



PowerMax Ultra

Power Distribution Platform



Operation Manual Version 1.1
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Professional Sound Corporation
Printed in the U.S.A.

Thank you for purchasing the Professional Sound Corporation PowerMax Ultra power distribution platform. PSC is confident that the PowerMax Ultra has set new standards for clean, quiet powering of your portable audio equipment. Please feel free to contact us at the address below if you have any comments, suggestions, or questions about your new PSC PowerMax Ultra. Additionally, we are always open to suggestions for new products that you would like to see developed.

PSC extends a one-year parts and labor warranty to all PowerMax Ultra system owners who return their warranty card at the time of purchase. This warranty gives you specific rights, which are stated on the card, and enables us to keep you informed of product updates.

The PSC PowerMax Ultra provides all of the various voltages required to power your entire digital audio recording package. Its rugged design allows for complete confidence that you will have uninterrupted power throughout your recording sessions.

PLEASE BE SURE THAT YOU HAVE READ AND UNDERSTOOD THIS ENTIRE OPERATIONAL MANUAL BEFORE OPERATING THE PSC POWERMAX!

CAUTION! THE CASE OF THE POWERMAX ULTRA MAY GET HOT DURING USE. DO NOT ALLOW ANYTHING TO BLOCK THE COOLING FAN AND OTHER VENT OPENINGS. ALWAYS ALLOW AT LEAST A ONE INCH AIR GAP ABOVE THE COOLING FAN OPENINGS AND AROUND ALL VENT OPENINGS.

ALL AUXILARY EQUIPMENT SHOULD BE REVERSE POLARITY PROTECTED AND PROPERLY FUSED AT ALL TIMES.

THE POWERMAX ULTRA IS DESIGNED FOR USE WITH SEALED LEAD ACID BATTERIES AND IS FACTORY ADJUSTED FOR PROPER CHARGING OF SEALED LEAD ACID BATTERIES ONLY! PLEASE CONSULT THE FACTORY FOR USE WITH OTHER BATTERY TYPES. YOUR POWERMAX ULTRA MAY NEED INTERNAL ADJUSTMENTS TO BE COMPATIBLE WITH OTHER BATTERY TYPES.

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DESCRIPTION:

The Professional Sound Corporation PowerMax Ultra Power Distribution System has been designed and built specifically to provide clean, quiet power for your complete digital audio recording package. This new design easily handles the heavy power requirements of today's digital recorders and mixers. When connected to one or two sealed lead acid batteries it can output 12Vdc at up to 30 amps continuous, as well as 15 to 18Vdc (internally adjustable) to power your audio mixer and wireless receivers. In addition, the PSC PowerMax Ultra outputs 5 to 9Vdc (internally adjustable) for use in powering consumer digital recorders, small video monitors and other equipment. The PSC PowerMax Ultra contains two high capacity, on board battery chargers that are designed to operate from either 100Vac to 240Vac or from 127Vdc to 370Vdc for worldwide operation without adjustment. Each of the PSC PowerMax Ultra's 12 output connectors are equipped with dedicated EMI/RFI output filters to ensure clean, noise-free power for your equipment. In addition, each of the 12 output connectors are individually Polyfuse protected and is monitored for proper voltage output and over current faults. The status of all of these monitors can be viewed from the front panel BI-color LEDs. A green LED indicates proper operation, a red LED, indicates a tripped Polyfuse (overload condition).

CHARGING:

The PSC PowerMax Ultra contains two built in chargers designed to charge up to two external Sealed Lead Acid (SLA) batteries. That means you can connect either one or two separate SLA batteries to the PowerMax Ultra. These batteries can be 12V. 33AH Pelican battery boxes or large Deep Cycle batteries such as Optima Yellow Top batteries. The PSC PowerMax Ultra will operate from a wide range of AC or DC power so you can plug it in anywhere world without having to worry about making adjustments. The charger circuits used in the PowerMax Ultra have been specifically designed for charging the batteries while the batteries are in use powering low noise audio equipment. Unlike most battery chargers, ours have a very low noise floor. Using a typical 33amp/hour SLA battery you expect a recharge time of about 2.5 hours. Because of the two independent onboard chargers, when you are using two 33amp/hour SLA batteries, you can expect the same recharge time of about 2.5 hours. The charging function is automatic and thus, it does not require your assistance in any way. Simply plug the PSC PowerMax Ultra into an AC outlet, turn on the AC rocket switch located on the left side of the front panel and the charging begins. Beware that the PowerMax Ultra may get warm during use. Be careful when touching the surface of the PowerMax Ultra and be sure to allow ventilation air gaps around the top panel mounted ventilation fans and also around the sides of the Powermax Ultra for proper heat dissipation.

The PSC PowerMax Ultra is designed primarily for use with Sealed Lead Acid batteries. These batteries do not have the memory effects associated with NiCad batteries and unlike NiCads, SLA batteries life expectancy is based on how deeply it is discharged, how long it is left in that condition and the number of discharge cycles. Thus if you want to get the greatest life from your SLA batteries, you should keep them charged at all times. This is easily accomplished with the PSC PowerMax Ultra as it can be used while charging. The PSC PowerMax Ultra has a built in “fuel” gauge style battery meter that allows you to visually see the remaining battery capacity at a quick glance. The PowerMax Ultra is also designed to protect your batteries from over discharge. When your battery voltage drops to a pre-determined level (approximately 10.8Vdc) the PowerMax Ultra will automatically shut itself off and disconnect the load from the battery. Thus you cannot over discharge your batteries from misuse or by accidentally leaving your equipment on over a weekend, etc. The battery meter is also color coded from green to red as it falls from “FULL” towards “EMPTY”. When the last red LED turns off, so does the PowerMax Ultra.



PowerMax Ultra Battery “Fuel Gauge” – shown with batteries fully charged

Because the PSC PowerMax Ultra is equipped with such high capacity chargers, care must be exercised in the type and condition of batteries to be charged. The PowerMax Ultra is primarily designed to charge Sealed Lead Acid (SLA) batteries. Additionally, it is recommended that you **inspect your batteries weekly for any signs of damage such as case cracks, leaks or bulging cases. Do not connect the PSC PowerMax Ultra to batteries that are damaged, or beyond their recommended life span.** Failure to heed this warning could result in product damage and/or personal injury. Bulging battery cases are a sure sign of a damaged battery and/or shorted battery cell. Charging a battery in this condition can result in excessive heat build up and battery venting (hydrogen gas discharge and/or explosion). While charging, the sealed lead acid batteries should only get slightly warm to the touch. If they get very warm or hot, something is wrong and charging should be discontinued immediately and the batteries should be inspected.

VARIOUS CHARGER AND BATTERY CONFIGURATIONS:

Single Charger, Single 33AH Battery (1X Pelican Battery)



If you are primarily operating off AC and you only want to use a battery for short term back up power, then you may wish to use the PowerMax Ultra with only one 33AH pelican battery. When used with only one 12V, 33AH battery, your battery only run time may be anywhere from 2 to 5 hours depending upon your equipment's power requirements. We highly recommend that you use Pelican case batteries that are equipped with Neutrik Speakon connectors rather than 4 pin XLR connectors. Standard 4 pin XLR connectors are only rated for use at up to 9 amps of current. As the PowerMax Ultra can charge at up to 15 amps per battery connection, the use of Speakon connectors is highly recommended.

Dual Charger, Dual 33AH Batteries (2x Pelican Batteries)



One common approach is to use the PowerMax Ultra with two Pelican Batteries. In this case, you will have 66Amp Hours of power available and your run time on batteries only will be slightly better than double that of using only one battery. We highly recommend that you use Pelican case batteries that are equipped with Neutrik Speakon connectors rather than 4 pin XLR connectors. Standard 4 pin XLR connectors are only rated for use at up to 9 amps of current. As the Powermax Ultra can charge at up to 15 amps per battery connection, the use of Speakon connectors is highly recommended.

Dual Charger, Single, Large Capacity Battery (1X Optima Yellow Top Battery)



Note: Both Charger Leads Connected to One Battery

In some cases, you may wish to use one very large capacity battery with our new PowerMax Ultra. In this case you can configure both chargers to operate in tandem to charge the one battery. This will cut the charging time in half and also gives you the added benefit of having redundant chargers for reliability. **This**

“Dual Charger” mode should only be used with very high capacity batteries such as those with amp hour ratings of 55AH or higher. Generally speaking, we are describing full “car size” batteries and upward. Typically this includes deep cycle batteries such as Optima Yellow Top batteries. **DO NOT use this “dual charger” mode on typical 33 amp hour batteries found in Pelican cases as it may result in battery damage and or personal injury. These smaller capacity batteries will overheat when charged at such a high charge current and possibly explode.**

Dual Charger, Dual, Large Capacity Batteries (2x Optima Yellow Top Batteries)



This approach will provide the longest run time on batteries only and is recommended for equipment packages with very high current requirements and/or for applications that require very long run times on batteries only (No AC available). In this case, you will have up anywhere from 110 Amp Hours to 150 Amp Hours of power available to operate your equipment while on battery power only.

BATTERY STORAGE:

Always make sure to charge your batteries before putting them into storage. Your batteries should not be allowed to go below 10.6Vdc for any extended period of time. It will permanently damage them. Because all rechargeable batteries slowly self discharge while in storage, it is recommended that you charge them every two to three months when you are not using them for extended periods of time. This will ensure that the batteries never self discharge to a damaging level.

POWERMAX ULTRA USE:

The PSC PowerMax Ultra is designed for use in powering your entire digital audio recording package. The PowerMax Ultra's twelve (12), 4-pin female XLR output connectors provide all of the various output voltages at all times when the PowerMax Ultra is switched on. Thus all power cables wired for use between the PowerMax Ultra and your equipment must be wired correctly and professionally.

Anytime the PowerMax Ultra is plugged in and the AC power switch in "ON" its battery charger is turned on. Thus your batteries may be charged without the PowerMax Ultra's front panel electronics being turned on. By pressing the round, RED, "ON" button, the PowerMax Ultra will turn on and begin to supply all of the various output voltages to your equipment. If the PowerMax Ultra is connected to a battery, but not plugged into AC, all of the power will come from the battery. If the battery is discharged below a safe point, the PowerMax Ultra will not stay on when the "ON" button is pressed. If the battery level is good, the PowerMax Ultra will latch on. When the batteries are discharged to the point where the battery meter is reading empty, the PowerMax Ultra will automatically shut itself off. **You can also shut off the PowerMax Ultra at any time by simply pressing the GREEN, "OFF" button for approximately 7 seconds.** This "delayed" off function was designed into the PowerMax Ultra to prevent accidental shut off of your entire sound package should the "off" button be accidentally hit. You can also operate the PowerMax Ultra without batteries connected by simply plugging the PowerMax Ultra into AC and pressing the "ON" button. The PowerMax Ultra will output all of the various voltages and supply up to approximately 450 watts of total output power when connected to AC only.

OPERATING VOLTAGE: (100Vac to 240Vac or 127 to 370Vdc)

The PSC PowerMax Ultra has a "universal" input voltage and can even be operated from high voltage DC current. This design was chosen to facilitate the PowerMax Ultra operating worldwide with having to be adjusted. Simply plug it into a properly wired outlet and you are ready to go.

AC LINE SAFETY:

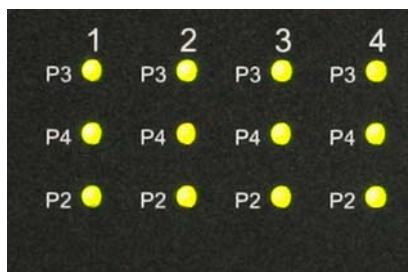
Electrical safety codes require that electrical equipment be properly grounded for operator safety. Many electrical outlets have been miss-wired with hot and neutrals reversed as well as having missing grounds. This is especially true on film sets where all power lines are portable and neutrals get kicked out time and time again. For your own safety and for the good of your equipment, you should test any AC line before connecting to it. This can be done by using a small, low cost line checker available at most hardware stores. These checkers look like an

AC plug with three or four lights on them that indicate when the AC outlet is wired correctly.

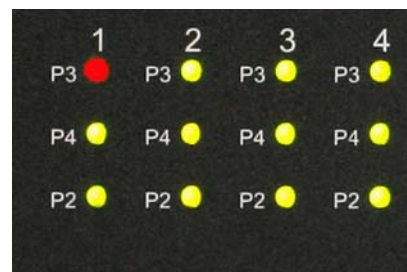
OUTPUT OVERLOAD PROTECTION:

The PSC PowerMax Ultra is equipped with Raychem Polyfuses that automatically reset to protect the outputs of the PowerMax Ultra and also to provide a degree of protection to your equipment. These solid state devices act like ordinary fuses or circuit breakers. They interrupt the flow of dangerously high electrical current in the case of a fault condition in the equipment being powered. The PSC PowerMax Ultra contains Polyfuses on its battery inputs, its voltage regulators and all 36 “hot” output voltage pins. The 36 separate Polyfuses that protect the 12 output connectors are monitored separately.

The front panel of the PSC Powermax Ultra has 36 BI-color LEDs that provide a convenient “quick glance” for user monitoring. Under normal operation, all 36 of these LEDs should be lit green. This indicates that there are no faults on any of the outputs. If any one of the LEDs has switched from Green to Red then that particular polyfuse has been tripped. Because there are individual LEDs monitoring the individual outputs, you can easily find out which output has the problem. For example, the LED for output number 2, has turned from Green to Red, you now know that whatever device you have plugged into output number 2 has a problem. Also, because each of the individual outputs is individually polyfuse protected, if any one piece of your equipment has a fault, the rest of your sound package will continue to operate. These Polyfuses will only reset after the fault has been removed and the Polyswitch allowed time to cool down (approximately 30 seconds). **Please note that these output protection devices should not trip during normal use of the PowerMax Ultra! If you experience tripping of these devices on any continuing basis, something is wrong and a qualified technician should check your equipment and cables immediately. Additionally, these polyfuses are rated at 4 Amps. This may be higher than is safe for various types of equipment. Always make sure your individual equipment is properly fused for its own protection.**



Example of Proper Operation



Example of Tripped Polyfuse
(Connector #1, Pin 3 Shorted)

Additionally, the PowerMax Ultra has internal fuses on the AC supplies that protect these main power supplies. These 5mm x 20mm white ceramic fuses are rated at 6.3 amps and are of the “slow blow” type. These fuses should not fail under normal operating conditions. If either of these fuses fail, please take your PSC PowerMax Ultra to a qualified technician for repair. Failure of these fuses or the power supply itself is indicated when the one or both of the front panel AC indicators is not lighted when the unit is connected to AC and the main power switch is turned on. These front panel indicators are labeled “AC1” and “AC2”

Safety note: There are no user serviceable parts within the PSC PowerMax Ultra. **Within the PSC PowerMax Ultra, there may be hazardous voltages present. Do not disassemble the PSC PowerMax Ultra. Refer all servicing to a qualified technician.**

PROPER POWERMAX ULTRA COOLING:

Your new PSC PowerMax Ultra is a high power device. It has a rated output of 450 watts. Although it has been designed using high efficiency switch-mode power supplies, the unit still does generate a considerable amount of heat when running at its full rated capacity. This heat must be dissipated for proper operation of the PowerMax Ultra. Because of this, the PowerMax Ultra is equipped with two, low noise Panasonic fans. These fans were chosen because of their efficient air moving abilities, quiet operation and super long life. In addition, these fans are operated at two different speeds. The low speed is used most of the time. Each of the two main switch-mode power supplies are equipped with thermostatic switches that are used to control the fan's operation. When either of the two power supplies reaches 120 Degrees F (49 C) the fans are automatically switched to operate at their higher speed for additional cooling.

SILENT OPERATION MODE:

There is a back panel mounted, “Fan Remote” connector that can be used to momentarily override and shut off the cooling fans. This logic level connector can be used to shut down the cooling fans during filming for completely silent operation. It can also be connected to many remote roll devices so you can automatically shut down the fans during every take. Whenever the “Fan Remote” shutdown is activated, a front panel mounted RED LED that is labeled “FAN OFF!”, will light, indicating that the cooling fans have been overridden (shut off).

The rear panel mounted “Fan Remote” connector is a 3 pin mini XLR connector. You can interface to this by using a Switchcraft TA3F connector wired as follows:

Pin 1 = (-) Negative

Pin 2 = (+) Positive

Pin 3 = 12Vdc

Applying 5Vdc to 12Vdc across pins 1 & 2 with the polarity indicated above will cause the Fans to be shutdown for Silent Mode Operation.

Please note that the Fans should only be overridden for short periods of time such as when filming a scene lasting from one to several minutes.

The PowerMax Ultra cannot be operated for long periods of time without the fans on. It will overheat and either shut down or be permanently damaged. Damage caused by heating due to customer miss-use of the fan overrides is not covered under the PowerMax Ultra Warranty.

The PowerMax Ultra is also equipped with a front panel mounted AC power switch. By turning this switch off, you are shutting down the chargers along with the fans. If you have long scenes to record and you have batteries connected to your PowerMax Ultra, then you can use the AC Power Switch as another way of shutting down the fans for silent operation. Please note that no battery charging is available when the AC switch is turned off. Because the PowerMax Ultra has such high capacity chargers, it can quickly recharge most batteries during breaks in filming, lunch breaks, wardrobe changes, etc.

EQUIPMENT POWER CABLES:

PSC recommends that you use only two conductor, unshielded 16AWG power cable for power distribution. Shielded cable is not recommended as the shield may cause short circuits between adjacent pins on the connectors.

NOTE: Use only the pins required for the correct voltage to operate your specific piece of equipment! For example, if your Miranda Mixer requires 12Vdc to operate, then you should only connect pins 1 (ground) and pin 4 (12Vdc). In this case you should not use pins 2 (6Vdc) or pin 3 (15Vdc) as these voltages are not required and could potentially damage your equipment. Many pieces of equipment use pins 2 and 3 for other functions such as battery charging. There are no industry standards for the use of pins 2 and 3. Their use may not be compatible with the PowerMax Ultra. **Remember, use only 2-conductor cable and wire only 2 pins on your connectors!** Please see examples below:

TYPICAL 12Vdc POWER CABLES:

For use with PSC Miranda Mixer, PSC M6 RetroMix, PSC RF MultiMax, PSC RF Multi Dual 1x8, Cooper CS208, Audio Developments Mixers, and most other audio mixers and recording devices that operate from 12Vdc and use a 4 pin XLR power connector.

POWERMAX ULTRA

MIRADA MIXER

4P MALE XLR

4 PIN FEMALE XLR

PIN 1-----PIN 1

PIN 4-----PIN 4

TYPICAL 15Vdc POWER CABLES:

For use with devices that use a 4 pin XLR power connector, but require a full 12Vdc or more to properly operate. This includes the Fostex PD4, Fostex PD6, Cooper CS106.

POWERMAX ULTRA

VARIOUS DEVICES (15V CABLE)

4P MALE XLR

4P FEMALE XLR

PIN 1-----PIN 1

PIN 3-----PIN 4

TYPICAL 6Vdc POWER CABLES:

POWERMAX ULTRA

SOME SMALL VIDEO MONITORS (NOT ALL....CHECK YOUR MANUAL)

4P MALE XLR

COAXIAL POWER PLUG

PIN 1-----OUTER RING

PIN 2-----CENTER PIN

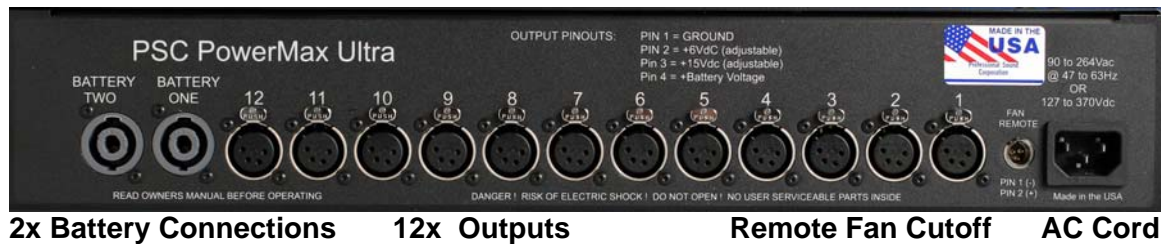
BATTERY POWER CABLES:

The cables used to connect the batteries to your PSC PowerMax Ultra are of special importance as they carry the entire electrical load of your sound recording package from the battery. In addition, they must carry the entire charge current to the battery. **The battery cables must be made from heavy gauge cable (12AWG) and kept as short as possible to eliminate voltage drops across the cable.** Because you are working with 12 volt batteries, the loss of even 1

volt across a cable run is unacceptable. We have equipped the PSC PowerMax Ultra with Neutrik Speakon connectors for use with your batteries. These connectors are rated for use up to 30 amps. Each PowerMax Ultra is supplied with a pair of cables terminated in ring lugs for use with your SLA batteries. We recommend that you have all your cables professionally built or buy specially built cables made by PSC from any authorized PSC dealer.

WARNING: It is highly recommended that you have your cables built by qualified personnel and tested prior to use with your PowerMax Ultra. All power cables should be clearly labeled on both ends as to what they are to be connected to. For example, label one end “PowerMax Ultra” and the other end “Miranda Mixer”. This will help prevent inadvertently connecting the cables to the wrong piece of equipment. We cannot stress enough the importance of good quality power cables and careful connections. Poorly constructed and/or labeled cables can result in equipment damage!

REAR PANEL CONNECTIONS:



WARNING!

THE PSC POWERMAX ULTRA OUTPUTS MULTIPLE VOLTAGES AT SUBSTANTIAL CURRENT AND VOLTAGES! ALL AUXILIARY EQUIPMENT SHOULD BE REVERSE POLARITY PROTECTED AND PROPERLY FUSED TO MANUFACTURERS RECOMMENDATIONS AT ALL TIMES! THE PSC POWERMAX ULTRA IS CAPABLE OF SUPPLYING MORE THAN 15 AMPS OF OUTPUT CURRENT INTO A SHORT CIRCUIT BEFORE THE INTERNAL POLYSWITCH TRIPS. THIS IS MORE THAN ENOUGH POWER TO SEVERELY DAMAGE UNPROTECTED EQUIPMENT!

DO NOT DISASSEMBLE THE PSC POWERMAX ULTRA! IT CONTAINS NO USER SERVICEABLE PARTS OR ADJUSTMENTS. HIGH VOLTAGE AND CURRENT MAY BE PRESENT. REFER ALL SERVICE TO QUALIFIED PERSONNEL ONLY.

TERMS OF USE:

THE IMPROPER CONNECTION OF THIS POWER SUPPLY TO AUXILIARY EQUIPMENT MAY RESULT IN DAMAGE TO SAID EQUIPMENT AND/OR PERSONAL INJURY. THIS PRODUCT IS DESIGNED TO BE OPERATED BY PROFESSIONALS IN THE FILM AND TELEVISION INDUSTRIES. THE PSC POWERMAX ULTRA SHOULD ONLY BE OPERATED AFTER READING AND UNDERSTANDING THIS ENTIRE INSTRUCTION MANUAL. THE OPERATOR OF THIS POWER SUPPLY ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR PROPER USE AND OPERATION OF THIS EQUIPMENT! PROFESSIONAL SOUND CORPORATION AND/OR ITS EMPLOYEES AND OFFICERS ASSUME NO RESPONSIBILITY OR LIABILITY FOR PERSONAL AND PROPERTY DAMAGE INCURRED DUE TO ACCIDENT, CARELESS HANDLING, ABUSE OR MISSUSE, IMPROPER CONNECTION, AND/OR INSTALLATION, IMPROPER ELECTRICAL CONTACT OR GROUNDING. OWNERSHIP AND/OR USE OF THE PSC POWERMAX ULTRA CONSTITUTES AGREEMENT WITH THESE TERMS.

SPECIFICATIONS:

Size:	17.25" x 13" x 3.00" (43.8cm x 33cm x 7.6cm)
Weight:	12Lbs (5.5Kg)
Input Power:	100Vac to 240Vac, or, 127Vdc to 370Vdc
DC Input Power:	SLA batteries, minimum capacity of 33Amp/hour each Pin 1 Ground Pin 2 +12Vdc
Total Output Power: (All outputs combined)	Pin 1 = Ground Pin 2 = +6Vdc @ up to 10 amps (adjustable 5 to 9Vdc) Pin 3 = +15Vdc @ up to 8 amps (adjustable 15 to 24Vdc) Pin 4 = +12Vdc (Battery Voltage) @ at up to 30 amps
Individual Outputs:	All individual outputs are polyfuse protected at 4 amps
Charging Time:	2.5 hours, typical per 33amp/hour battery, each output 5 hours, typical per 55 amp/hour battery, each output 2.5 hours typ, One 55amp/hour battery, Dual Charger Mode
Charger Type:	Constant Voltage Type, Current Limited to 15 amps, each charger. 30 amps total charging current available
Warranty:	Limited, One Year, Parts and Labor.

DECLARATION OF CONFORMITY

EMC: This product is in compliance with the Electromagnetic Compatibility Directive, 89/336/EEC as defined in EN 50081-1, EN55022 and EN 50082-1. IEC801-2, IEC801-3 and IEC801-4.

LVD: This product is in compliance with the requirements of the Low Voltage Directive, 73/23/EEC. 93/68/EEC as defined in EN60065, 1993 and/or EN60950/A1/A2/A3: 1995

TRADE NAME: PSC
MODEL: PowerMax Ultra

RESPONSIBLE PARTY: Professional Sound Corp.
28085 Smyth Drive
Valencia, CA 91355 USA

CONTACT PERSON: Ronald Meyer
(661) 295-9395

TYPE OF PRODUCT: Power Supply

MANUFACTURER: Professional Sound Corp.
28085 Smyth Drive
Valencia, CA 91355 USA

We hereby declare that the equipment bearing the trade name and model number listed above has been tested in accordance with the requirements contained in the above listed directives. All necessary steps have been taken and are in force to assure that production units manufactured will conform to Directive guidelines.

November 2006 Professional Sound Corporation.