AC/DC Power Supply and Battery Charger Installation and Maintenance

CONTENTS

FIGURES

TABLES

1. GENERAL

This practice provides installation and maintenance procedures for the ADTRAN ™ AC/DC Power Supply and Battery Charger (PS/BC). Figure 1 is a front and back illustration of the PS/BC.

Revision History

This is the initial release of this document. Future revisions will be made in this subsection.

Features

Features of the PS/BC, P/N 1175043L3, include the following:

- Compact design.
- Versatile mounting arrangements.
- All mounting hardware included.
- Built-in fuse.
- Multi-feature status LED.
- Modular connections.
- Positive ground.
- Uninterrupted power output (if battery backup connected).
- FCC and UL 60950 compliant.
- Complies with GR-1089-CORE and GR-63-CORE.

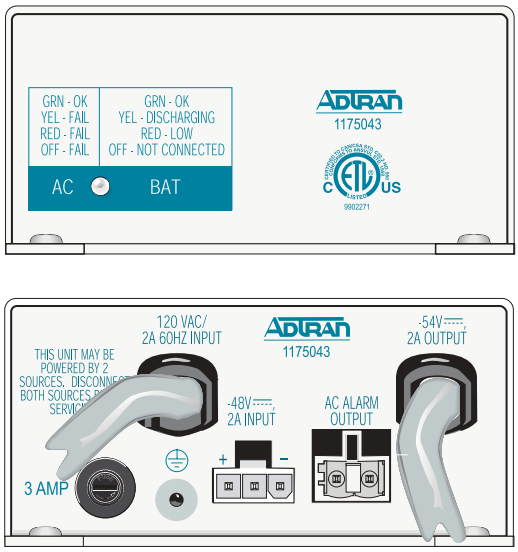

Figure 1. AC/DC Power Supply and Battery Charger

2. DESCRIPTION

The AC/DC PS/BC provides -54 VDC to the Power Supply unit in various supported product systems. The PS/BC receives 115 VAC through a standard plug and wall socket. Some of the more common supported ADTRAN systems include:

- Total Access 750/850
- Total Access OPTI-3
- MX2800/2810
- NIU3 (single mount housing, 3-slot shelf, 12-slot shelf)
- Battery Backup Units

Refer to your product documentation to verify compatibility with the PS/BC.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference that may cause undesired operation.

Changes or modifications not expressly approved by ADTRAN could void the user's authority to operate this equipment.

Fuse

A 3 Amp fuse on the back panel protects the unit from over current. The fuse isolates the AC input from the power supply in the event of a fault. The fuse is replaced by twisting the

black cap to the left and pulling the fuse out. After the new fuse is inserted, the cap is pushed back in and turned to the right.

Status LED

A single multi-feature LED on the front panel provides AC operation or battery operation power status. Refer to Table 1 for indication descriptions.

Table 1. LED Indication

AC Power Operation		Battery Operation	
Green	OK	Green	OK (charging)
Yellow	Power Fail	Yellow	Discharging
Red	Power Fail	Red	Low (< 40V)
Off	Power Fail	Off	Disconnected

3. INSTALLATION

CAUTION

This equipment MUST only be installed in a DC-C bonding and grounding environment per Telcordia GR-1089-CORE, Issue 3. It may not be utilized in a DC-I (isolated) bonding and grounding environment.

SAFETY INFORMATION

When using your telephone equipment, please follow these basic safety precautions to reduce the risk of fire, electrical shock, or personal injury:

1. Do not use this product near water, such as a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
2. Avoid using a telephone (other than a cordless-type) during an electrical storm. There is a remote risk of shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord, power supply, and/or batteries indicated in the manual. Do not dispose of batteries in a fire; they may explode. Check with local codes for special disposal instructions.

ELECTROSTATIC INSTRUCTIONS

CAUTION

Electronic equipment can be damaged by static electrical discharge. Before handling equipment, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place equipment in antistatic packing material when transporting or storing. When working on equipment, always place them on an approved antistatic mat that is electronically grounded.

After unpacking the unit, inspect it for damage. If damage is noted, file a claim with the carrier then notify ADTRAN Customer Service.

MOUNTING AND WIRING INSTRUCTIONS

The following are mounting instructions for the AC/DC PS/BC when utilized with some of the various ADTRAN product systems. If your ADTRAN system is not listed in this section, please refer to the documentation provided with your ADTRAN product system for more detailed instructions.

Wallmounting

For the wallmount arrangement, the PS/BC is normally installed on the designated 3/4-inch or thicker plywood with four #6 by 3/4-inch flat-head wood screws. Installation is as follows:

1. Determine the preferred layout and ensure the socket-outlet is located near the equipment and easily accessible.
2. Ensure the unit is plumb, then mark through the four screw holes to identify where the pilot holes will be drilled.
3. Using a 1/16-inch bit, drill pilot holes at the marked locations.
4. Mount the unit using the pan-head screws.
5. Route and connect all cabling to the appropriate device. Use cable tie-downs as needed.
6. Connect the ground stud using the most direct route to a known equipment ground source.

Total Access 750/850

Mounting

Mount the power supply on the left side of the Total Access 750/850 shelf (next to the battery cover hinge) for battery backup installations (P/N 1175044L2 and 1175044L4)

Position the Total Access PSU (power cords oriented downward) and align all four holes (on the tabs at the corner of the Total Access PSU) with the four available machined holes on either side of the Total Access 750/850. Use four #6 3/8-inch machine screws (provided) to secure the Total Access PSU. Alternately, the Total Access PSU can be mounted to a backboard with four #6 3/4-inch wood screws (not supplied).

Wiring

Before beginning the wiring connection, verify that the Total Access 750/850 and the AC/DC Power Supply and Battery Charger are properly grounded with the required supplemental ground.

Power should be the last connection made during installation.

The Total Access PSU has two cords (AC plug and 4 position modular adapter). Insert the Total Access PSU modular

adapter into the receptacle provided on the back of the Total Access 750/850 and plug the AC plug into the AC power source.

Total Access OPTI-3

Mounting

An additional cable (ADTRAN P/N 1200657L10) is required for connecting the PS/BC to Total Access OPTI-3 systems.

Rackmounted Systems

Use a mounting bracket and secure the Total Access PSU to the rack (19" bracket–P/N 1175050L1, 23" bracket–P/N 1175051L1). Orient the Total Access PSU with the cables facing away from the center and secure it with four #6 3/8-inch machine screws. A single bracket mounts up to 4 Total Access PSUs. Alternately, mount the Total Access PSU directly to the rack (or a backboard) using two or more of the mounting tabs.

Wallmounted Systems

Position the Total Access PSU (power cords oriented downward) and align the outer two holes (on the tabs at the corner of the Total Access PSU) with the two available machined holes on either side of the Total Access OPTI-3. Use two #6 3/8-inch machine screws (provided) to secure the Total Access PSU.

Wiring

The Total Access PSU (when ordered for use with these systems) is shipped with an adapter cable (ADTRAN P/N 1200657L10) that has a molded modular connector on one end and three ring type terminals on the other (see Figure 2).

Figure 2. Cable for OPTI-3, MX2810, and NIU3

The Total Access PSU powers a single bus (select either A or B). Connect the ring-type terminals to the respective terminals on the rear of the chassis using the screws provided. Use the following wiring conventions:

RED	-48VA or PWR
BLACK	RET
GREEN	Ground Terminal

Table 2. Wiring (OPTI-3, MX2810, NIU3)

Connect the DC wiring harness of the Total Access PSU to the adapter using the modular connectors and plug the AC plug into the AC power source.

MX2810 and NIU3 Systems

Mounting

An additional cable (ADTRAN P/N 1200657L10) is required for connecting the PS/BC to MX2810 and NIU3 systems.

Rackmounted Systems

Use a mounting bracket and secure the Total Access PSU to the rack (19" bracket–P/N 1175050L1, 23" bracket–P/N 1175051L1). Orient the Total Access PSU with the cables facing away from the center and secure it with four #6 3/8-inch machine screws. A single bracket mounts up to 4 Total Access PSUs. Alternately, mount the Total Access PSU directly to the rack (or a backboard) using two or more of the mounting tabs.

Wiring

The Total Access PSU (when ordered for use with these systems) is shipped with an adapter cable (ADTRAN P/N 1200657L10) that has a molded modular connector on one end and three ring type terminals on the other (see Figure 2).

The Total Access PSU powers a single bus (select either A or B). Connect the ring-type terminals to the respective terminals on the rear of the chassis using the screws provided. Use the wiring conventions in Table 2.

Connect the DC wiring harness of the Total Access PSU to the adapter using the modular connectors and plug the AC plug into the AC power source.

MX2800

Mounting

An additional cable (ADTRAN P/N 1200657L2) is required for connecting the PS/BC to MX2800 systems.

Rackmounted Systems

Use a mounting bracket and secure the Total Access PSU to the rack (19" bracket–P/N 1175050L1, 23" bracket–P/N 1175051L1). Orient the Total Access PSU with the cables facing away from the center and secure it with four #6 3/8-inch machine screws. A single bracket mounts up to 4 Total Access PSUs. Alternately, mount the Total Access PSU directly to the rack (or a backboard) using two or more of the mounting tabs.

Wiring

The Total Access PSU (when ordered for use with this system) is shipped with an adapter cable (ADTRAN

P/N 1200657L2) that has a molded modular connector on one end and four soldered wire tips on the other (see Figure 3).

Figure 3. Cable for the MX2800

Connect the soldered ends of the wires to the modular connector that fits into the chosen power bus using a small slotted screwdriver. (The power buses are labeled A and B on the rear of the chassis.) Use the following wiring conventions (holding the connector as it will be inserted in the chassis):

Left	WHITE	Battery Backup Alarm Wire
	RED	Negative Terminal Wire
	BLACK	Positive (RET) Wire
Right	GREEN	Ground Terminal Wire

Secure the ends of the wires and plug the connector into the chassis on the desired power bus (A or B). Connect the other end to the DC wiring harness of the PSU wiring harness and plug the AC plug into the AC power source.

Battery Backup Units

Mounting

When using the PS/BC in conjunction with available ADTRAN Battery Backup Units (BBUs), one of the following mounting options should be used:

- Wallmounting the PS/BC (refer to *Wallmounting* on page 2).
- Mounting the PS/BC to the product chassis containing the DC power supply.
- Mounting the PS/C to the BBU.

Refer to your specific ADTRAN product system documentation to determine the optimal mounting solution for your system.

GROUNDING INSTRUCTIONS

For complete details on product grounding requirements, refer to the Network Turnup Procedure in your product System Manual.

GR-1089-CORE Requirement

An equipment grounding conductor that is not smaller in size than the ungrounded branch-circuit supply conductor is to be installed as part of the circuit that supplies the product or system.

The ground connector on the PS/BC provides an additional ground reference (the third prong of the AC plug is also grounded) and may be connected to the "ground bus" or "ground wire" in a customer equipment room. 18 AWG or larger ground wire is recommended.

4. BATTERY BACKUP OPERATION

The following information is applicable when using the PS/BC with any available ADTRAN BBU.

Alarm and Battery Disconnect Relays

Two relays support Power Supply operation:

- Alarm relay
- Battery disconnect relay

Alarm Relay and Alarm Signal

The Alarm relay is provided for customer use. In normal operation the contact alarm relay is open. If an AC power failure occurs and the unit defaults to the battery backup, the relay will cycle open.closed once per second (that is one second open then one second closed). The tolerance on this cycle time is 25 percent.

This indicates the battery is discharging in support of the load. If battery voltage decreases to 45 V the relay stays closed to indicate the battery is becoming depleted. The relay will open automatically when normal AC voltage is restored. Table 3 summarizes the alarm relay operation.

Table 3. Alarm Relay Operation

Condition	Alarm Relay
Normal	Open
AC Power Failure/Battery Backup engaged	Cycles open/closed once per second
Battery voltage is less than 40V	Stays closed

An alarm signal that cycles synchronously with the alarm relay is provided on the output cable. This signal, which is open during normal operation, cycles between open and ground during battery backup (as described for the alarm relay), and is ground when the battery voltage falls below 45V.

Battery Fail Alarm

For battery backup systems that employ the optional Battery Test Assembly an alarm signal is provided to the PS/BC that indicates a failed battery (in need of immediate replacement). This signal is passed to the Alarm Relay and Output Alarm Signal. When a failed battery is detected, it is indicated by the Alarm Relay cycling open for 450 ms, then closed for 450 ms. Battery failure is also indicated by the output alarm signal cycling open to ground at the same rate.

Battery Disconnect Relay

The battery disconnect relay disconnects the battery pack from the system if the battery voltage falls below 40 VDC. This feature prevents damage tot he batteries. The batteries

will be recharged when normal AC voltage is restored and the relay will close when the battery voltage exceeds 40V.

Certain alarm features on the power supply are still powered by the battery after the disconnect relay is opened. These features slowly drain the battery. If it is known that AC power will be unavailable for an extended periods (greater than a week), ADTRAN recommends that the battery be disconnected from the power supply to prevent over-discharge.

5. COMPLIANCE CODES

Code	Input	Output
IC	F	C
TC	—	—
PC	R	—

6. MAINTENANCE

The AC/DC Power Supply and Battery Charger does not require routing maintenance for design operation.

ADTRAN does not recommend that repairs be attempted in the field. Repair services are obtained by returning the defective unit to ADTRAN Customer Service.

7. WARRANTY AND CUSTOMER SERVICE

All Total Access Battery Backup systems have a 10 year warranty coverage on the product. This includes cables, housings, PCBs, and any other ADTRAN-built components (excluding lead acid batteries).

ADTRAN will repair and return this product within 10 years from the date of the shipment if it does not meet its published specifications or fails while in service (see A*DTRAN Equipment Warranty, Repair, and Return Policy and Procedure*, document 60000087-10A).

For service, CAPS requests, or further information, contact one of the following numbers:

ADTRAN Sales

Pricing and Availability
(800) 827-0807

ADTRAN Technical Support

Pre sales Applications/Post-sale Technical Assistance
(888) 4-ADTRAN

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

ADTRAN, Inc.
CAPS
901 Explorer Boulevard
Huntsville, Alabama 35806-2807