

Total Access Rackmount 6-Amp Power Supply Battery Charger Installation and Maintenance Practice

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1. GENERAL

This practice provides installation and maintenance procedures for the ADTRAN Total Access® Rackmount 6-Amp Power Supply/Battery Charger, P/N 1180043L2. **Figure 1** is an illustration of the right and left side panels of the PS/BC.

Revision History

Issue 2 of this document provides additional wiring diagrams.

Features

The Total Access PS/BC features include the following:

- -54 VDC @ 6 amps output for multiple use
- Modular connections for two backup battery packs
- Modular power output connection
- LED status for VAC, VDC, and battery charging
- Full battery recharge in less than eight hours
- Two PS/BC configuration options available
- Fuse protection
- Positive ground
- Mounting hardware included
- Completely automatic operation

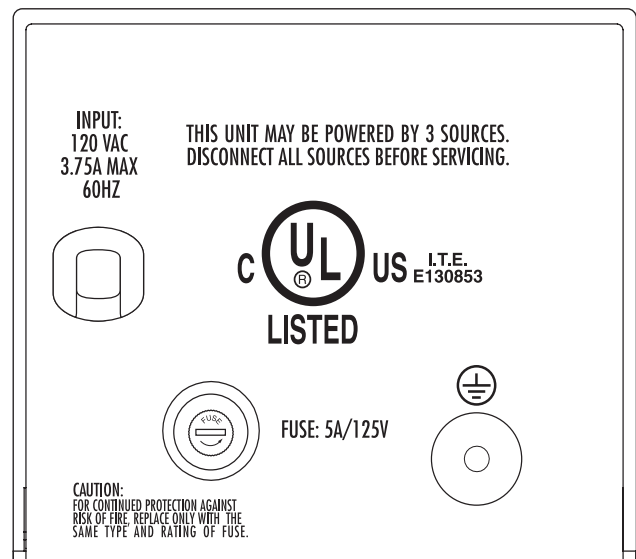
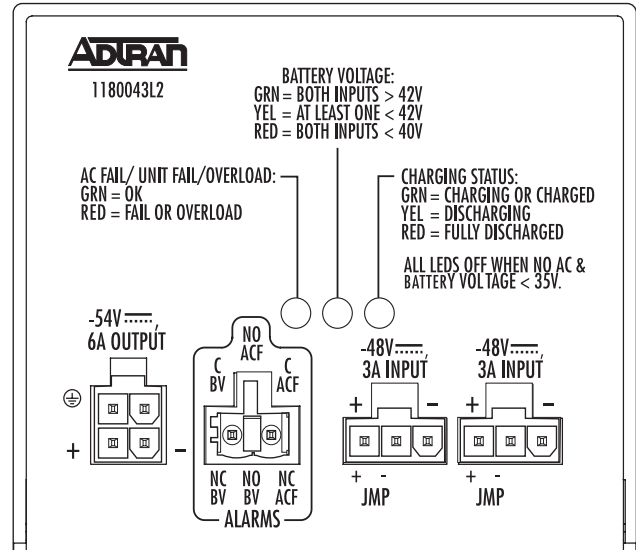


Figure 1. Total Access PS/BC

- Multiple protection features
- Uninterrupted power output if backup battery connected
- Meets NEBS Level 3 (all requirements of GR-63-CORE and GR-1089-CORE)
- FCC and UL 60950 compliant
- Industry leading 10-year warranty

Document Review

This document contains important pre-installation information. Craft personnel should review the entire document as part of installation planning.

2. DESCRIPTION

The PS/BC rectifier is part of the Total Access Rackmount AC Power Supply/Backup Battery System (APS/BBS). The unit is designed to work in conjunction with one or two ADTRAN backup battery packs, P/N 1175044L1.

Originally designed for the Total Access 1500 system, the PS/BC can be used in any application using 120 VAC input, and requiring up to -54 VDC, 6 amps output.

In the Total Access 1500 configuration, the rectifier performs AC to DC conversion and when used with the dual battery provides up to eight hours of backup power for a fully populated Total Access 1500 bank (96 FXS circuits) with up to 50 percent off-hook circuits at any one time.

For general use, the rectifier receives AC power from a standard 120 VAC wall outlet and converts this to -54 VDC, 6 amp output to the designated load plus recharging the single or dual battery, or maintaining battery at peak charge. Each battery has four series connected 12 volt rechargeable cells.

Single or Dual Battery

Each battery string is rated for 3 amps of current and 7 amp-hours of capacity. Dual batteries are required if the load exceeds these ratings during AC power failure (backup battery mode).

PS/BC Mounting location

The PS/BC normally mounts to the associated battery pack. The unit can also mount to a special bracket within a cabinet, or mount external to a cabinet against a wall.

Battery Disconnect Protection Circuit

During battery operation a protection circuit disconnects battery from the main output when battery voltage drops below 39 V, preventing over discharge. When AC returns, the main output provides regulated -54 VDC, batteries recharge, and the system returns to normal. Refer to LED descriptions for indication.

After the protection circuit initiates, the red LEDs remain ON continuing to slowly drain the battery. When battery voltage drops to 35 V, all load is removed from the battery. If AC power will not be available for

an extended period (several days), disconnect the battery to prevent unnecessary discharge.

DC Overvoltage Protection

The PS/BC has a protection circuit that disables the rectifier to protect the load from a high output voltage caused by rectifier failure. The backup battery or redundant PS/BC will support the load in this instance. The overvoltage event may permanently disable the PS/BC. Confirm this by performing the following procedure:

1. Disconnect the PS/BC from the AC source.
2. Wait 30 minutes minimum.
3. After 30 minutes plug back into the AC source.
4. If the unit has recovered, the AC LED will turn ON green and the unit returns to service. If the LED does not turn ON green, replace the PS/BC.

Alarm Relays

There are two uncommitted alarm relays associated with PS/BC operation:

- AC Fail (ACF): Alarms if AC fails, the rectifier overloads, or the rectifier fails.
- Battery Low Voltage (BV): Alarms if either or both battery voltage drops below 42 V.

Fuse

A standard 5x20 mm 5-amp fuse adjacent to the AC power cord protects AC power feed overload in case of rectifier failure.

LED Indication

A set of three PS/BC multi color LEDs provide status for AC, DC, and battery charge conditions. See **Table 1** for LED descriptions. Descriptions are also labeled on the PS/BC.

Table 1. LED Descriptions

LED	Color	Description
AC	Green Red	Normal 120 VAC operation AC fail, or rectifier overload or fail
Batt DC	Green Yellow Red	Batt 1 and 2 >42 VDC Batt 1 or 2 <42 VDC Batt 1 and 2 <40 VDC
Batt Chg	Green Yellow Red	Batt 1 and 2 charged or recharging Batt 1 or 2 discharging Batt 1 and 2 fully discharged
All LEDs	OFF	AC lost, Batt <35 VDC

Note: Descriptions are the same for a single battery.

Compliance

This device complies with Part 15 Class A of FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

3. INSTALLATION



After unpacking the Total Access Power Supply/ Battery Charger, inspect it for damage. If damage has occurred, file a claim with the carrier, then contact ADTRAN Customer Service (refer to *Warranty And Customer Service* on page 6).

Shipping Contents

The contents include the following items:

- Total Access PS/BC
- Appropriate wiring:
 - PS/BC to AC source (hardwired)
 - PS/BC to load
 - PS/BC alarm output
- Mounting hardware
- Total Access PS/BC 6-Amp Rackmount Practice Section

A PS/BC-to-PS/BC jumper cable can be separately purchased from ADTRAN, P/N 3127P086@A. The jumper cable configuration is discussed in Section 4.

Mounting the PS/BC

The PS/BC housing occupies a nominal area 15-1/2 inches wide by 3-1/2 inches high and is designed so the four mounting tab screw holes align to threaded screw holes on the ADTRAN battery pack housing. This procedure assumes that the battery pack is mounted in the designated 19-inch or 23-inch rack. Hardware for mounting the PS/BC to the battery pack is included. To mount the PS/BC:

1. Ensure a 120 VAC wall outlet is within reach of the PS/BC 10-foot power cord.

2. Determine the most convenient direction to view the status LEDs and position the PS/BC accordingly.
3. Align the mounting tabs to the threaded mounting holes on the battery pack.
4. Using the included “sems” screws with star washer, mount the PS/BC to the battery pack. Tighten fasteners firmly.

See **Figure 2** for a representative example of the PS/BC mounted to the battery.

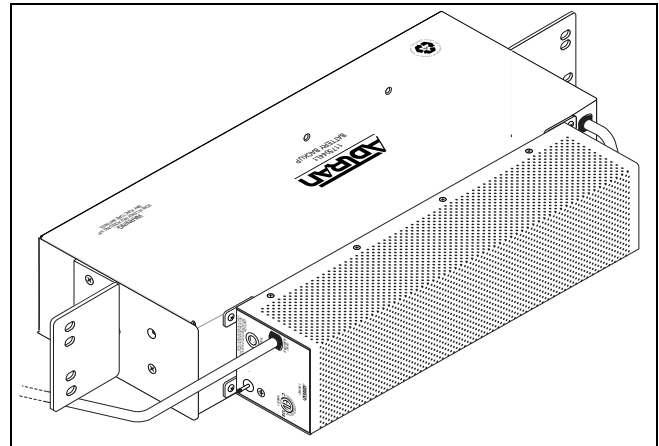


Figure 2. PS/BC Mounted On Battery Pack

Alternate Mounting

Two alternate mounting methods include mounting directly to a wall using customer supplied wood screws, or to a 16-gauge steel bracket (P/N 3265555) that mounts in the cabinet. Bracket mount location is normally at the battery position when batteries are mounted external to the cabinet. The bracket has threaded mounting holes that align to the PS/BC mounting tabs. The PS/BC can be mounted to either side of the bracket, or two PS/BCs can be mounted, one on each side. Openings in the bracket allow for wire management. Hardware for bracket mounting is purchased from ADTRAN. When determining the alternate mounting location, ensure supplied cabling reaches the designated termination point including dressing and lacing.

Provisioning

Aside from various PS/BC and battery mounting and wiring configurations, there are no end user controls, adjustments, or options associated with the PS/BC.

4. WIRING DESCRIPTIONS

The wiring required for the single PS/BC and dual battery configuration is included.

CAUTION

All grounds must terminate at a known ground location. Check metal-to-metal contact on all ground connections. Do not stack or combine grounds. Ensure ground circuit continuity.

Ground

A ground post adjacent to the PS/BC fuse is available for frame ground.

WARNING

Do not connect AC power or make battery connections until all other connections have been made for the designated installation and protective covers and shields have been installed.

120 VAC Power Input

AC input is through a 10-foot wire with a three prong grounded plug on the end. The line is hardwired to the PS/BC.

NOTE

In the optional two PS/BC configuration, a fully redundant system requires that each PS/BC have an independent AC source.

DC Power Output

The 4-foot long three conductor PS/BC power output wire originates at the -54V 6A OUTPUT modular connector and terminates at three #6 ring lugs for customer designated connection. Wire color-code is as follows:

- Red = -54 VDC
- Black = Return
- Green = Ground

PS/BC to Battery Configurations

The basic design configuration consists of one PS/BC with two batteries. A variety of other configurations are possible with more (or less) redundant capability, see **Figure 3** for standard configurations I, II, and III.

These would include one or two PS/BCs, none, one, or two batteries, or some combination of PS/BC and battery. The most reliable configuration would be two PS/BCs with two batteries each and with independent AC sources. The two PS/BC outputs would terminate at a single load that has primary and secondary power sharing terminals.

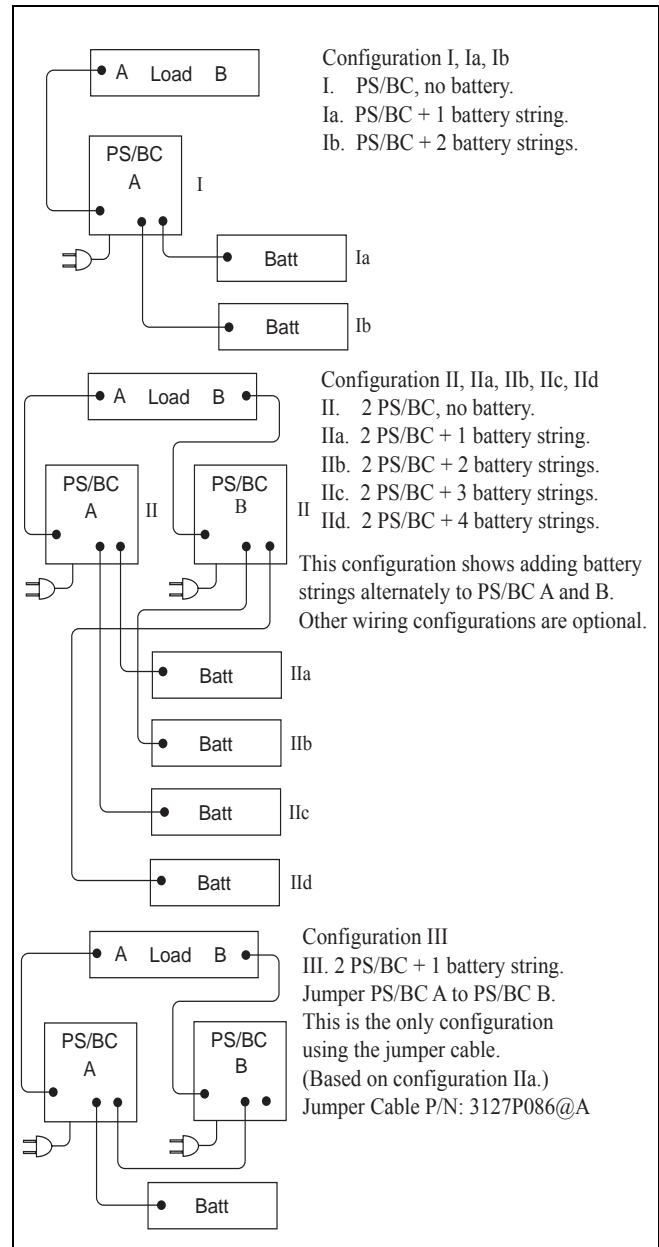


Figure 3. Wiring Block Diagrams

Battery Charge/Discharge

CAUTION

To prevent battery discharge prior to system operation, do not connect the battery to the PS/BC until AC power is connected or imminent.

Each battery has a hardwired 6-foot battery charge/discharge wire that originates at the battery housing and terminates at a modular connector. The PS/BC has two mating connector ports each labeled –48V 3A INPUT. It does not matter which battery connects to which port.

To prevent heat buildup the battery charge current is limited to 1 amp per battery. This eliminates the need for temperature compensation.

Dual PS/BC Jumper Cable

If a second PS/BC rectifier is intended (PS/BC #2), its power input and output is the same as the first PS/BC described previously.

NOTE

The purpose of the jumper cable is to provide battery backup to both PS/BCs if only one battery is used. If two batteries are used, each battery connects to a PS/BC and the jumper is not used.

A 6-foot jumper (JMP) cable (P/N 3127P086@A) with modular plugs at each end connects PS/BC #1 to PS/BC #2 through the –43V 3A INPUT ports. In this configuration (for instance) the single battery connects to PS/BC #1 at the inner battery port, the jumper connects to the outer port, and inserts into the inner port on PS/BC #2. The outer battery port on PS/BC #2 is not used. However, jumper connections can be made to any port. This configuration provides battery service if one or both PS/BCs fail.

NOTE

The dual PS/BC configuration does not necessarily use a single battery. A single PS/BC can use none, one, or two batteries. A dual PS/BC setup can use none or up to four batteries.

Alarm Wiring

The alarm relay output originates at a modular connector with a 6-foot wire stub. Wiring termination of the output is customer designated. The alarm outputs: AC Fail, Battery Low Voltage, are assigned the following wire color-codes:

- ACF = orange, orange/white
- BV = blue, blue/white

5. OPERATION

The PS/BC starts operation when AC or battery power is applied. During operation ambient temperature can increase up to 50°C without affecting output. If ambient temperature increases beyond 50°C, output must be derated. At 70°C ambient, output load is limited to 5 amps.

CAUTION

External PS/BC surfaces may become hot during operation above 50°C ambient temperature.

6. MAINTENANCE

The Total Access Power Supply/Battery Charger does not require maintenance for normal operation. ADTRAN does not recommend that repairs be attempted in the field. Repair services are obtained by returning the defective unit to ADTRAN. Refer to *Warranty And Customer Service* on page 6.

Fuse

If the fuse fails, replace with a fuse of identical type and rating.

7. SPECIFICATIONS

Specifications for the Total Access PS/BC are listed in **Table 2**. Power Factor specifications are listed in **Table 3**.

Table 2. PS/BC Specifications

Environmental	
Operating Temperature:	-40°C to 50°C
Derated Operation, Linear:	50°C to 70°C (0.05 Amp/°C)
Storage Temperature:	-40°C to 85°C
Relative Humidity:	95 percent noncondensing
Max Heat Dissipation:	29 Watts @ 325 Watts output 50 Watts maximum during overload
Physical	
Dimensions:	3.45-in. H 15.35-in. W (includes mounting tabs) 2.92-in. D
Weight:	5.5 lb.
Electrical	
AC Input:	120 Volts, 3.75 Amps max, 60 Hz
DC Output:	-54 Volts, 6 Amps
Max power up to 50°C:	6 Amps
Max power @ 70°C:	5 Amps
Power Output:	325 Watts
Compliance	
NEBS:	Level 3+
UL:	60950
ETL:	Listed
FCC:	Part 15, Class A

Table 3. Power Factor & Efficiency

Power Output vs. Efficiency			
Power Output	Power Factor	Efficiency	Power Dissipation
50 Watts	>98%	>81%	11 Watts
150 Watts	>99%	>89%	18 Watts
325 Watts	>99%	>91%	29 Watts

8. WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found at www.adtran.com/warranty.

U.S. and Canada customers can also receive a copy of the warranty via ADTRAN's toll-free faxback server at 877-457-5007.

- Request document 414 for the *U.S. and Canada Carrier Networks Equipment Warranty*.
- Request document 901 for the *U.S. and Canada Enterprise Networks Equipment Warranty*.

Refer to the following subsections for sales, support, CAPS requests, or further information.

ADTRAN Sales

Pricing/Availability:
800-827-0807

ADTRAN Technical Support

Pre-Sales Applications/Post-Sales Technical Assistance:

800-726-8663

Standard hours: Monday - Friday, 7 a.m. - 7 p.m. CST
Emergency hours: 7 days/week, 24 hours/day

ADTRAN Repair/CAPS

Return for Repair/Upgrade:
(256) 963-8722

Repair and Return Address

Contact Customer and Product Service (CAPS) prior to returning equipment to ADTRAN.

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