Remote Power Supply

Installation Manual

PTI Integrated Systems
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I. Introduction.

The PTI Remote Power Supply converts 120 VAC power to 12VDC and is equipped with battery backup. The PTI Remote Power Supply comes in five sizes based on Amperage needed to support the system. PTI Remote Power Supplies also have a red reset button on the front that allows you to interrupt the power and battery backup to reset the entire system for troubleshooting purposes. The power supplies come in 1, 2, 4, 6, and 10 amp sizes. Multiple power supplies can be used to fit the needs of your particular setup.

II. Disclaimers and Warnings

We strongly recommend that installation and setup of any PTI equipment be done by a certified, licensed, qualified, and competent person. PTI Integrated Systems can recommend local dealers and installers, but it is up to the customer to verify their qualifications and negotiate any pricing or contracts unless PTI has been specifically contracted in writing to do so for the customer. These guidelines are subject to change without notice. With any setup or configuration, some troubleshooting and adjustment of the configuration may be required. This will differ with every installation depending on many outside and site-specific variables. This troubleshooting and configuration may include purchasing additional equipment. In no circumstances will PTI Integrated Systems be responsible for any damages either incidental or consequential based on these recommendations. All installation of electronics and electrical systems must be in compliance with local, municipal, state, and National Electrical Code.

Warning – Incorrect installation of electrical components can result in damage to electronics as well as personal injury.
Warning – Cross-wiring the AC power with DC power will damage the electronics.
Warning – Cross-wiring the positive and negative on the DC part of the system will damage the electronics.
Warning – Connecting 120VAC directly to the power supply circuit board bypassing the transformer will damage the electronics.

III. Installation Instructions

The following are instructions for installing a PTI Remote Power Supply to provide power for PTI Remote Access Devices. Please read this entire document before proceeding. Please follow these steps in order. Refer to the diagram on the back page to reference the steps. If you need assistance or have questions about this installation, please contact our technical support department by telephone at (480) 941-1513 or by email at support@ptiaccess.com.

1. Mount power supply case on the wall with solid anchoring devices that will safely support the weight of the power supply case and battery. PTI recommends that power supply battery and circuit board be left in the box as manufactured and not removed or installed separately. PTI Power Supply boxes are not weather proof and should be installed inside. PTI recommends all power supplies for a site be installed together, centrally located in the office or a maintenance room that will always be accessible (if feasible). Each Power Supply should be clearly labeled to show which remotes are powered from it with a note taped to the inside lid. If you are installing multiple power supplies, refer to the Multiple Power Supply Installation document available on our website or by calling technical support. Never power cameras, door strikes or sirens from the same power supply as remote keypads and multiplexers as these items can cause power spikes, under powering the other remotes. Power Supplies should be installed near a 120 V wall outlet.
2. Feed the Transformer Cable through one of the four knockouts on the sides of the power supply box using the correct bushing. On 1 and 2 amp power supplies, connect the transformer cable to the AC terminal connections on the power supply circuit board. Spade Connectors are required (do not wrap wires around terminal connections). The transformer cable should be two-conductor cable with 18 gauge or larger conductors. Larger gauge wire may be required with increased length. The transformer cable and spade connectors for 1 and 2 amp power supplies must be supplied by the installer. The larger 4, 6, and 10 amp power supplies have an internally mounted transformer which already has an electrical cord and plug attached.
3. Feed the system power wires through one of the four knockouts on the sides of the power supply box using the correct bushing. Connect system power wires to the stripped wires in the power supply box ('+' to '+' and '-' to '-'). This connection must be secured using wire nuts or crimped connectors and sealed with electrical tape (whenever possible, these splices should also be soldered for increased reliability). Warning - cross-wiring the positive and negative on the DC part of the system will damage the electronics.
4. When the entire access control system is wired up and ready for use, remove the plastic insulating cover from the positive battery terminal and connect the battery wires from the power supply circuit board to the battery terminals. Be sure to connect '+' to '+' and '-' to '-'. Warning - cross-wiring the positive and negative on the DC part of the system will damage the electronics. Do not connect battery until ready for use. Allow 48 hours of constant power for the battery to charge completely for battery back-up.
5. On 1 and 2 amp power supplies, connect the transformer cable to the transformer terminals. Spade Connectors are required (do not wrap wires around terminal connections). Polarity does not matter on the AC terminals or the transformer terminals. Warning – cross-wiring the AC power with DC power will damage the electronics. When the entire access control system is wired up and ready for use, plug the transformer into a 120 V outlet. Warning – do not connect 120VAC directly to the power supply circuit board bypassing the transformer as this will result in permanent damage to the electronics as well as personal injury. The Transformer can be plugged into a UPS (Uninterruptable Power Supply) or other surge protector for added surge protection. Do not plug the power supply into 120V until ready for use. On 1 and 2 amp power supplies, connect the large external transformer to the outlet using the screw provided on top of the transformer to prevent the transformer from falling out of the socket and removing power to the system. The larger 4, 6, and 10 amp power supplies have an internally mounted transformer with a standard electrical plug which does not have a screw mount as it is unlikely to fall out of the outlet due to its small size.

IV. Amperage Calculation

Use the chart below to verify that you have enough Amps to support the number of remote units that will be installed. Do NOT exceed the 75% load for the power supply. It is always better to have a higher amp power supply than is required as electronics will only pull the current that they need. Do not confuse Amps with Voltage which must not exceed the specifications. If you need assistance calculating your power needs, please contact PTI Technical Support.

Power Supply Size	Actual Amperage / mA	Maximum Limit (75% Load)*
1 Amp	1.2 A	900 mA
2 Amp	3 A	2250 mA
4 Amp	5 A	3750 mA
6 Amp	7 A	5250 mA
10 Amp	10 A	7500 mA

Remote Unit Type	Current Draw
Keypad or Keypad with Intercom	300 mA
CodeXpress with Intercom	300 mA
Apex Access Device	300 mA
Hardwired Multiplexer (16 - 96 Ch)	300 mA
Weigand**	300 mA**
8-Ch Relay Board	500 mA
Wireless Multiplexer	500 mA

Example – 1A power supply (900 mA max load) can support three keypads equaling 900 mA OR one keypad and one 8-Ch Relay Board totaling 800 mA. If you wanted to add any other remotes in either case, you would have to move to the next larger power supply OR add an additional 1A power supply. You would need a minimum of a 2A power supply to support two 8-Ch Relay Boards (total 1000 mA). If you are unsure, always use the next size larger remote power supply. It is always better to have more available amps than less as a remote will only draw to its capacity and no more.

* Do NOT exceed 75% load. This provides a safety zone to allow for most power spikes/surges without locking up or damaging the system.

** When powering other equipment such as door strikes, HID readers, maglocks, or sirens from a Weigand, be sure to consider the current draw specifications from that equipment as well.

V. Voltage Calculation

Most PTI Remotes require a minimum of 12V and a maximum of 18V to run (AC or DC). The PTI Power Supply is rated at a 12VDC output at the stated amperage. Multiple power supplies may be required to compensate for voltage drop over extremely long runs of wire or runs with multiple remotes. Be sure that there is a minimum of 12V at each remote. The table below shows the resistance per foot of wire for the cable that PTI sells. If you are using other wire, refer to the specifications provided by the manufacturer. PTI strongly recommends that you do NOT use wire gauges smaller than 18 AWG for power or data when installing our gate system. Larger gauges are acceptable (16, 14, 12, and 10). For documentation on calculating voltage drops, visit our web site at **www.ptiaccess.com** or contact PTI Technical support.

AWG	Ohms / 1000 Feet of wire	Ohms / 100 Feet of Wire	Ohms per foot of wire
18	6.920	0.692	0.00692
16	4.459	0.446	0.00446

VI. Battery Backup Calculation

Battery backup time is equal to the current draw (amps) multiplied by the amp hour rating of the battery. For example: if the system draws 2 amps and the battery is rated at 4 amp hours; the battery backup should last for 8 hours if the battery is fully charged and all other conditions are right (2 x 4 = 8). Certain external issues can influence this length of time, such as the age and condition of the battery, damage to the battery or power supply, power surges, and/or the level of charge in the battery. Also, each time the remote is used while the AC power is out will reduce the total backup time as the current draw increases slightly when the keypad is in use. For the battery backup function to be effective, the gate or door strike must also have a separately powered battery backup.

VII. Troubleshooting With LED Diagnostics

There are two Light Emitting Diodes (LED's) on the power supply circuit board that can be used for troubleshooting. The Red LED indicates DC power and the Green LED indicates AC power.

RED (DC)	GREEN (AC)	Troubleshooting Indication
ON	ON	Power Supply is operating normally
ON	OFF	Loss of AC Power. Battery Backup is supplying power
OFF	ON	No DC Output, indicating a short circuit or thermal overload
OFF	OFF	Loss of AC Power. Battery Backup not functioning – battery disconnected or discharged

VIII. Installation Diagram