



POWERSHAPTM PS-2.1

Class D Amplifier with DSP

User Manual Version 1.2
11/19/2013



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IMPORTANT SAFETY INSTRUCTIONS

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

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER - SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



CAUTION

RISK OF
ELECTRIC SHOCK!
DO NOT OPEN!



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated "dangerous voltage" within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Important Safety Instructions:

1. Read and understand this entire manual.
2. Keep this manual available for reference.
3. Heed all warnings and precautions in this manual and notices marked on the product.
4. Do not use this product near water or damp environments.
5. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
6. Do not install near any heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat or other high ambient temperature environments. Provide for proper airflow around product.
7. 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 prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
8. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the product.
9. Only use attachments/accessories specified by the manufacturer.
10. Unplug this product during lightning storms or when unused for long periods of time.
11. Refer all servicing to qualified service personnel. Servicing is required when the product has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the product, the product has been exposed to rain or moisture, does not operate normally, or has been dropped.
12. The product shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the product.
13. Power Sources - The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.
14. Object and Liquid Entry - Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through the openings.
15. Servicing - The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel. There are no user serviceable components inside the product.

Precautions:

1. POWER CORD NOTICE FOR INTERNATIONAL OPERATION - Please call *Digital Audio Labs* Support at (952) 471-7700.
2. Power – WARNING, BEFORE TURNING ON THE POWER FOR THE FIRST TIME, READ THE FOLLOWING SECTION CAREFULLY. All models are designed for use only with the power supply voltage of the region where they are sold.
3. Voltage Label (Rear Panel) – A label located on the power supply indicates the AC power input for the unit. The label will read 100-240V AC, 50/60Hz, 1.4A.
4. Do not touch the PS-2.1 with wet hands. Do not handle the PS-2.1 or power cord when your hands are wet or damp. If water or any other liquid enters the PS-2.1 cabinet, take the PS-2.1 to qualified service personnel for inspection.
5. Place the PS-2.1 in a well, ventilated location. Take special care to provide plenty of ventilation on all sides of the PS-2.1 especially when it is placed in an audio rack. If ventilation is blocked, the PS-2.1 may over heat and malfunction. Do not expose the PS-2.1 to direct sun light or heating units as the PS-2.1 internal components temperature may rise and shorten the life of the components. Avoid damp and dusty environments.
6. Care – From time to time you should wipe off the front and side panels and the cabinet with a dry soft cloth. Do not use rough material, thinners, alcohol or other chemical solvents or cloths since this may damage the finish or remove the panel lettering.
7. Class II wiring required.
8. The manufacturer cannot be held responsible for damages caused to persons, things or data due to an improper or missing ground connection.
9. Before powering this amplifier, verify that the correct voltage rating is being used.
10. Do not use this amplifier if the electrical power cord is frayed or broken.
11. Do not remove the cover. Failing to do so will expose you to potentially dangerous voltage.

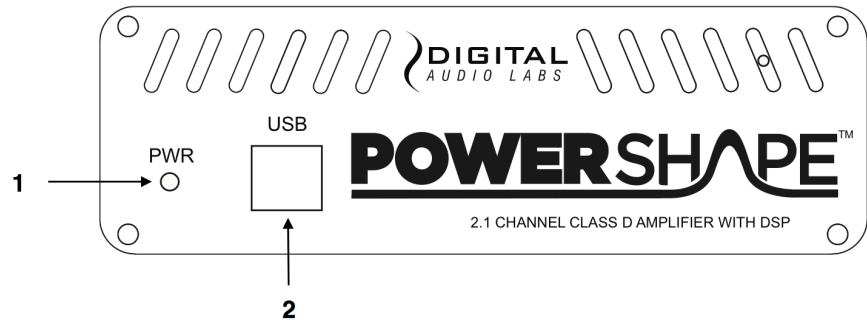
WHAT'S IN THE BOX

1. PowerShape 2.1 - Class D Amplifier with DSP
2. Power Supply (24VDC 2.5A)
3. IEC Power Cable (6' Length)
4. USB Cable (6' Length)
5. Quick Start Guide

Visit www.digitalaudio.com/powershape for the latest PowerShape 2.1 configuration software and documentation.

CONNECTIONS

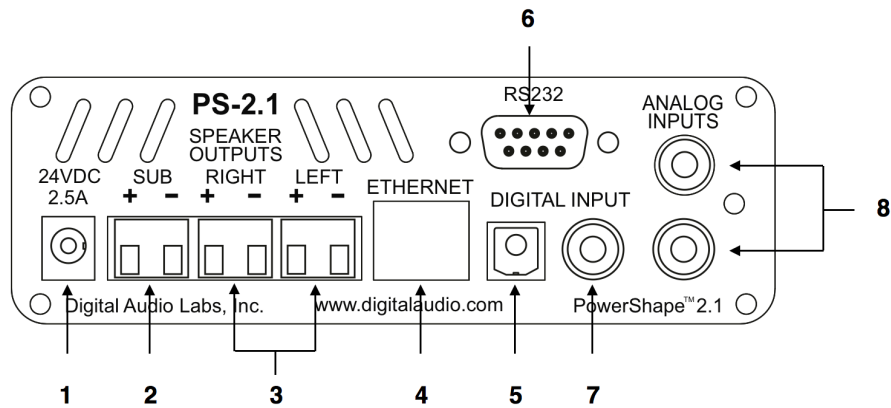
FRONT PANEL



1 - Power Indicator

2 - USB

REAR PANEL



1 - 24VDC Power Input

5 - Digital Optical Input (Stereo)

2 - Subwoofer Output

6 - RS-232

3 - Speaker Outputs (Left/Right)

7 - Digital Coax Input (Stereo)

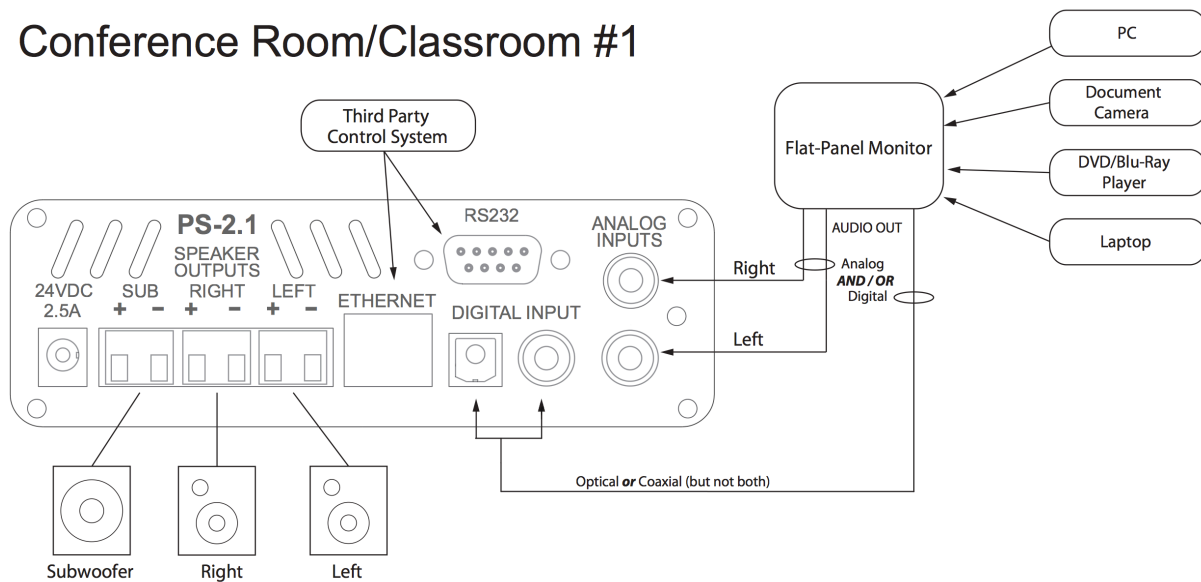
4 - Ethernet

8 - Analog Inputs (Stereo)

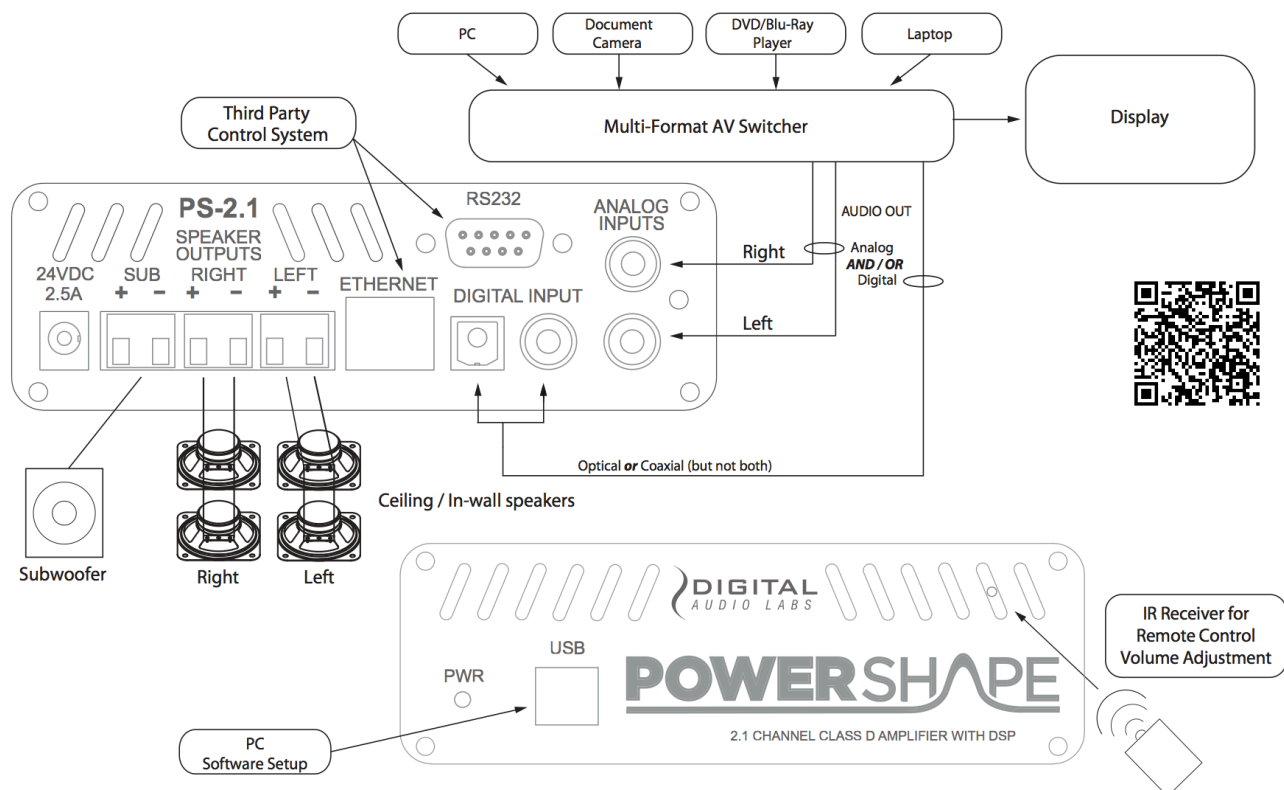
INSTALLATION

There are two factory presets for quick setup: Conference/Classroom #1 & #2.

Conference Room/Classroom #1



Conference Room/Classroom #2



GENERAL INSTRUCTIONS

- Review safety warnings on page 4 before proceeding.
- Use only the included 24VDC power supply and power cable.
- Surge protector or power conditioner recommended.
- Leave adequate space on rear and sides for proper ventilation.
- Only plug this device into a grounded outlet.

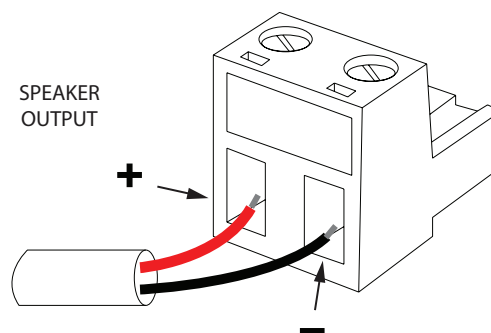
TERMINAL BLOCK WIRING

A full set of terminal block connectors is included.

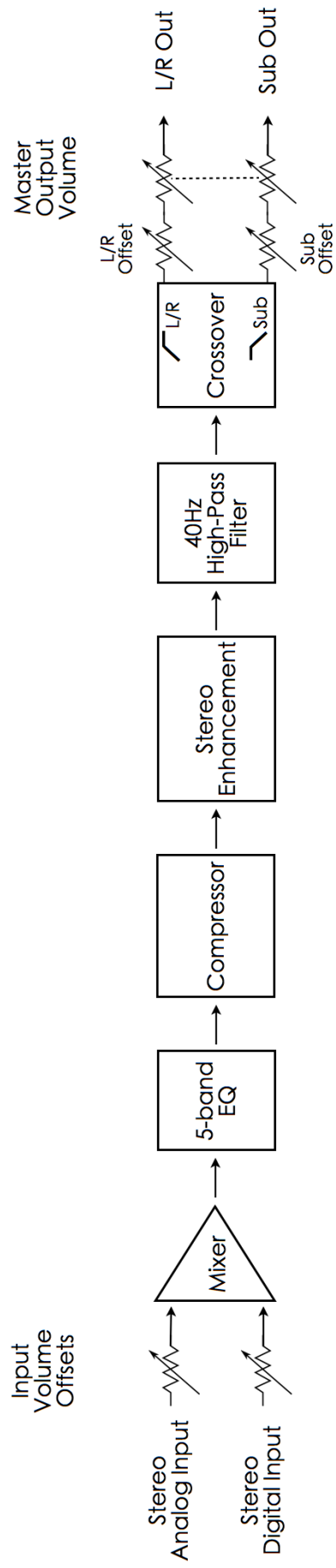
General instructions for terminal block connectors:

Strip the wire 1/4 inch (6 mm) and connect to the plugs as shown.
Be sure to tighten the screws with a flathead screw driver.

Connector Part Number: OSTTJ020150



PowerShape 2.1 Block Diagram



INPUT CONFIGURATION

The PowerShape 2.1 offers both stereo analog and stereo digital inputs.

- Analog Input -10dBV (RCA style connectors)
- Digital Input (S/PDIF Coax or Toslink Optical, only one active at a time)

All inputs in the system offer channel specific volume offsets that can be adjusted from -64.0dB to 0.0dB in 0.5dB steps (note: 0.0dB is full volume). Analog and digital inputs can also be muted independently.

OUTPUT CONFIGURATION

The PowerShape 2.1 provides Left, Right and Sub speaker level, terminal block outputs. A wide range of volume and processing controls are available to tune the system.

EQ

A stereo 5-Band parametric EQ is available on the master output. This audio processing shapes the overall frequency response of the PS-2.1.

EQ BAND	FILTER TYPE	FREQUENCY	Q
Low	Shelving +/- 12dB in 0.5dB steps	Variable 31 Frequency Band Options	0.707 Fixed
Mid 1	Peak/Dip +/- 12dB in 0.5dB steps		Variable
Mid 2	Peak/Dip +/- 12dB in 0.5dB steps		Variable
Mid 3	Peak/Dip +/- 12dB in 0.5dB steps		Variable
High	Shelving +/- 12dB in 0.5dB steps		0.707 Fixed

CROSSOVER

When using both high frequency and subwoofer speakers, a high pass filter can be inserted on the left/right speaker outputs and a low pass filter can be inserted on the subwoofer output. Additional controls include a 40Hz high pass filter and speaker offsets that can be used to balance the levels of different speakers in a system.

CROSSOVER PARAMETER	DESCRIPTION
Filter	None, Low Pass, High Pass
Type	Butterworth, Linkwitz-Riley, Bessel
Frequency	20Hz to 20kHz in 1Hz steps
40Hz High Pass	On/Off
L/R and Sub Speaker Offsets	-64dB to 0.0dB in 0.5dB steps

COMPRESSOR

A stereo compressor is available on the master output. This audio processing reduces the dynamic range of the PS-2.1.

COMPRESSION PARAMETER	RANGE
Threshold	-64.0 to 0.0 in 0.5dB steps
Ratio	1.0:1 to 10.0:1 in 0.1 steps
Attack	0ms to 500ms in 1ms steps
Release	0ms to 2500ms in 1ms steps
Makeup Gain	0 to 24dB in 0.5dB steps

STEREO ENHANCEMENT

A stereo enhancement features is available on the master output. Use this control to increase the stereo image of your system when speaker placement is close or a wider stereo field is desired. When this feature is configured to mono, a uniform input is distributed to all outputs, perfect for multi-zone installations requiring the same signal in different zones.

MASTER OUTPUT VOLUME

The master output of the system can be adjusted from $-\text{Inf}$ (-64.0dB) to +24dB in 0.5db steps. The master output volume can also be muted.

CONTROL AND SETUP OPTIONS

The PowerShape 2.1 offers several control options including USB, RS-232, Ethernet and Infrared. If this is your first time using this device it is recommended that you download the latest PowerShape 2.1 configuration software from www.digitalaudio.com/powershape and connect via USB to access the real time controls of the PS-2.1. See the Programmer's Guide (p. 20) for detailed programming commands to control all parameters of the PS-2.1.

USB

The PowerShape 2.1 configuration software provides access to all controls, settings and if necessary, firmware update. When using an external control system, this software can be used to configure and test the PS-2.1. The configuration software provides real-time control of all parameters.

RS-232

The RS-232 port provides an interface between a PC or control system and the PS-2.1. A straight wired 9pin male to female serial cable is required. See the Programmer's Guide Appendix (p. 20) for more information.

ETHERNET

The Ethernet port is used to configure, monitor, and control the PS-2.1 via standard 10Base-T and 100Base-TX Ethernet speeds. Use an Ethernet crossover cable to connect the PS-2.1 directly to a computer. Use a standard (non-crossover) Ethernet cable if the PS-2.1 and computer are connected indirectly using an Ethernet repeater hub or switch. All devices connected to the Ethernet port, including repeater hubs, switches, and the computer's Network Interface Card (NIC) must support 10Base-T or 100Base-T communication. See the Programmer's Guide Appendix (p. 20) for more information.

INFRARED (IR)

The PowerShape 2.1 has a built in IR receiver that is accessible through the front panel. Master output volume controls (UP, DOWN, MUTE) can be adjusted with an IR remote control. See the Programmer's Guide Appendix (p. 21) for more information.

PRESETS

Three factory presets can be loaded in the PowerShape 2.1 configuration software or via command over RS-232 or Ethernet. The factory presets provide examples of how to configure the output for 2.0 stereo, 3.0 monaural and 2.1 stereo with a sub.

Four user presets can be saved and loaded in the PowerShape 2.1 configuration software or via command over RS-232 or Ethernet. The user presets provide easy recall to many settings at once, and can greatly simplify programming in environments that have repeatable conditions.

POWER SAVE MODE

Power save settings can be configured with the PowerShape 2.1 configuration software or via command over RS-232 or Ethernet. The threshold control sets the audio trigger level for this feature. The delay control sets the amount of time audio needs to be absent, below the threshold, before the PS-2.1 enters power save. By default this feature is turned off.

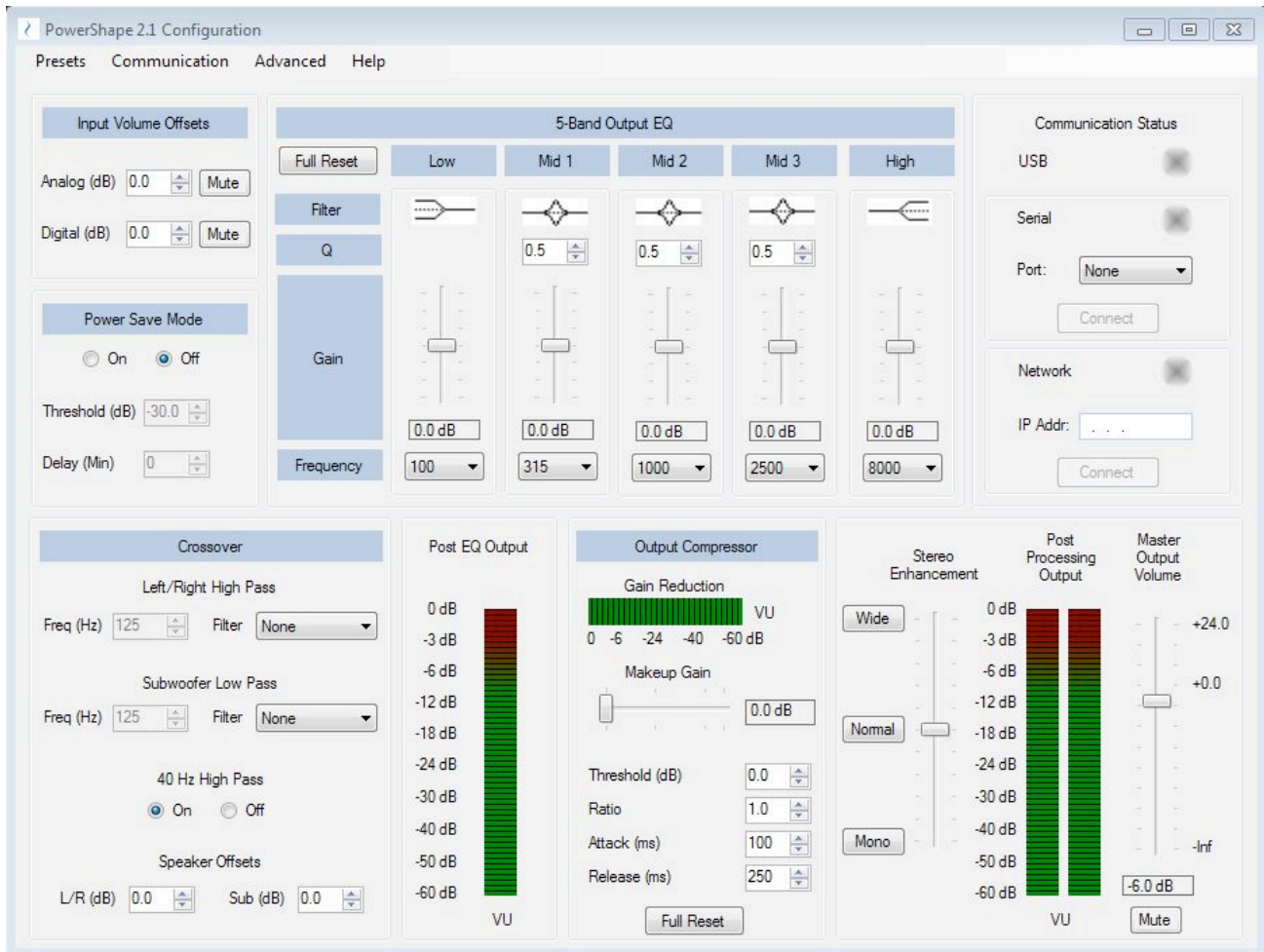
When the PS-2.1 is idle, power save mode cuts the power consumption in half.

6 Watts Idle Power (not in power save mode)

3 Watts Idle Power (power save mode)

SOFTWARE CONFIGURATION

The PowerShape 2.1 configuration software provides real time control of all audio and control parameters. Most editable parameters are presented on a single screen for quick, intuitive access. The application can be run in standalone mode without a PS-2.1, or it can control a PS-2.1 via USB, Serial (RS-232) or Network (Ethernet). The latest version of this software is available at www.digitalaudio.com/powershape.



AUDIO PROCESSING

See the Block Diagram, Input Configuration and Output Configuration sections of the manual for operational information related to the audio processing.

COMMUNICATION STATUS

When the configuration software is connected to a PS-2.1 via USB, Serial or Network the corresponding green indicator will illuminate. If using the serial connection, configure the port and select the connect button. If using the network connection, configure the IP address and select the connect button.

SERIAL (RS-232) CONFIGURATION

Additional serial port configuration settings are located within the Communication section of the menu bar. Serial settings can be configured in this box.

NETWORK (ETHERNET) CONFIGURATION

Additional network port configuration settings are located within the Communication section of the menu bar. Network settings can be configured in this box.

SAVE, LOAD AND PRESETS

The Presets section of the menu bar provides options to open and save configuration files and load and save presets.

NEW, OPEN AND SAVE

New: Performs a full reset of the settings in the application.

Open: Load an existing .xml configuration file. Perfect for installs that require multiple PS-2.1's with the same settings.

Save/Save As: Save the currently selected configuration settings to a file on your computer. Perfect for backup or duplicating your PS-2.1 configuration in another unit.

FACTORY PRESETS

Three factory presets can be loaded: 2.0 stereo, 3.0 monaural and 2.1 stereo with a sub. These are baseline presets that are intended to be edited further.

USER PRESETS

Four user presets can be saved and loaded. The user presets provide easy recall to many settings at once, and can greatly simplify programming in environments that have repeatable conditions.

FIRMWARE UPDATE

The Advanced section of the menu bar provides a firmware update option. The latest PowerShape 2.1 firmware version is available at www.digitalaudio.com/powershape.

HELP

The Help section of the menu bar provides the ability to see current version of the PowerShape configuration software. This version is located in the lower left corner of the box in a X.X.X.X format. If a PowerShape 2.1 is connected to the computer the Main CPU section will display the firmware version of the unit.

USER MAINTENANCE

ENVIRONMENTAL CONSIDERATIONS

The biggest factor in the lifetime of any electronic device is excess heat. The PowerShape 2.1 is designed to handle any of the heat produced internally, but external sources of heat should be taken into account when installing the PS-2.1.

If the PS-2.1 is installed in an enclosed equipment rack or closet ensure that the ambient temp of the space with the equipment running remains below 90 degrees Fahrenheit.

Dust build up inside the unit can cause excess heat buildup. It is a good idea to keep the operating environment as clean and dust free as possible.

CLEANING

Before cleaning any part of the PS-2.1, disconnect the power supply. Use a soft cloth and mild non-abrasive solution to clean the faceplates and chassis.

WARNING - Never let any liquid reach the internal parts of the amplifier.

WARRANTY AND SERVICE

DIGITAL AUDIO LABS LIMITED WARRANTY

Digital Audio Labs warrants their products against defects in material and workmanship for a period of two years from date of purchase. During this period, Digital Audio Labs will, at its option, repair the defective unit or replace it with a new or rebuilt one.

The warranty does NOT cover:

- Damage due to abuse, misuse, or accident.
- Damage due to operation contrary to the instructions in the product instruction manual.
- Units on which the product serial number has been removed or altered.
- Units that have been serviced by unauthorized personnel.

All implied warranties, including warranties on merchantability and fitness, are limited in time to the length of this warranty. Some states do not allow time limitations on implied warranties, so this limitation may not apply to you. Digital Audio Labs' liability is limited to the repair or replacement of its product. Digital Audio Labs shall in no way be held liable for incidental or consequential damages resulting from the use of their product or its software, including, without limitation, damages from loss of business profits, business interruption, loss of business information or other pecuniary loss. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

REPAIR POLICY

Please do not return the product without obtaining an RMA number first. Contact Digital Audio Labs at support@digitalaudio.com to acquire an RMA number. Do not return the product to the place of purchase. Please write the RMA number on the outside of the shipping carton. Any product sent to us without a valid RMA number will be refused. Include the following with the product: a brief description of the problem, your name, return shipping address, phone number and the RMA number. Do not include any accessories. DAL is not responsible for any damage to or loss of the product during transit. We recommend that customers obtain a receipt and tracking number for all packages shipped to us. Turnaround time on repairs is generally ten business days. If you live outside of the United States, please contact your local distributor for warranty service.

Please return product to:

Digital Audio Labs
Attn: RMA Number
1266 Park Road
Chanhassen, MN 55317
USA

WARRANTY SERVICE

You will be required to pay the shipping charges when you ship your product to DAL. DAL will pay for return shipping via UPS ground. We reserve the right to inspect any product that may be the subject of any warranty claim before repair is carried out. For warranty service, we may require proof of the original date of purchase if you have not registered your product with DAL. Final determination of warranty coverage lies solely with Digital Audio Labs. Please refer to the warranty information included in this help file.

NON-WARRANTY SERVICE

If it is determined that the product does not meet the terms of our warranty, you will be billed for labor, materials, return freight and insurance. There is a \$50 USD minimum charge for materials and labor. Appropriate shipping charges will be applied. We require payment in advance of repair by credit card; we accept Visa and Master Card. In the event the charges are over the minimum charge, DAL will contact you and inform you of the cost of the repair before any work is completed.

TECHNICAL SPECIFICATIONS

POWERSHAPE™ PS-2.1

Parameter	Specification	Notes
Speaker Outputs		
Frequency Response	20Hz to 20kHz	+0, -3dB
Dynamic Range	>90 dB	A-weighted, typical
HF Output Power (2)	20 Watts	4-8 Ω Stereo
Sub Output Power (1)	25 Watts	4-8 Ω Stereo
HF THD+N	0.16%*	20 watts into 8 Ω , 20-20kHz
Sub THD+N	0.02%*	25 watts into 8 Ω , 20-20kHz
Analog Input (Stereo)	-10dBV	10 k Ω Input Impedance
Digital Inputs (Stereo)		Stereo S/PDIF Coax or Optical
Infrared (IR)	38kHz	Front Panel IR Receiver
Compressors	User Adjustable	Digital Signal Processing (DSP)
Equalizers		
Crossovers		
System Control	Ethernet, RS-232, USB	
External Power Supply	24VDC, 60W	
Box Dimensions	5.45" W x 1.75" H x 6.8" D	
Weight	1.25 lb. (0.57 kg)	

*THD+N measurements taken with a 180Hz 2nd order crossover.

APPENDIX

PROGRAMMER'S GUIDE

The PowerShape 2.1 amplifier can be remotely operated by control and automation systems, such as those manufactured by Crestron and AMX. One RS-232 serial port and one Ethernet network port (Telnet protocol, single client) are provided.

RS-232 Serial Port

The RS-232 serial port is a DE-9F connector, configured as DCE. Serial port data rates of 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 baud, data formats of 8 data bits with no parity and 7 data bits with even or odd parity, and one or two stop bits are supported. The baud rate, data format and number of stop bits is configurable from the PC GUI or with program commands.

DE-9F Pin	Signal
1	not used
2	TxD output
3	RxD input
4	not used
5	GND
6	not used
7	not used
8	not used
9	not used

Ethernet Network Port

The Ethernet network port is a RJ45 jack, wired as an MDI device. Both 10Base-T and 100Base-TX speeds are supported. The left LED indicates the link speed (off = no link, yellow = 10 Mbps, green = 100 Mbps), and the right LED indicates activity (off = no activity, yellow = halfduplex, green = fullduplex).

RJ45 Pin	Signal
1	TX +
2	TX –
3	RX +
4	not used
5	not used
6	RX –
7	not used
8	not used

The network port supports IPv4. The network port's IP address can be assigned dynamically by a DHCP or BOOTP server, assigned dynamically using 169.254.xxx.yyy link-local addressing (AutoIP / RFC 3927) when there is no DHCP or BOOTP server available (not recommended), or configured statically. Selection of dynamic vs. static IP assignment and configuration of static IP, subnet mask and gateway IP addresses can be done with either the PC GUI or with program commands.

The network port supports connection of a single client and uses the Telnet protocol. The TCP port number is configurable either from the PC GUI or with program commands.

Infrared (IR) Control

The PowerShape 2.1 also allows the amplifier output volume and output mute controls to be changed using an infrared (IR) remote. The PowerShape 2.1 uses the NEC infrared protocol with an IR wavelength of 950 nm and a carrier frequency of 38 kHz. To allow off-the-shelf remotes to be used, the PowerShape 2.1 responds to several IR remote 32-bit command codes. These command codes correspond to several TVs that use the NEC protocol.

Volume Up (increases output volume by 0.5 dB):

00 FF 70 8F
18 E7 40 BF
1C E3 70 8F
20 DF 40 BF
28 D7 98 67

Volume Down (decreases output volume by 0.5 dB):

00 FF F0 0F
18 E7 C0 3F
1C E3 F0 0F
20 DF C0 3F
28 D7 18 E7

Mute/Unmute (switches output mute on and off):

00 FF 08 F7
18 E7 90 6F
1C E3 18 E7
20 DF 50 AF
20 DF 90 6F
28 D7 58 A7

Output volume and output mute changes that occur using an IR remote are reported on the RS-232 Serial Port and Ethernet Network ports as output volume and output mute changes.

Program Command / Response Protocol

Both the serial and network ports use the same command/response protocol. All commands and responses are composed of 7-bit ASCII characters. Both commands and responses start with an equals sign ('=') and end with an exclamation point ('!'). There are two commands, “get” and “set”.

The get command allows the client to inspect the configuration of the amplifier. The format of a get command is:

=g**ITEM**!

Example: =g**ov**!
GET ITEM

where **ITEM** is the name of the parameter being inspected. The amplifier will send a response that is in the same format as the set command.

The set command allows the client to change the configuration of the amplifier. The format of a set command is:

=s**ITEM:VALUE**!

Example: =s**ov:-20**!
SET ITEM VALUE

where **ITEM** is the name of the parameter being changed and **VALUE** is the new value for the specified parameter.

ITEM specifies the name of one of the amplifier's parameters. A list of the available parameters follows below, under section heading “Parameter Item Names”.

VALUE specifies the new value for the specified item. The allowable choices for **VALUE** are indicated in the description of each **ITEM**.

For example, one of the items that can be changed the output volume level. This item is called “ov”. The value for the “ov” command is specified in ½ dB steps, so to set the output volume -6 dB, the command would be:

=sov:-12!

To get the current output volume, the command would be:

=gov!

and the amplifier would respond with:

=sov:-12!

Characters received by the amplifier that do not occur between the “=” and the “!” are ignored. This allows for clients that send line termination characters, such as CR and LF, at the end of each line.

Parameter Item Names

Version and status information. All items in this section are valid only for a get command.

get boot firmware version number: **verboot**

The value returned is the juxtaposition of the major and minor version numbers. The lower 3 digits are the minor version number (typically 2 digits, but expanded to 3 digits when 100 or above), and the remaining upper digits are the major version number.

Example responses:

```
=sverboot:2015!    version is 2.15
=sverboot:1004!    version is 1.04
=sverboot:23106!   version is 23.106
```

get main CPU firmware version number: **vercpu**

The value returned is in the same format as the “verboot” item, above.

get DSP1 firmware version number: **verdsp1**

The value returned is in the same format as the “verboot” item, above.

get DSP2 firmware version number: **verdsp2**

The value returned is in the same format as the “verboot” item, above.

get all configuration settings: **all**

This causes the amplifier to report the current values for all controls, as if a “get” command was issued for each of them. This command can be useful to initialize an application with the current parameters being used by the amplifier. This command does not return status information or VU settings.

Input channel controls.

get or set digital input volume: **iv0**

get or set analog input volume: **iv1**

The value indicates the input volume level, in ½ dB steps. The input volume is an integer between -128 and 0 (-64.0 dBFS to 0 dBFS). A volume of -64.0 dBFS mutes the input, and a volume of 0 dBFS is full volume (unity gain). The input volume is a digital volume adjustment that occurs in the DSP.

Example:

```
=siv1:-41!           set analog input volume to -20.5 dB
```

change digital input volume by specified value (valid for set only): **iv0step**

change analog input volume by specified value (valid for set only): **iv1step**

The value indicates the relative input volume adjustment, in ½ dB steps. The volume adjustment is an integer between -12 and 12 (-6.0 dB to +6.0 dB). This command allows relative adjustment of the channel's current input volume. When this command is used, the amplifier will respond with the new volume level, as if a “get” command had been issued.

Examples:

```
=siv0step:4!         increase digital input volume by 2.0 dB
=siv1step:-10!       decrease analog input volume by 5.0 dB
```

get or set digital input mute control: **imute0**

get or set analog input mute control: **imute1**

The value indicates whether the input channel mute control is off (not muted) or on (muted), and is an unsigned integer between 0 and 1. Changing the input mute control does not change the channel's input volume setting.

0 = channel not muted

1 = channel muted

Examples:

```
=simute0:1!          mute digital input
=simute1:0!          unmute analog input
```

get or set digital input enable mask : **dienab**

The value indicates which of the two digital inputs are enabled, and is an unsigned integer between 1 and 3. Inputs that are not enabled will be ignored by the amplifier.

1 = only S/PDIF (coax) input enabled

2 = only TOSLINK (optical) input enabled

3 = both S/PDIF and TOSLINK inputs enabled

Example:

```
=sdienab:2!          enable only TOSLINK (optical) input
```


Output channel controls.

get or set output volume: **ov**

The value indicates the output volume level, in ½ dB steps. The output volume is an integer between -128 and 48 (-64.0 dB to +24 dB). A volume of -64.0 dB mutes the output. The output volume adjustment occurs in the digital amplifier.

PLEASE NOTE: output volume levels above +12.5 dB should be used with caution.

Example:

=sov:-41! set output volume to -20.5 dB

change output volume by specified value (valid for set only): **ovstep**

The value indicates the relative output volume adjustment, in ½ dB steps. The volume adjustment is an integer between -12 and 12 (-6.0 dB to +6.0 dB). This command allows relative adjustment of the current output volume. When this command is used, the amplifier will respond with the new volume level, as if a “get” command had been issued.

Examples:

=sovstep:-8! decrease output volume by 4.0 dB
=sovstep:5! increase output volume by 2.5 dB

get or set output mute control: **omute**

The value indicates whether the output mute control is off (not muted) or on (muted), and is an unsigned integer between 0 and 1. Changing the output mute control does not change the output volume setting.

0 = output not muted

1 = output muted

Example:

=solute:1! mute output

get or set output EQ frequency for bass EQ band (low shelving): **eqf0**
 get or set output EQ frequency for mid 1 EQ band (peak/dip EQ): **eqf1**
 get or set output EQ frequency for mid 2 EQ band (peak/dip EQ): **eqf2**
 get or set output EQ frequency for mid 3 EQ band (peak/dip EQ): **eqf3**
 get or set output EQ frequency for treble EQ band (high shelving): **eqf4**

The value indicates the frequency, in Hz, for the specified EQ band. For the bass and treble bands, the frequency is the edge frequency for the shelving EQ. For the mid bands, the frequency is the center frequency for the peak/dip EQ. The frequency is an unsigned integer between 20 and 20000. For compatibility with the PC GUI, it is highly recommended that the frequency set with these commands be restricted to the following values:

20, 25, 32, 40, 50, 63, 80, 100, 125, 160,
 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600,
 2000, 2500, 3150, 4000, 5000, 6300, 8000, 10000, 12500, 16000,
 20000

Use of other frequency values is allowed, but the PC GUI will not be able to select values other than what are specified above.

Examples:

=s@eqf0:100! set bass EQ frequency to 100 Hz
 =s@eqf2:4000! set mid 2 EQ frequency to 4000 Hz

get or set output EQ boost/cut for bass EQ band: **eq0**
 get or set output EQ boost/cut for mid1 EQ band: **eq1**
 get or set output EQ boost/cut for mid2 EQ band: **eq2**
 get or set output EQ boost/cut for mid3 EQ band: **eq3**
 get or set output EQ boost/cut for treble EQ band: **eq4**

The value indicates the boost/cut level for the specified EQ band, in 1/2 dB steps. The boost/cut is an integer between -24 and 24 (-12.0 to +12.0 dB). A boost/cut of 0 dB indicates flat response (no boost or cut).

Examples:

=seq1:5! set mid 1 EQ boost/cut to +2.5 dB
 =seq4:-20! set treble EQ boost/cut to -10.0 dB

get or set output EQ Q for mid 1 EQ band: **eqq1**
 get or set output EQ Q for mid 2 EQ band: **eqq2**
 get or set output EQ Q for mid 3 EQ band: **eqq3**

The value indicates the “Q” of the EQ filter for the specified EQ band, in 1/10 steps. The Q is an unsigned integer between 1 and 100 (i.e., 0.1 to 10.0, in steps of 0.1). The Q for the bass and treble EQ bands is fixed at 0.707 and cannot be changed. A Q of 1.5 is recommended for the mid EQ bands.

Examples:

=seqq1:8! set mid 1 EQ Q to 0.8
 =seqq2:15! set mid 2 EQ Q to 1.5

get or set output compressor's threshold: **cpthr**

The value indicates the threshold setting for the output compressor, in $\frac{1}{2}$ dB steps. The threshold is an integer between -128 and 0 (-64.0 dBFS to 0.0 dBFS). A threshold of 0.0 dBFS results in no compression.

Example:

`=scpthr:-12!` set compressor threshold to -6.0 dBFS

get or set output compressor's compression ratio: **cprat**

The value indicates the compression ratio for the output compressor, in $\frac{1}{10}$ ths. The ratio is an unsigned integer between 10 (1.0:1) and 100 (10.0:1). A ratio of 1.0:1 turns off compression.

Example:

`=scprat:40!` set compression ratio to 4.0:1

get or set output compressor's attack time: **cpatt**

The value indicates the attack time for the output compressor, in 2 msec steps (i.e., the attack time divided by 2). The attack time is an unsigned integer between 1 (2 msec) and 250 (500 msec).

Example:

`=scpatt:75!` set attack time to 150 msec

get or set output compressor's release time: **cprel**

The value indicates the release time for the output compressor, in 10 msec steps (i.e., the release time divided by 10). The release time is an unsigned integer between 1 (10 msec) and 250 (2500 msec).

Example:

`=scprel:30!` set release time to 300 msec

get or set output compressor's make-up volume: **cpmak**

The value indicates the make-up volume (additional gain) to be applied after compression, in $\frac{1}{2}$ dB steps. The make-up gain is an unsigned integer between 0 and 48 (0.0 dB to +24.0 dB). A make-up gain of 0 dB results in no additional gain after compression.

Example:

`=scpmak:18!` set make-up volume to +9.0 dB

get or set stereo effect setting: **steff**

The value indicates the stereo effect setting, and can be used to narrow or widen the stereo field of the output. The stereo effect setting is an integer between -100 and +100.

+100	widened stereo output
0	normal stereo output (default setting)
-100	monaural output

Example:

`=ssteff:0!` set the output to monaural

get or set left/right output crossover filter type: **xomtype**

get or set subwoofer output crossover filter type: **xostype**

The value indicates the specified output's crossover filter type and is an unsigned integer value between 0 and 3.

0 = none (crossover disabled)

1 = Butterworth

2 = Linkwitz-Riley

3 = Bessel

Examples:

=sxomtype:1!

set L/R output crossover to use a Butterworth filter

=sxostype:2!

set sub output crossover to use a Linkwitz-Riley filter

get or set left/right output crossover frequency: **xomf**

get or set subwoofer output crossover frequency: **xosf**

The value indicates the edge frequency, in Hz, for the specified output's crossover and is an unsigned integer value between 20 and 20000.

Examples:

=sxomf:180!

set L/R output crossover frequency to 180 Hz

=sxosf:200!

set sub output crossover frequency to 200 Hz

get or set output crossover high-pass filter enable: **xohpf**

The value indicates whether the output crossover high-pass filter is enabled, and is an unsigned integer value between 0 and 1.

0 = 40 Hz high-pass filter off

1 = 40 Hz high-pass filter on

Example:

=sxohpf:1!

turn on output crossover high-pass filter

get or set left/right output speaker offset: **spmo**

get or set subwoofer output speaker offset: **spso**

The value indicates the audio level offset of the specified speaker output, in 1/2 dB steps, and is an integer between -128 and 48 (-64.0 dB to +24.0 dB). A volume of -64.0 dB mutes the output. Adjustment of these values allows the relative output level of the left/right and subwoofer speakers to be balanced.

Example:

=sspmo:-20!

set left/right speaker offset to -10.0 dB

=sspso:7!

set subwoofer speaker offset to +3.5 dB

System / configuration controls.

load preset (valid for set only): **lprs**

The value is the factory or user preset number from which a saved configuration will be loaded into the amplifier. The preset number is an unsigned integer value, and is between 1 and 4 for user presets or between 11 and 13 for factory presets.

- 1 = load configuration from user preset #1
- 2 = load configuration from user preset #2
- 3 = load configuration from user preset #3
- 4 = load configuration from user preset #4
- 11 = load configuration from factory preset #1 (2.0 stereo)
- 12 = load configuration from factory preset #2 (3.0 monaural)
- 13 = load configuration from factory preset #3 (2.1 stereo)

Examples:

```
=slprs:2!           load configuration from user preset #2
=slprs:11!          load configuration from factory preset #1 (2.0 stereo)
```

save preset (valid for set only): **sprs**

The value is the user preset number into which the current configuration will be stored. The user preset number is an unsigned integer between 1 and 4.

- 1 = save current configuration as user preset #1
- 2 = save current configuration as user preset #2
- 3 = save current configuration as user preset #3
- 4 = save current configuration as user preset #4

Example:

```
=ssprs:1!           save current configuration as user preset #1
```

reboot amplifier (valid for set only): **reboot**

This command reboots the amplifier. The value is always 1. This command can be used to reboot the amplifier after changing the serial port or network configuration, causing the new serial or network settings to be used.

Example:

```
=sreboot:1!         reboot amplifier
```

get or set sleep delay time: **sleepdly**

The value is the delay time, in minutes, after which the amplifier will go into “sleep” mode if the audio level remains below the sleep threshold. The value is an unsigned integer between 0 and 120. A delay time of 0 disables sleep mode.

Examples:

```
=ssleepdly:10!      set sleep delay to 10 minutes
=ssleepdly:0!       disable sleep mode
```

get or set sleep threshold: **sleepthr**

The value is the audio level below which the amplifier will be considered “idle”. When idle, the amplifier will be put into “sleep” mode after the specified delay time. The value is a signed integer between -80 and -30 (-80.0 dBFS to -30.0 dBFS).

Examples:

=sleepthr:-60!	set sleep threshold to -60 dBFS
=sleepthr:-48!	set sleep threshold to -48 dBFS

get or set serial port baud rate: **serbaud**

The value indicates the baud rate at which the RS-232 serial port will operate. The value is an unsigned integer, and must be one of the following standard baud rate values. Changes to the serial port baud rate take effect the next time the amplifier is powered on or rebooted.

1200	19200
2400	38400
4800	57600
9600	115200

Examples:

=serbaud:9600!	set serial port baud rate to 9600 baud
=serbaud:115200!	set serial port baud rate to 115200 baud

get or set serial port data format: **serfmt**

The value indicates the data format that will be used on the RS-232 serial port. The value is a 3-character 7-bit ASCII string, and must be one of the following values. Changes to the serial port data format take effect the next time the amplifier is powered on or rebooted.

8N1 = 8 data bits, no parity, 1 stop bit
8N2 = 8 data bits, no parity, 2 stop bits
7E1 = 7 data bits, even parity, 1 stop bit
7E2 = 7 data bits, even parity, 2 stop bits
7O1 = 7 data bits, odd parity, 1 stop bit
7O2 = 7 data bits, odd parity, 2 stop bits

Examples:

=serfmt:7E1!	set serial port data format to 7 data bits, even parity, 1 stop bit
=serfmt:8N1!	set serial port data format to 8 data bits, no parity, 1 stop bit

get or set network port IP address: **netip**

The value is the IP address to be used by the network port. A valid IP address (e.g., 10.1.2.3) selects static IP address assignment. A value of 0.0.0.0 selects dynamic IP address assignment using DHCP, BOOTP or AutoIP. Changes to the network port IP address take effect the next time the amplifier is powered on or rebooted.

Examples:

=snetip:10.1.35.108!	set static IP address to 10.1.35.108
=snetip:0.0.0.0!	select dynamic IP assignment

get or set network port subnet mask: **netsubm**

The value is the subnet mask to be used when static IP address assignment is selected. The value is a valid IP subnet mask (e.g., 255.255.255.0). If dynamic IP address assignment is used, the subnet mask should be set to 0.0.0.0. Changes to the network port static subnet mask take effect the next time the amplifier is powered on or rebooted.

Example:

=snetsubm:255.255.0.0! set static subnet mask to 255.255.0.0

get or set network port gateway IP address: **netgw**

The value is the gateway IP address to be used when static IP address assignment is selected. The value is a valid IP address (e.g., 10.1.2.1). If dynamic IP address assignment is used, the gateway address should be set to 0.0.0.0. Changes to the network port static gateway IP address take effect the next time the amplifier is powered on or rebooted.

Example:

=snetgw:10.1.1.1! set static gateway IP address to 10.1.1.1

get or set network port Telnet port number: **netport**

The value is the TCP port number used by the network port's Telnet server. The value must be one of the following values. Typically, port 23 is used, but the other port numbers can be used if necessary. Changes to the network port Telnet port number take effect the next time the amplifier is powered on or rebooted.

23	10001	50001
	10002	50002
	10003	50003
	10004	50004
	10005	50005
	10006	50006
	10007	50007
	10008	50008

Example:

=snetport:10001! configure Telnet server to listen on port 10001

get assigned IP address (valid for get only): **netasgip**

The value returned is the IP address assigned to the network port. This can be used to get the IP address assigned in dynamic (DHCP/BOOTP/AutoIP) mode.

Example response:

=snetasgip:192.168.1.107! assigned IP address is 192.168.1.107

get assigned subnet mask (valid for get only): **netasgsubm**

The value returned is the subnet mask assigned to the network port.

Example response:

=snetasgip:255.255.255.0! assigned subnet mask is 255.255.255.0

get assigned gateway address (valid for get only): **netasggw**

The value returned is the gateway address assigned to the network port.

Example response:

=snetasggw:192.168.1.1! assigned gateway address is 192.168.1.1

get network port MAC address (valid for get only): **netmacaddr**

The value returned is the MAC address assigned to the network port.

Example response:

=snetmacaddr:11:22:33:44:55:66! MAC address is 11:22:33:44:55:66

VU meter controls.

When enabled, VU reports are sent automatically at approximately the requested rate in the same format as responses to a “get” command. VUs appear in a “vu” response. The value is a 4-character string. Each character is one of: 0123456789ABCDEFG. The first character is the compressor RMS input level. The second character is the compressor gain reduction level (0 dB = no compression). The third and fourth characters indicate the left and right channel peak output level.

VU meter characters:

G = 0 dBFS
F = -2 dBFS to -1 dBFS
E = -4 dBFS to -3 dBFS
D = -6 dBFS to -5 dBFS
C = -8 dBFS to -7 dBFS
B = -10 dBFS to -9 dBFS
A = -12 dBFS to -11 dBFS
9 = -15 dBFS to -13 dBFS
8 = -17 dBFS to -16 dBFS
7 = -20 dBFS to -18 dBFS
6 = -24 dBFS to -21 dBFS
5 = -28 dBFS to -25 dBFS
4 = -34 dBFS to -29 dBFS
3 = -42 dBFS to -35 dBFS
2 = -54 dBFS to -43 dBFS
1 = -65 dBFS to -55 dBFS
0 = less than -65 dBFS

get or set VU meter rate: **vrur**

The value indicates the number of input VU reports per second, and is an unsigned integer between 0 and 30. A value of 0 turns off input VU reports. Once the input VU report rate has been set, VU reports are sent automatically at approximately the specified rate.

Examples:

=svurat:10!	select 10 VU reports per second
=svurat:0!	turn off VU reports

Quick Reference Guide

Version and status information. All items in this section are valid only for a get command.

get boot firmware version number: **verboot**
get main CPU firmware version number: **vercpu**
get DSP1 firmware version number: **verdsp1**
get DSP2 firmware version number: **verdsp2**
get all configuration settings: **all**

Input channel controls.

get or set digital input volume: **iv0**
get or set analog input volume: **iv1**
change digital input volume by specified value (valid for set only): **iv0step**
change analog input volume by specified value (valid for set only): **iv1step**
get or set digital input mute control: **imute0**
get or set analog input mute control: **imute1**
get or set digital input enable mask : **dienab**

Output channel controls.

get or set output volume: **ov**
change output volume by specified value (valid for set only): **ovstep**
get or set output mute control: **omute**
get or set output EQ frequency for bass EQ band (low shelving): **eqf0**
get or set output EQ frequency for mid 1 EQ band (peak/dip EQ): **eqf1**
get or set output EQ frequency for mid 2 EQ band (peak/dip EQ): **eqf2**
get or set output EQ frequency for mid 3 EQ band (peak/dip EQ): **eqf3**
get or set output EQ frequency for treble EQ band (high shelving): **eqf4**
get or set output EQ boost/cut for bass EQ band: **eq0**
get or set output EQ boost/cut for mid1 EQ band: **eq1**
get or set output EQ boost/cut for mid2 EQ band: **eq2**
get or set output EQ boost/cut for mid3 EQ band: **eq3**
get or set output EQ boost/cut for treble EQ band: **eq4**
get or set output EQ Q for mid 1 EQ band: **eqq1**
get or set output EQ Q for mid 2 EQ band: **eqq2**
get or set output EQ Q for mid 3 EQ band: **eqq3**
get or set output compressor's threshold: **cpthr**
get or set output compressor's compression ratio: **cprat**
get or set output compressor's attack time: **cpatt**
get or set output compressor's release time: **cprel**
get or set output compressor's make-up volume: **cpmak**
get or set stereo effect setting: **steff**
get or set left/right output crossover filter type: **xomtype**
get or set subwoofer output crossover filter type: **xostype**
get or set left/right output crossover frequency: **xomf**
get or set subwoofer output crossover frequency: **xosf**
get or set output crossover high-pass filter enable: **xohpf**
get or set left/right output speaker offset: **spmoff**
get or set subwoofer output speaker offset: **spsoff**

System / configuration controls.

load preset (valid for set only): **lprs**
save preset (valid for set only): **spres**
reboot amplifier (valid for set only): **reboot**
get or set sleep delay time: **sleepdly**

get or set sleep threshold: **sleepthr**
get or set serial port baud rate: **serbaud**
get or set serial port data format: **serfmt**
get or set network port IP address: **netip**
get or set network port subnet mask: **netsubm**
get or set network port gateway IP address: **netgw**
get or set network port Telnet port number: **netport**
get assigned IP address (valid for get only): **netasgip**
get assigned subnet mask (valid for get only): **netasgsubm**
get assigned gateway address (valid for get only): **netasggw**
get network port MAC address (valid for get only): **netmacaddr**

VU meter controls.

get or set VU meter rate: **vurat**

Alphabetic Command Reference

all: get all configuration settings
cpatt: get or set output compressor's attack time
cpmak: get or set output compressor's make-up volume
cprat: get or set output compressor's compression ratio
cprel: get or set output compressor's release time
cpthr: get or set output compressor's threshold
dienab: get or set digital input enable mask
eq0: get or set output EQ boost/cut for bass EQ band
eq1: get or set output EQ boost/cut for mid1 EQ band
eq2: get or set output EQ boost/cut for mid2 EQ band
eq3: get or set output EQ boost/cut for mid3 EQ band
eq4: get or set output EQ boost/cut for treble EQ band
eqf0: get or set output EQ frequency for bass EQ band (low shelving)
eqf1: get or set output EQ frequency for mid 1 EQ band (peak/dip EQ)
eqf2: get or set output EQ frequency for mid 2 EQ band (peak/dip EQ)
eqf3: get or set output EQ frequency for mid 3 EQ band (peak/dip EQ)
eqf4: get or set output EQ frequency for treble EQ band (high shelving)
eqq1: get or set output EQ Q for mid 1 EQ band
eqq2: get or set output EQ Q for mid 2 EQ band
eqq3: get or set output EQ Q for mid 3 EQ band
imute0: get or set digital input mute control
imute1: get or set analog input mute control
iv0: get or set digital input volume
iv0step: change digital input volume by specified value (valid for set only)
iv1: get or set analog input volume
iv1step: change analog input volume by specified value (valid for set only)
lprs: load preset (valid for set only)
netasggw: get assigned gateway address (valid for get only)
netasgip: get assigned IP address (valid for get only)
netasgsubm: get assigned subnet mask (valid for get only)
netgw: get or set network port gateway IP address
netip: get or set network port IP address
netmacaddr: get network port MAC address (valid for get only)
netport: get or set network port Telnet port number
netsubm: get or set network port subnet mask
omute: get or set output mute control
ov: get or set output volume
ovstep: change output volume by specified value (valid for set only)
reboot: reboot amplifier (valid for set only)
serbaud: get or set serial port baud rate
serfmt: get or set serial port data format
sleepdly: get or set sleep delay time
sleepthr: get or set sleep threshold
spmoff: get or set left/right output speaker offset
sprs: save preset (valid for set only)
spsoff: get or set subwoofer output speaker offset
steff: get or set stereo effect setting
verboot: get boot firmware version number
vercpu: get main CPU firmware version number
verdsp1: get DSP1 firmware version number
verdsp2: get DSP2 firmware version number
vurat: get or set VU meter rate
xohpf: get or set output crossover high-pass filter enable
xomf: get or set left/right output crossover frequency
xomtype: get or set left/right output crossover filter type
xosf: get or set subwoofer output crossover frequency
xostype: get or set subwoofer output crossover filter type

TROUBLESHOOTING

PROBLEM	VERIFY THAT...
No Power	AC mains cord is properly inserted into a 100-240VAC receptacle and the external power supply
	DC jack (2.1mm barrel) is properly inserted into the PS-2.1 power connector
No Sound	Analog and/or digital input cabling is terminated correctly and the audio source is functioning properly
	Speaker output cable is terminated properly and the load is 4 ohms or greater
	PS-2.1 is programmed properly with the correct audio and control settings
Audio Distortion	Audio mixer settings are configured properly. Use the configuration software to check VU's, volume settings, compression settings and EQ boosts
Audio Dropouts	Verify that the speaker load is 4 ohms or greater
	The master volume is not set too high in certain configurations. There is plenty of gain built into the PS-2.1 designed to help amplify lower level input signals; in turn, this gain also provides the potential to drive the amp into overload protection mode.
General	The amplifier shows up in the configuration software and is running the latest firmware version

