resolution
Security Lock……. Lock/Unlock
Copy channels…….. All parameters
Channel Names……. 6 character length

Note: Specifications subject to change without notice