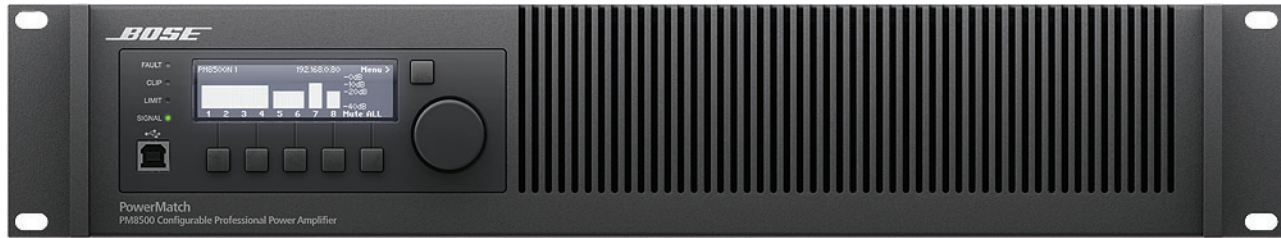


PowerMatch™ PM8500 / 8500N configurable power amplifier

BOSE

TECHNICAL DATA SHEET



Product Overview

Bose PowerMatch® PM8500 is a configurable professional power amplifier delivering concert sound quality for fixed installation sound reinforcement systems. Building on the ruggedness proven by 20 years experience building Class-D power amplifiers for the automotive market, the PM8500 adds numerous new Bose patented technologies to simultaneously provide class-leading power, efficiency, sound quality, and reliability.

Available in two versions, the PM8500 provides USB connection for single-unit setup and control using Bose ControlSpace V3.0 or higher software. The PM8500N adds Ethernet connectivity for network control and monitoring of multiple "N" version amplifiers.

Applications

Designed for a wide range of applications, including:

- Theaters
- Houses of worship
- Auditoriums
- Performing arts venues
- Arenas
- Hospitality venues

Key Features

- **PowerMatch® Class-D amplifier** – New, proprietary design combines Class-D efficiency with a dual-feedback circuit that continuously monitors and controls both the current and voltage of the output devices. This combination provides the PowerMatch amplifier with the highest-quality output power, audio performance, reliability and efficiency.
- **QuadBridge™ output mode** – Outputs can be configured as single, dual, or quad channel modes, which allows 4 kW of power to be allocated between 2 to 8 channels. These software-selectable configurations range from 8 channels at 500 watts, 4 channels at 1000 watts, 2 channels at 2000 watts or mixed combinations. Dual or quad modes can drive either low-impedance or 70 V or 100 V loads.
- **PeakBank™ power supply** – Regenerative 4-quadrant power supply with fast-tracking PFC supports high efficiency, while improving the peak burst power for superior transient response and current reserve for bass impact.
- **8 x 500 W from single household AC mains** – The PM8500 delivers 4 kW rated power from a single AC mains outlet, with greater than 75% conversion efficiency.
- **Optimized loudspeaker processing** – Integrated audio DSP for loudspeaker EQ, crossover, delay and limiting. When used with RoomMatch® and other Bose loudspeakers, the presets provide all required signal processing with optimized protection limiting of self-powered loudspeakers.
- **Software setup and network monitoring** – All models have USB for Bose ControlSpace® Designer programming, with PM8500N adding Ethernet network control and monitoring.
- **Digital expansion card slot** – Accommodates optional PowerMatch digital expansion cards such as the PowerMatch ESPLink and PowerMatch CobraNet® cards. Digital expansion cards help expand the input capability from analog to digital sources.

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Technical Specifications

Power Rating					
	2 Ω	4 Ω	8 Ω	70 V	100 V
THD for Power Rating	< 0.1 % THD	< 0.1 % THD	< 0.1 % THD	1 % THD	1 % THD
Mono Mode	500 W	500 W	300 W	Not available	Not available
Bridge Mode	500 W *	1000 W	1000 W	800 W	1000 W
I-Share Mode	1000 W	500 W *	300 W *	Not available	Not available
Quad Bridge Mode	1000 W *	2000 W	1000 W *	1600 W	2000 W
Maximum Rated Power	4000 W (total all channels)				
Peak Output Voltage	71 / 142 / 142 V (Mono / Bridge / Quad Bridge modes)				
Voltage Gain	15 to 45 dB, depending on input sensitivity and output configuration				
Audio Performance Specifications					
Frequency Response	20 Hz - 20 kHz (at 1 W and +/- 0.5 dB)				
Signal-to-Noise Ratio	> 102 dBA (1 dB below rated power)				
THD	< 0.4 % (at 1 W, 20 Hz to 20 kHz)				
Intermod Distortion - SMPTE	< 0.4 % (60 Hz, 7 kHz)				
Channel Separation (Crosstalk)	> 65 dB (adjacent channels, at 1 kHz)				
Damping Factor	> 1000 (10-1000 Hz, 4 ohms, at amplifier output)				
Integrated DSP					
A/D and D/A Converters	24-bit / 48 kHz				
Total Latency (Analog In - Amp Out)	< 0.95 ms				
Input to Output Signal Routing	8 x 8 matrix				
Loudspeaker Presets	Bose Professional				
Input EQ	5-band PEQ (+/- 20 dB), notch, shelving, high pass, low pass				
Bandpass Filters (Crossover)	Butterworth, Bessel, or Linkwitz-Riley, up to 48 dB/octave				
Loudspeaker EQ	9-band PEQ (+/- 20 dB), shelving, high pass, low pass				
Array EQ Filters	2-band RoomMatch™ array EQ				
Maximum Output Delay	3 s				
Output Limiter	Peak and RMS voltage				
Audio Inputs					
	Analog		Digital (Optional Card)		
Input Channels	8 (balanced line level)		8 (ESPLink or Cobranet)		
Input Impedance	> 100 kΩ		N/A		
Sensitivity	0, +4, +12, +24 dBu, selectable		N/A		
Maximum Input Level	+24 dBu (at 24 dBu sensitivity setting)		N/A		
Connectors, Input	3-pin Phoenix® (green color; part # 1776168)		TOSLINK (ESPLink) or Ethernet RJ45 (Cobranet)		
Audio Outputs					
Output Channels	2 to 8 configurable, using 8-pin Phoenix® connectors (part # 1718436)				
Indicators and Controls					
LED Status Indicators	Signal, limit, clip, fault				
User Interface Controls	Mute, input sensitivity, output attenuation, EQ on/off, preset select. 240 x 64 LCD. Additional controls available w/ ControlSpace® software				
Electrical Specifications					
Mains Voltage	100-240 V (50/60 Hz)				
Minimum AC Line Voltage	80 V (reduced output power)				
Maximum Inrush Current	15.4 A (230 VAC 50 Hz)				
Maximum RMS Current Draw	15 A				
Typical Current Draw, 1/3 Power	15 A @ 120 VAC / 7.5 A @ 230 VAC				
Efficiency, 1/3 Rated Power	> 75 % (pink noise input signal)				
Output Stage Topology	Class-D Switch-Mode				
Overload Protection	High temperature, DC, HF, short, voltage limiter, current limiter, inrush current, mains circuit breaker protection				
Physical					
Dimensions	3.5" H x 19" W x 20.7" D (88 mm x 483 mm x 525 mm) - 2 rack space				
Net Weight	28 lb (12.7 kg)		Shipping Weight: 35 lb (15.9 kg)		
Operating Temperature	0 °C - 40 °C				
Cooling System	Microprocessor-controlled, variable-speed fans, front to rear airflow				
General					
Setup and Configuration Software	ControlSpace V3.0 or greater				
PC Interface Connection	USB (PM8500N adds Ethernet RJ45)				
Fault Notification Output (GPIO)	NC/NO Relay Contact (1 A, 30 VDC), 3-pin Phoenix® connector (orange color; part # 1976010)				

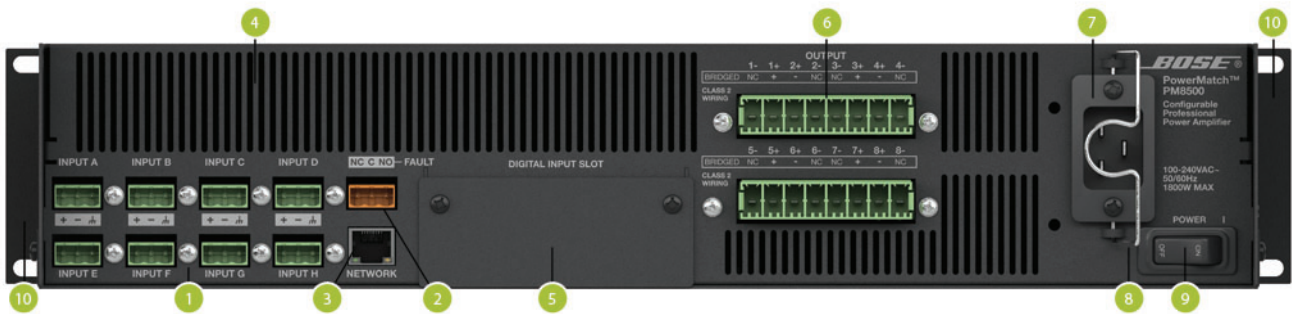
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1. LED Indicators
2. LCD Display
3. Navigation Soft Key
4. Rotary Encoder
5. Menu Soft Keys (1-5)
6. USB connector
7. Front airflow vents
8. Front rack-mount ears



1. Analog Input connectors (A-H)
2. Fault-Notification Output
3. Ethernet RJ-45 network connector (PM8500N only)
4. Rear airflow vents
5. Digital input card slot cover
6. Output connectors (1-4 and 5-8)
7. AC Mains receptacle
8. AC Mains retention clip
9. Power Switch
10. Rear rack-mount support tabs

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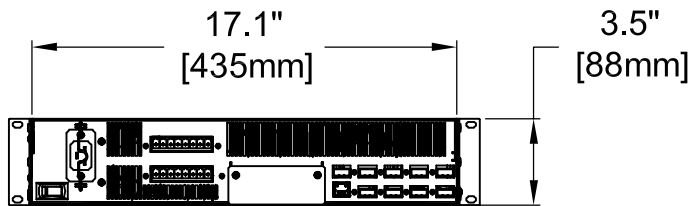


AC Current Draw and Thermal Dissipation Information

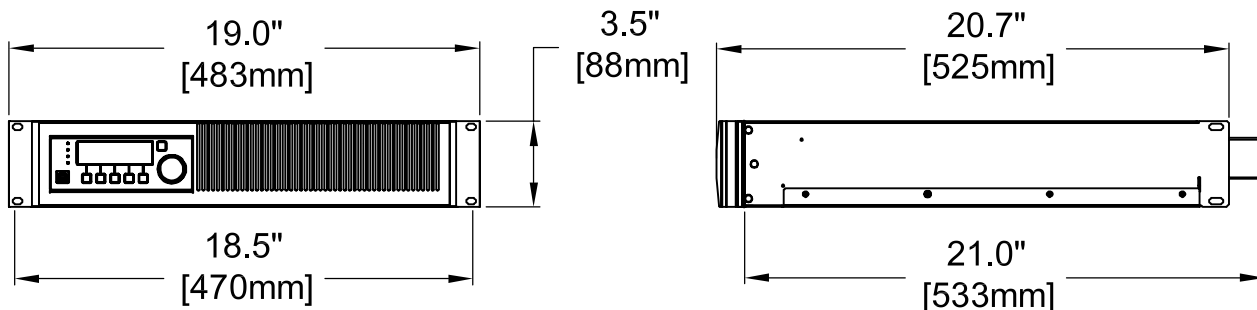
PM8500 / PM8500N, AC Current Draw and Thermal Dissipation							
Test Signal & Power Level	Load Configuration (All Channels Driven) (NR) = Not Recommended	Total Audio Output, W	120VAC 60Hz. Line Current, A	230VAC 50Hz. Line Current, A	Thermal Dissipation, Max		
					Watts	BTU/hr.	kCal/hr.
Idle (Standby, Networked)	N/A	0	0.25	0.13	31	106	27
Idle (Awake)	N/A	0	1.43	0.77	176	601	151
1/8th Rated Power IEC65 Bandlimited Pink Noise, 6dB Crest Factor	8Ω/Ch Mono 16Ω/Ch V-Bridge 8Ω/Ch Quad	300	4.18	2.18	202	689	174
	4Ω/Ch Mono 2Ω/Ch I-Share 8Ω/Ch V-Bridge 4Ω/Ch Quad	500	6.36	3.30	263	897	226
	2Ω/Ch Mono (NR) 1Ω/Ch I-Share (NR) 4Ω/Ch V-Bridge 2Ω/Ch Quad	500	6.70	3.42	304	1,037	262
1/3rd Rated Power IEC65 Bandlimited Pink Noise, 6dB Crest Factor	8Ω/Ch Mono 16Ω/Ch V-Bridge 8Ω/Ch Quad	800	9.01	4.61	281	959	242
	4Ω/Ch Mono 2Ω/Ch I-Share 8Ω/Ch V-Bridge 4Ω/Ch Quad	1,333	14.63	7.40	422	1,439	363
	2Ω/Ch Mono (NR) 1Ω/Ch I-Share (NR) 4Ω/Ch V-Bridge 2Ω/Ch Quad	1,333	15.35	7.77	509	1,736	438

TECHNICAL DATA SHEET

Mechanical Diagrams



Back View



Front View

Right View

PowerMatch™ PM8500 / 8500N configurable power amplifier



Architects' and Engineers' Specifications

The amplifier shall contain all solid-state circuitry, using MOSFET output devices employing Class-D topology with both current and voltage feedback loop circuits. The amplifier shall incorporate a switch-mode power supply with fast-tracking, power-factor correction circuits that will allow full-rated power from AC outlets ranging from 100 – 240 V, 50/60 Hz. The amplifier shall have an IEC 320-C19 16/20-amp electrical power inlet and shall be equipped with a removable power supply cord. The amplifier shall include protection from shorted and open loads, general overheating, DC, high-frequency overloads, under/over voltage and internal faults.

The amplifier shall contain eight independent amplifier channels, which can be configured to allocate the 4000 watts total rated output power between 2 and 8 channels. The amplifier shall contain variable speed fans, which are controlled by software to minimize acoustic noise. Fan airflow will be from the front panel to the rear panel. Rack mounting of multiple amplifiers shall be possible without extra rack spacing for ventilation. The amplifier shall be capable of continuous operation at 1/3 of rated power into 4-ohm loads, in ambient temperatures up to 104° F (40° C). The typical current draw at 1/3-rated power shall be 15 amps with 120 VAC and 7.5 amps with 230 VAC.

The power amplifier shall meet or exceed the following performance specifications:

- Input sensitivity for rated output: 0, +4, +12 and +24 dBu, user selectable
- Rated output power, per channel, with all channels driven and 0.4% THD (20 Hz to 20 kHz): Mono mode with up to 8 channels, 500 watts into 4 ohms and 300 watts into 8 ohms. Bridge mode with up to 4 channels, 1000 watts into 4 ohms, 8 ohms, or with 100-volt lines (at 1% THD), 800 watts with 70-volt lines (at 1% THD). Current-Share mode with up to 4 channels, 1000 watts into 2 ohms. QuadBridge™ mode with up to 2 channels, 2000 watts into 4 ohms or with 100-volt lines (at 1% THD), 1600 watts with 70-volt lines (at 1% THD)
- Frequency Response (± 0.5 dB at 1 watt): 20 Hz to 20 kHz
- Signal-to-Noise Ratio (1 dB below rated power, with +24 dBu input sensitivity) 100 dBA
- Total Harmonic Distortion (1 watt from 20 Hz to 20 kHz): less than 0.4%
- Intermodulation Distortion (SMPTE 60 Hz and 7 kHz): less than 0.4%
- Channel Separation (adjacent channels at 1 kHz): greater than 65 dB
- Damping Factor (10 – 1000 Hz, 4 ohms) greater than 1000

The amplifier shall incorporate eight balanced analog inputs, with rear-panel mounting and utilizing 3-pin terminal block connectors. The analog inputs shall support up to +24 dBu input signals. The amplifier shall support a digital expansion slot capable of receiving and transmitting 8 digital audio channels, using an optional digital expansion card, available in proprietary and industry-standard protocols. The amplifier outputs shall terminate with 8-pin, high-current, terminal-block connectors, which accept 10-22 AWG cables.

The amplifier shall include digital signal processing (DSP) optimized for loudspeaker processing, with 24-bit, 48 kHz

operation. The total latency (analog input to amplifier output) shall be 0.95 msec. The fixed-block signal processing shall include the following elements for each of the eight channels: 5-band parametric input EQ, array LF/mid-band compensation EQ, bandpass (crossover) filters, 9-band parametric output EQ, delay, output peak and RMS-average limiter. A matrix mixer shall be included for routing and attenuation of any input/output combination. A signal generator supporting tone, noise and sweep functions shall be included, which shall also enable the amplifier to measure and record automated impedance sweeps on any output channel.

The amplifier front panel shall contain a user interface with a 240 x 64 LCD primary display, with LED indicators for signal present, input clipping, output limiting and fault. Functions accessible from the front-panel interface shall include mute, input sensitivity selection, output attenuation, EQ on/off per channel and loudspeaker processing preset recall.

The amplifier shall contain a PC interface with a front-panel USB connection, which will allow amplifier setup, configuration and monitoring using Bose ControlSpace® Designer™ software (PM8500N model only: the network-version amplifier shall also contain a rear-panel Ethernet interface available from an RJ-45 connector to allow network control and monitoring of multiple network-version amplifiers when using a PC running Bose ControlSpace Designer software).

The amplifier chassis shall be constructed of steel with a durable black finish. The dimensions of the amplifier shall allow for 19-inch (483 mm) EIA standard rack mounting. The amplifier shall be 3.5 inches (88 mm) in height, and 20.7 inches (525 mm) in depth. The amplifier shall weigh 28 pounds (12.7 kg).

The amplifier shall be the Bose PowerMatch® PM8500 (PM8500N).

Additional Notes

Power rating:

Output power is measured per channel, all channels driven, using test signals at 1 kHz. *Table specification data noted with asterisk: configuration not recommended.

Audio Performance Specifications:

Measured at +24 dBu sensitivity unless otherwise specified.

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Product Codes

PowerMatch® PM8500

PowerMatch PM8500 - US	343547-1310
PowerMatch PM8500 - EU	343547-2310
PowerMatch PM8500 - JPN	343547-3310
PowerMatch PM8500 - UK	343547-4310
PowerMatch PM8500 - AU	343547-5310
PowerMatch PM8500 - NO CORD	343547-0310

PowerMatch® PM8500N (Network model)

PowerMatch PM8500N - US	343546-1310
PowerMatch PM8500N - EU	343546-2310
PowerMatch PM8500N - JPN	343546-3310
PowerMatch PM8500N - UK	343546-4310
PowerMatch PM8500N - AU	343546-5310
PowerMatch PM8500N - NO CORD	343546-0310

Accessories

PM ESPLink 8-Ch input card	349898 0010
PowerMatch® CobraNet® card	345975-0010