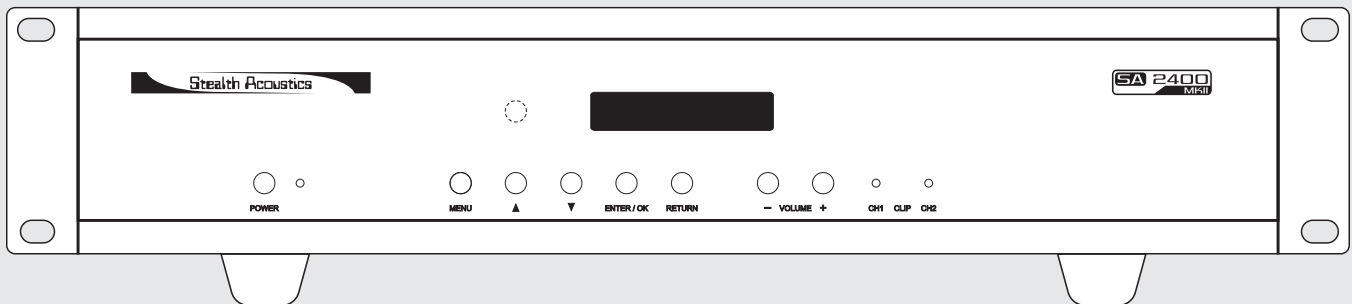


SA PRO-POWER AMPLIFIERS



SA2400 MKII User Guide

▶ 2-Channel Amplifier with DSP



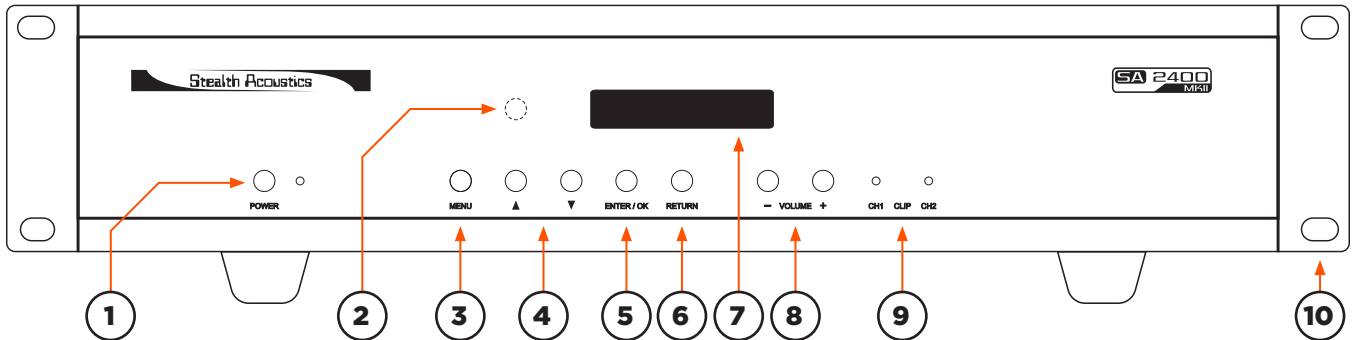
STEALTH ACOUSTICS

Download the **Stealth Signal Management System** software for powerful DSP programming tools.

StealthAcoustics.com/sa2400-mkii

IMPORTANT SAFETY PRECAUTIONS:

- ▶ Read these instructions and keep this guide for future reference.
- ▶ Do not block ventilation openings.
- ▶ Do not install near any heat sources such as radiating heat registers, or other apparatuses that produce heat.
- ▶ Do not expose this equipment to rain or moisture.
- ▶ Do not defeat the safety purposes of the polarization or grounding type plug.
- ▶ Ensure proper AC mains power cord is connected.
- ▶ Clean only with a soft dry cloth.
- ▶ Refer all repairs to a qualified service professional.

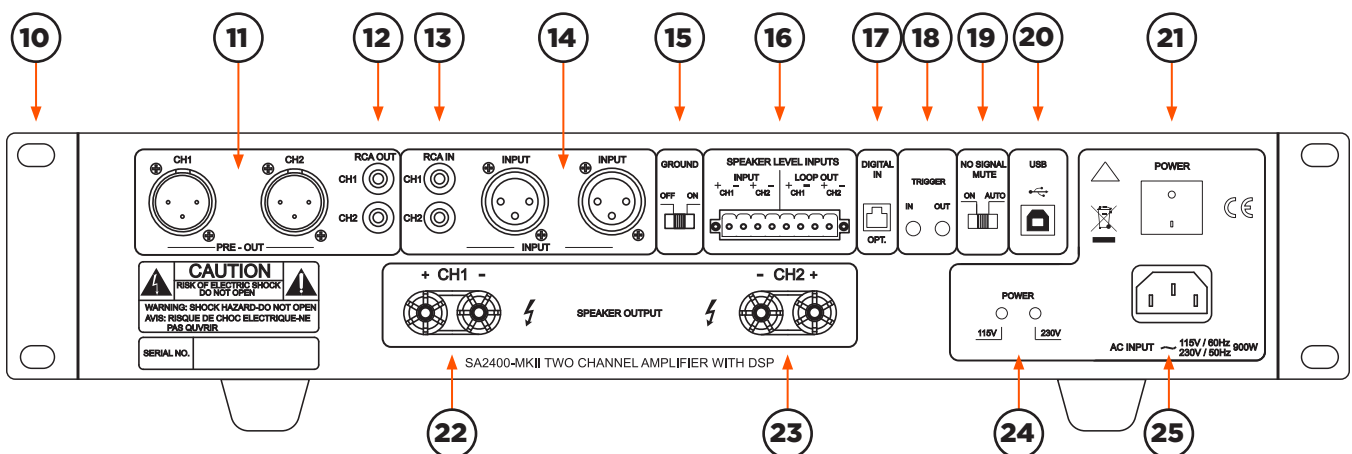


Front Panel

1. **Power Button** with indicator light
(red when powered off)
2. IR Sensor
3. **Main Menu** Button
4. **Menu ▲▼** Navigation Buttons
5. **Enter/Ok** Button
6. **Return** to Previous Menu Button
7. Display Screen
8. **Volume -/+** Buttons
9. Clipping Lights
10. Removable Rack Ears

Rear Panel

11. XLR Balanced Line Output
12. RCA Unbalanced Line Level Output
13. RCA Unbalanced Line Level Input
14. XLR Balanced Line Input
15. Ground Lift Switch (for hum reduction use)
16. Speaker Level Input/Output Terminal Block
17. Optical Input
18. 12V Trigger (In/Out)
19. No Signal Auto-Mute Switch (default = ON)
20. USB (Type B) for Computer Connection
21. Main Power Switch
22. Channel 1 Speaker Binding Posts
23. Channel 2 Speaker Binding Posts
24. Voltage Indicator
25. 115V-230V 50Hz / 60Hz AC Inlet
(Auto Voltage Select)



QUICK START

- ▶ Connect audio source to amplifier using appropriate input jacks.
- ▶ Connect speakers to speaker output binding posts noting proper polarity.
- ▶ Connect appropriate AC power cord to AC inlet and to AC mains source (115v-230v 50Hz / 60Hz).
- ▶ Turn on sound source to normal level.
- ▶ Turn on SA2400 amplifier. (Volume will fade in to factory default level of 40 dB or last setting.)
- ▶ Adjust volume using front panel controls.
- ▶ Program DSP features using the front panel controls. (See *Front Panel Programming* section in this document.)
- ▶ **Download Stealth Signal Management System (SSMS) software for free** from StealthAcoustics.com for additional interfacing capabilities. *A Windows™ based computer must be connected via USB to use this feature.*

OVERVIEW

The SA2400 amplifier is a reliable high-current power source for Stealth speakers and subwoofers, as well as for powering any traditional loudspeaker. The SA2400 features fully-independent channel programming for maximum flexibility and incorporates powerful internal

Digital Signal Processing (DSP) which may be configured using the front panel buttons, or by using the **Stealth Signal Management System (SSMS)** software on a USB connected Windows™ based computer.

SA2400MKII FEATURES

- ▶ 12V Trigger Function
- ▶ 450W per Channel (@ 4Ω)
- ▶ Programmable Channel Assignment of Inputs (including mono-summing)
- ▶ Variable High Pass and Low Pass Filters with Filter Slope Selections (per channel)
- ▶ Eleven Bands of Fully-Parametric EQ (per channel)
- ▶ Full Limiter Stage with Variable Threshold, Attack, Release, Ratio and Knee (per channel)
- ▶ Delay (100 milliseconds maximum) (per channel)
- ▶ Internal Pink Noise Generator
- ▶ Ten Savable and IR Recallable Internal Amplifier Presets
- ▶ Stealth Factory Optimization Presets for Quick and Repeatable Tuning of Stealth Speakers and Subwoofers
- ▶ Full File Management via Optional Free **SSMS software** for Storing Unlimited Configurations
- ▶ IR Control of Volume and Preset Selection
- ▶ Input Pass Through Selectable Either “Pre” or “Post “ DSP

INTERNAL PRESETS

Presets store and recall a complete DSP state of the amplifier (other than routing, utility and master volume settings) and are a quick way to setup a Stealth speaker system, or change usage modes (EG: day mode / night mode, etc.). Presets may be recalled via IR command;

from the front panel menu; or via Stealth's **SSMS software**. (See *Software Programming* section in this document.)

The SA2400MKII has 10 internal amplifier DSP presets:

- ▶ Presets are used to recall and store speaker optimizations, EQ, individual channel levels, or other amplifier DSP settings.
- ▶ The internal amplifier Presets are pre-loaded with factory optimization parameters for Stealth speakers and subwoofers.
- ▶ Presets may be reconfigured and saved via the front panel buttons, or for more versatility, by using **SSMS software** and a USB connected computer.
- ▶ Additional custom or factory preset configurations and unlimited amplifier DSP configurations may be stored and recalled using Stealth **SSMS software** and a USB connected computer.

Preset 1	LR6G optimization (<i>stereo</i>)
Preset 2	LR8G optimization (<i>stereo</i>)
Preset 3	LR3G optimization (<i>stereo</i>)
Preset 4	LRX-85-ACT optimization (<i>bi-amp</i>) Channel 1 ▶ Low Frequency Channel 2 ▶ High Frequency
Preset 5	LRX-83 optimization (<i>stereo</i>)
Preset 6	StingRay 6 optimization (<i>stereo</i>)
Preset 7	StingRay 8 optimization (<i>stereo</i>)
Preset 8	B22G B30G StingRay 430 Image Sub (<i>subwoofer</i>) Channel 1 & 2 ▶ configured for subwoofer use
Preset 9	LRX-85 optimization (<i>stereo</i>)
Preset 10	Full Range + Subwoofer optimization (<i>bi-amp</i>) Channel 1 ▶ Low Frequency - SR430 Channel 2 ▶ High Frequency - StingRay 6

FRONT PANEL PROGRAMMING

While using SSMS software programming is preferred for quickly adjusting the DSP functions, you may also perform all DSP programming from the front panel buttons as well as adjust other parameters like input routing, pre/post DSP pass through settings, input defaults and front panel display brightness. Please refer to the front panel diagram for the location of the following Menu and Menu Navigation buttons:

- ▶ **Main Menu** Button - Accesses the front panel menu structure; select individual channel, or both channels together for programming.
- ▶ **Menu ▲▼** Navigation Buttons - Steps through the available menu items.
- ▶ **Enter/Ok** Button - Selects the displayed menu item.
- ▶ **Return** to Previous Menu Button - Reverts to the previous Menu item. Multiple presses exits the menu, returning the display back to normal operation.

Below are non-DSP programming features of the SA2400. These and certain other functions are accomplished only from the front panel buttons. See the *Programming Menu - Front Panel Navigation* diagram in this document for complete menu programming options.

Setup Menu - Input Assign

Input routing and other non-DSP “Utility” functions are accomplished via the front panel menu buttons under the Setup/Input Assign menu (see *Programming Menu - Front Panel Navigation* diagram). You may assign any physical input channel to either or both amplifier channels. This allows for functions such as “mono-summing” of the stereo inputs into two mono signals, or to map inputs to different outputs. **Default assignment is: Chnl1=Chnl1; Chnl2=Chnl2.**

Pass Through Output Assign

Selects whether the line level pass-through outputs are tapped before or after the DSP stage. When in “Pre-DSP” (default) mode, the pass through outputs are unaffected by DSP programming. In “Post-DSP”, any DSP programming of input signals is sent to the line-level output jacks. **Default setting is “Pre-DSP”.**

DSP Presets

10 internal DSP presets may be recalled and saved using the front panel buttons, or via IR commands. Factory settings for optimizing Stealth speakers are pre-installed in the presets, which may be altered, renamed and re-saved depending on need. See *Internal Presets* section for more details on DSP presets.

Display Brightness

The front panel LCD display brightness is adjustable as “Bright” or four levels of “Dim” to suit the installation needs.

Utility Functions

A built in Pink Noise Generator is available under the Utility menu, as well as firmware version information and factory default settings.

Auto Input Sensing

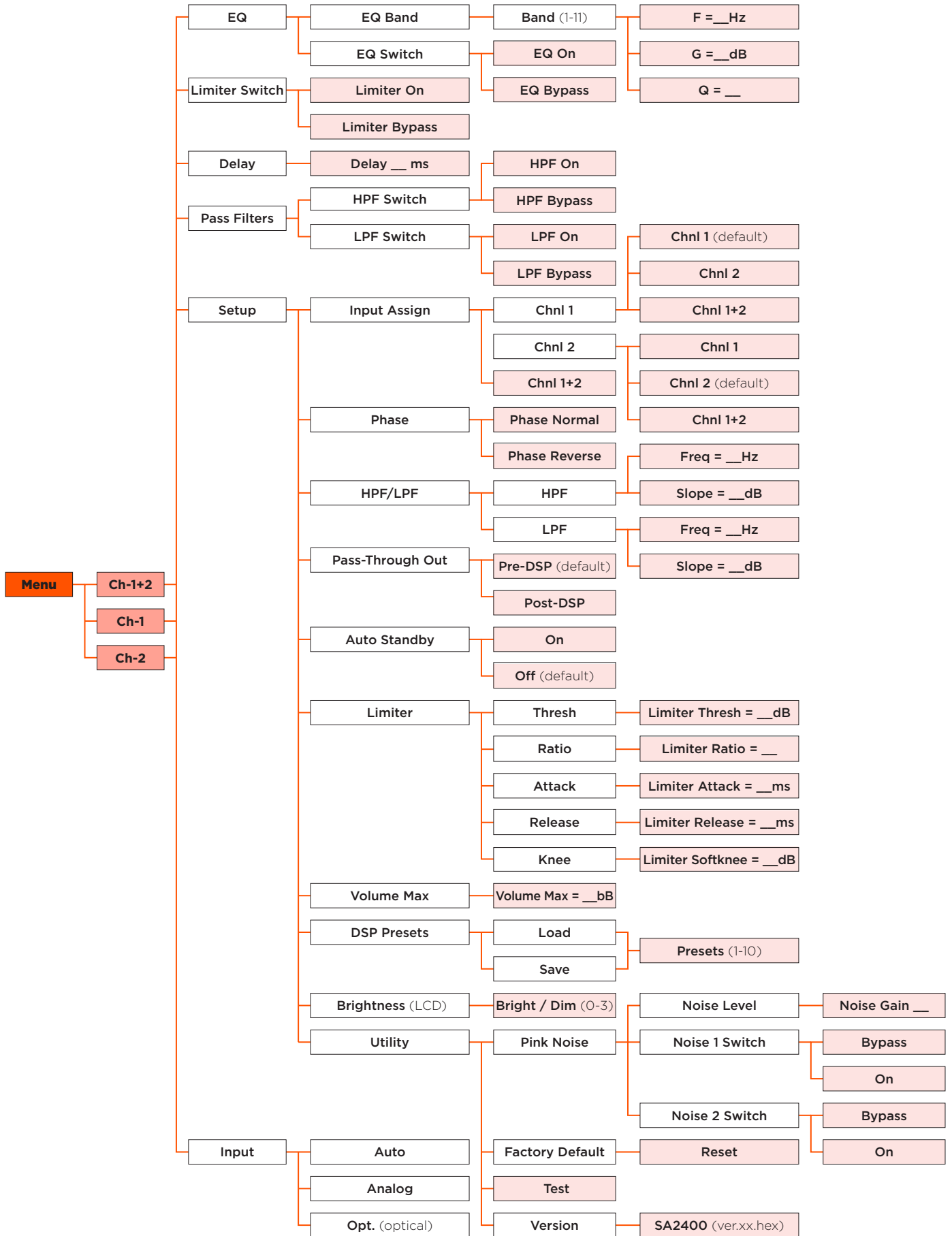
The amplifier may be set to automatically detect an Optical or Analog input, or to amplify only the Analog, or Digital Optical inputs. **Default = Auto** (amplifier auto detects optical signal presence).

IR CONTROL

Master Volume and Internal Preset recall may be remotely controlled via IR commands, using the front panel IR target and an IR compatible remote control or control system.

- ▶ IR HEX command strings are available at StealthAcoustics.com/sa2400-mkii

PROGRAMMING MENU - FRONT PANEL NAVIGATION



STEALTH SIGNAL MANAGEMENT SYSTEM (SSMS) SOFTWARE

Programming of the amplifiers DSP section is best accomplished via a graphical user interface, using Stealth's free Stealth Signal Management System software (SSMS) and a USB connected Windows™ computer. The software allows the programmer to easily see and manipulate DSP programming for either channel independently, or both channels together, all from one screen.

▶ The SA2400MKII requires SSMS Version 1.0.7 or later

The screenshot shows the Stealth Signal Management System (SSMS) software interface for the SA2400MKII amplifier. The interface is divided into several sections:

- File Management:** Includes buttons for 'Load' and 'Save'.
- DSP Presets:** Includes buttons for 'Load' and 'Save', with a dropdown menu showing 'LRX83'.
- Channel Select:** Features three radio buttons for 'CH1', 'CH2', and 'CH1+CH2'.
- Limiter Status:** Includes a 'Limiter Status' toggle (On/Bypass) and five sliders for 'Threshold', 'Attack', 'Release', 'Ratio', and 'Knee'.
- Equalizer:** Includes an 'Equalizer' toggle (On/Bypass) and a table of 11 parametric equalizers (PEQ1-PEQ11). Below the table is a detailed view for PEQ1 with sliders for frequency (f), gain, and Q.
- High/Low Pass:** Includes 'High pass' and 'Low pass' toggles (On/Bypass) and sliders for frequency (f) and slope.
- Channel/Volume Controls:** Includes controls for 'CH1' and 'CH2' for 'Delay', 'Phase', 'Vol1 dB', and 'Vol2 dB', as well as a 'Master Volume dB' control.

Numbered callouts (1-14) point to various UI elements:

- 1: File Management section
- 2: DSP Presets section
- 3: Channel Select section
- 4: Limiter Status section
- 5: Equalizer section
- 6: High Pass filter section
- 7: Low Pass filter section
- 8: CH1 Delay control
- 9: CH1 Phase control
- 10: CH2 Delay control
- 11: CH2 Phase control
- 12: CH1 Vol1 dB control
- 13: CH2 Vol2 dB control
- 14: Master Volume dB control



Download the **Stealth Signal Management System** software for powerful DSP programming tools.

StealthAcoustics.com/sa2400-mkii

1. **System Settings** menu: Access Pink Noise Generator and other factory settings
2. **File Management** Menu and Buttons: Recall and Save complete DSP setting files
3. **DSP Presets** Buttons: Load or Save a DSP state via one of the 10 internal amplifier Presets
4. **Preset Name** Window: Presets can be named when saving in software
5. **Resultant Graph Display**: Indicates current settings of EQ and Pass Filters when EQ and Filters are turned on.
6. **Channel Select** Buttons: Program either CH1, CH2 independently, or CH1+CH2 together
7. **Limiter Stage**: Use for speaker protection from overload, or to set maximum allowed output from amplifier using threshold control
8. **Channel Delay**: Delays a channels signal output from 0-100 Milliseconds
9. **EQ Settings** Window: Indicates parameter settings for all 11 Parametric EQ's, as set by the EQ Section controls
10. **Channel Phase**: Toggles signal polarity on either channel
11. **EQ Section**: Use arrows and sliders to select and set Frequency, Gain and Filter-width (Q) parameters on each of the 11 per-channel EQ bands
12. **Channel Volume / Balance**: Controls individual channel volume levels
13. **Master Volume**: Adjusts master output volume of both channels. Mirrors front panel Volume Control Buttons
14. **High and Low Pass Filters**: Use to set frequency and select slope of Pass Filters (for bi-amplification, LF/HF roll-off, or subwoofer use)

SLEEP SETTING (when 12V trigger is not used)

By default, the amplifier is designed to go into a low-power sleep setting after a period of no signal input. When signal input is restored the amplifier will wake for use. For this sleep setting to function the **No Signal Mute** switch on the back panel must be in the **ON** position (factory default) AND the **Auto Standby** setting in the menu system must be set to **OFF** (factory default).

If the amplifier is not entering or exiting the sleep state properly verify the two settings above are configured to their factory default states as noted.

12V TRIGGER - NO SIGNAL MUTE

Convenient 12V 1/8" mini TS input and output trigger jacks on the amplifiers rear panel connect to other 12V compatible components (tip = +12V / sleeve = ground). When +12V is present at the tip of the input jack, the amplifier will become active. When the amplifier is active +12V is present on the tip of the output jack, which may be used to activate other 12V trigger-compatible components.

Alternately, the amplifier may be set to a "No Signal Auto-Mute" function via the rear panel switch, which turns the main amplifier off after a few minutes if no signal is present at the inputs. When in the "Auto" position, the amplifier will immediately come to life in response to any input signal. When the switch is set to "On", the amplifier remains active, even if no signal is present.

12V TRIGGER INITIATION

In some installations utilizing the amplifiers 12V trigger input, a one-time initiation procedure may be required.

Before performing this procedure, ensure that you have a properly configured switched 12V source connected to the amplifier. Some devices provide voltages other than 12V and other devices require the trigger voltage output to be turned on or configured. Please consult the documentation for your trigger source device.

Use the included MONO 1/8" mini TS cable for 12v trigger connections. A STEREO 1/8" mini TRS cable will not work.

It is always a good practice to use a volt meter to verify proper voltage and switching at the plug connected to the amplifiers 12V jack.

If the amplifier does not immediately respond to a 12V trigger voltage connected to the amplifier, please take the following actions:

1. Turn the amplifier on by pressing the front panel power button. Wait until the front panel display shows SA-2400 MKII after the volume ramps up.
2. Apply a standard 12V trigger voltage to the "Trigger In" jack on the rear panel of the amplifier.
3. Remove the 12V trigger voltage by turning off the source of the 12 volt feed.
4. Re-activate the 12V volt trigger. This will turn the amplifier on.
5. From this point the amplifier will respond to the 12V trigger state.

Note: When the amplifier is turned off with 12V triggering, the red light on the front of the unit will light up when the amplifier is off.

▶ SPECIFICATIONS*

Power Output (per channel – both channels driven)

- ▶ 310 watts @ 8Ω < 0.05 THD
- ▶ 450 watts @ 4Ω < 0.05 THD

Frequency Response

- ▶ 20Hz-50kHz (+1/-3dB)

Total Harmonic Distortion

- ▶ < 0.05 @ 460 watt @ 4Ω / 1 kHz

Signal to Noise Ratio

- ▶ >105 dB / A weighting 20Hz-20kHz

Analog Input Sensitivity

- ▶ -1dBV for output of 312.5W / 8Ω

Maximum Voltage Gain

- ▶ 36 dB / 8Ω

Crosstalk

- ▶ >85dB

System Impedance

- ▶ 8Ω Nominal – 4Ω Minimum

Current Draw

- ▶ 13.6A @ 450W/ 4Ω – 115-230 VAC/50-60Hz

Maximum Full Output Current Draw

- ▶ 1080 watts @115V / 8Ω
(100Hz sine wave – both channels driven)
- ▶ 1560 watts @115V / 4Ω
(100Hz sine wave – both channels driven)

Average Output Current Draw

- ▶ 1/8 Audio Power = 135W (1.17A) average @ 115V / 8Ω
(normal audio program)
- ▶ 1/4 Audio Power = 270W (2.34A) average @ 115V / 8Ω
(heavy bass program / subwoofers)
- ▶ 1/8 Audio Power = 195W (1.69A) average @ 115V / 4Ω
(normal audio program)
- ▶ 1/4 Audio Power = 390W (3.39A) average @ 115V / 4Ω
(heavy bass program / subwoofers)

Heat Dissipation

- ▶ 849 BTU/Hr

Amplifier / Load Protection

- ▶ Full short circuit, open circuit, thermal, ultrasonic and RF protection
- ▶ On/Off muting with auto volume ramp up on power-up
- ▶ DC fault power supply shutdown

Fixed high-pass filter @18Hz

Stable into reactive or mismatched loads

Dimensions

- ▶ Width: 19" (483 mm) (rack ears installed)
- ▶ Width: 17" (432 mm) (rack ears removed)
- ▶ Height: 3.5" (89 mm)
- ▶ Depth: 15.75" (400 mm)

Rack Mountable

- ▶ (2) RU spaces: 3-1/2" (89mm)
- ▶ Removable rack ears

Shipping Weight

- ▶ 38 lbs. (17.2 kg)

***All specifications subject to change.**

For technical support
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