DSP**306**

Speaker Controller

Software v4.03a
Firmware v4.01

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User's Manual
November 2006

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** is a complete 3 input - 6 output digital loudspeaker management system designed for the touring or fixed sound installation markets. The absolute latest in available technology is utilized with 32-bit (40-bit extended) 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, 6 bands of parametric EQ per channel, 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** can be controlled or configured in real time on the front panel or with the intuitive PC GUI accessed via the RS-232 interface. 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** unit
- AC power cord
- DB9 cable for PC connection
- User Manual
- XLink Software CD

2.FEATURES

- 3 Inputs and 6 Outputs with flexible routing
- 32-bit (40-bit extended) floating point DSP
- High Performance 24-bit A/D Converters
- 1 Hz Frequency Resolution
- 6 Parametric Equalizers for each Input and Output
- 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
- RS-232 Interface for PC Control and Configuration
- Future options available

3.THE FRONT PANEL

1. **Mute keys** - Mute/Unmute input and output channels. When an input channel is muted, a red LED will come on for indication.

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

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

4. **Channel Edit keys** - Select the corresponding channel (Input or Output) for parameter edition. The last modified menu will be displayed on the LCD.

5. **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

   Menu>>: Next menu screen

   <<*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

6. **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

1. **Power switch** - Controls power On/Off.

2. **Main Fuse** - T200mA-250V. Slow blow type.

3. **Main Power** - Connects via a standard IEC socket. A compatible power cord is supplied with the unit.

4. **Voltage selection switch** - The voltage input can be selected between 115 and 230VAC by this switch.

5. **RS232** - a standard female DB9 socket. A straight through cable is required for PC connection.

6. **Option slot** - Option slot for future use.

7. **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:

```
MASTER AUDIO 306
             v4.01
```

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

After that, the DSP**306** displays its main screen:

```
MASTER AUDIO 306
P01 _____________
```

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.

Now the DSP**306** is ready to operate.

6.OPERATING THE DEVICE

6.1.Input Menus

To access the Input Menus, use the Channel Edit keys until the input channel to be modified (I1, I2 or I3) is displayed on the LCD. There are 3 menus 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 21us 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 2,400 steps (50ms).

```
I1:_______ Signal
DELAY:000.000ms
```

6.1.2.EQ - EQ parameters

• **EQ#** - Selects one of the 6 available Equalizers.

```
I1:_______ EQ
EQ#:1
```

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

```
I1:_______ EQ
LEVEL:0.00dB
```

• **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.

```
I1:_______ EQ
FREQ:1000Hz
```

• **BW** - EQ Bandwidth. Ranges from 0.02 to 2.50 octaves in steps of 0.01 octave steps for PEQ. The Q value is automatically shown beneath the octave value. For Lo-Slf or Hi-Shf, it is either 6 or 12dB/Oct.

```
I1:_______ EQ
BW:0.33 Q=4.36
```

• **TYPE** - Type of EQ. The types can be parametric (PEQ), Lo-shelf (Lo-shf) and Hi-shelf (Hi-shf).

```
I1:_______ EQ
TYPE:PEQ
```

6.1.3. Ch-Name - Channel Name

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

```
I1:_______ Name
NAME:_______
```

6.2.Output Menus

To access the Output Menus, use the Channel Edit keys until the output channel to be modified (O1 to O6) is displayed on the LCD. There are 6 menus for each output 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

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

```
O1:_______ XOver
FTRL:Off
```

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

```
O1:_______ XOver
FRQL:1000Hz
```

• **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.

```
O1:_______ XOver
SLPL:24dB
```

• **FTRH** - Filter Type of high frequency crossover point (low pass).

```
O1:_______ XOver
FTRH:Off
```

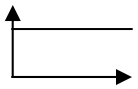
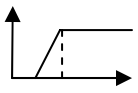
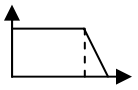
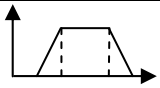
• **FRQH** - Filter cut-off frequency of high frequency crossover point (low pass).

```
O1:_______ XOver
FRQH:1000Hz
```

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

```
O1:_______ XOver
SLPH:24dB
```

The following table summarizes all possible crossover configurations:

Filter config.	Low Xover point	High Xover point	
None	FTRL Off	FTRH Off	
Highpass	FTRL not Off	FTRH Off	 FQRL
Lowpass	FTRL Off	FTRH not Off	 FQRH
Bandpass	FTRL not Off	FTRH not Off	 FQRL FQRH

6.2.4.Limit - Output Limiter

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

```
O1:_______ Limit
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.

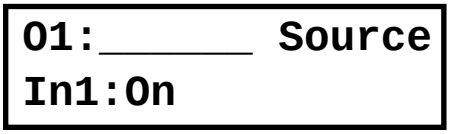
```
O1:_______ Limit
ATTACK:10ms
```

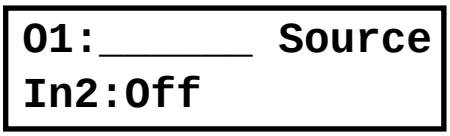
• **RELEASE** - Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.

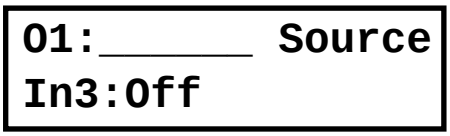
```
O1:_______ Limit
RELEASE:8xAtck
```

6.2.5.Source - Input Source

• **1,2,3** – Input channel source for the current output channel. Can be set to enable the input source (On) 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.







6.2.6.Ch-Name - Channel Name

• Refer to the Input Menus for details

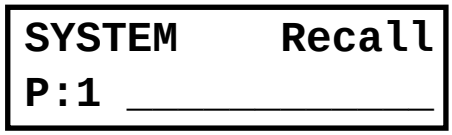
6.3.System Menu

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

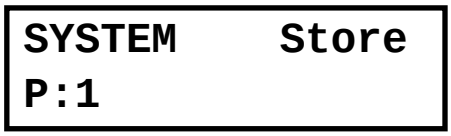
• **P:#** - Program Number to be recalled. Press *Enter* twice to confirm the operation.



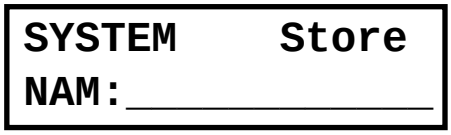
6.3.2.Store - Program store

The DSP**306** has a built in non-volatile memory that can store up to 30 different program setups. 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.

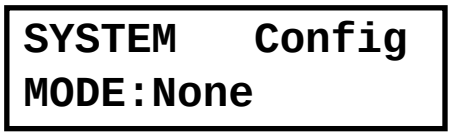
• **P:#** - Program Number for the current data to be stored.



• **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
None	Any	Any	Any	Any	Any	Any
Stereo 2-Way	In1	In1	In2	In2	Any	Any
Stereo 3-Way	In1	In1	In1	In2	In2	In2

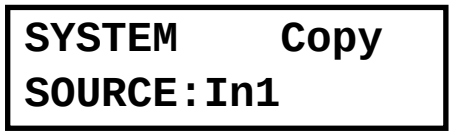
The unit assigns the Input source for the corresponding outputs when the Mode of Configuration is selected. The crossover point parameters like the filter type, cut-off frequency and slope have to be configured manually in the Xover Menu in each Output menu.

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.

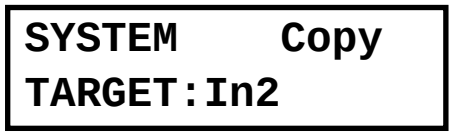
6.3.4.Copy - Copy channels

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.

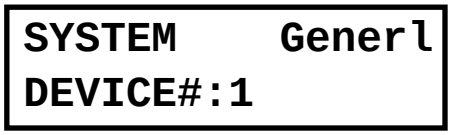


6.3.5.General - General system parameters

• **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.

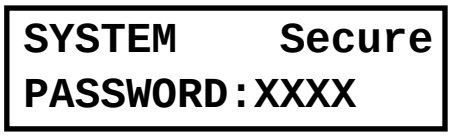
• **DEVICE#** - Assigns the device ID from 1 to 16. This ID is useful when a network of more than 1 unit is present.



6.3.6.Security - Security Lock

The DSP**306** enables the user to secure the unit and prevent undesired changes in the setup. In order to lock/unlock the unit the user must enter the correct password.

• **PASSWORD** - The password of the DSP**306** is 4 characters in length. The user can change it via the PC application software. The factory default of a new unit does not require a password.

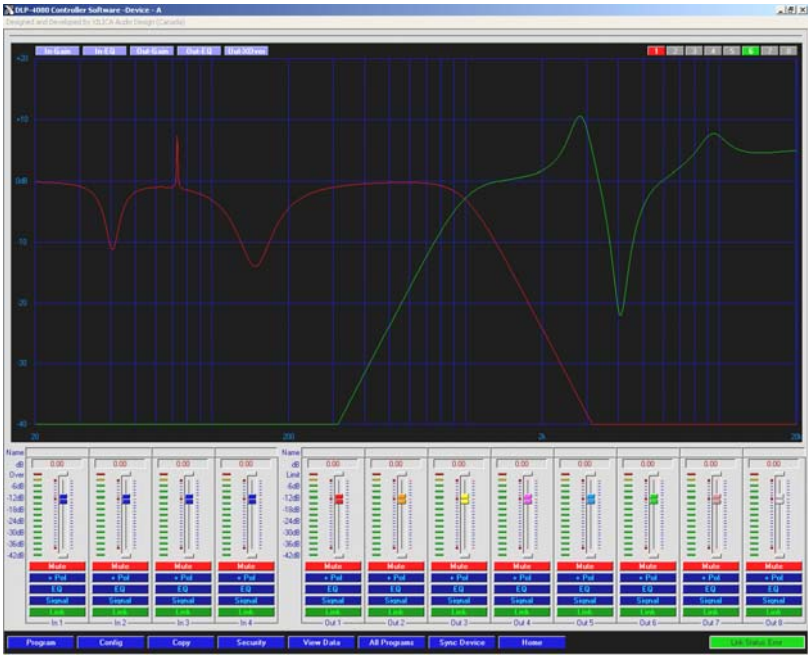


7.QUICK REFERENCE

Parameters	Menu <<Menu>>	Field <<Cursor>>	Min	Max	Steps	Units
Level	Signal	LEVEL	-40	+15	0.25	dB
Polarity	Signal	POL	+ / -			
Delay	Signal	DELAY	0	2,400	1	21us steps
EQ Number	EQ	EQ#	1	6	1	
EQ Level	EQ	LEVEL	-30	+15	0.25	dB
EQ Frequency	EQ	FREQ	20	20,000	1	Hz
EQ Bandwidth	EQ	BW	0.02	2.50	0.01	Octave
Crossover Low	XOver	FTRL	Off / Butterworth / Linkwitz-Riley / Bessel			
Crossover Low	XOver	FRQL	20	20,000	1	Hz
Crossover Low	XOver	SLPL	6	48	6	dB/octave
Crossover High	XOver	FTRH	Off / Butterworth / Linkwitz-Riley / Bessel			
Crossover High	XOver	FRQH	20	20,000	1	Hz
Crossover High	XOver	SLPH	6	48	6	dB/octave
Out Limit Threshold	Limit	THRESH	-20	+20	0.5	dBu
Out Attack Time	Limit	ATTACK	0.3	100	0.1/1	ms
Out Release Time	Limit	RELEASE	2 / 4 / 8 / 16 / 32X Attack time			
Source	Source	In1, In2, In3	Off / On			
Channel Name	Name	NAME	6 characters			

8.PC CONTROL SOFTWARE

The DSP**306** is shipped with a special PC Graphic User Interface (GUI) application - XLink. XLink gives the user an option to control the DSP**306** unit from a remote PC via the RS232 serial communication link. 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.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……...32-bit (40-bit extended)
Sampling Rate…….. 48 kHz
Analog Converters……High Performance 24-bit
Propagation Delay…… 3 ms

Front Panel Controls

Display……. 2 x 16 Character Backlit LCD
Level Meters…….5 segment LED
Buttons……..9 Mute Controls
6 Menu Controls
Dial Encoder…….Embedded Thumb Wheel

Connectors

Audio…… 3-pin XLR
Pin 1: shield
Pin 2: live (+)
Pin 3: return (-)
RS-232……..Female DB-9
Power……Standard IEC Socket

General

Power…… 115 / 230 VAC (50 / 60Hz)
Dimensions……... 483x44x203 mm
Weight…….. 4.6kg

Audio Control Parameters

Gain…….. -40 to +15dB in 0.25dB steps
Polarity……. +/-
Delay…… Up to 50ms per I/O

- Equalizers (6 per I/O) -

Type……..Parametric, Hi-shelf, Lo-shelf
Gain…….. -30 to +15dB in 0.25dB steps
Bandwidth…….0.02 to 2.50 octaves (Q=0.5 to 72)

- Crossover Filters (2 per Output) -

Filter Types…….. Butterworth, Bessel, Linkwitz-Riley
Slopes……... 6 to 48dB/oct

- Limiters -

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