

Modular Power Distribution Unit, Remote Power Panel, Rack Distribution Panel

Operation

PDPM138H-5U, PDPM138H-R, PDPM72F-5U, PDPM277H, PDPM144F

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Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in death or serious injury.**

Failure to follow these instructions will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in death or serious injury.**

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in minor or moderate injury.**

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

This manual contains important instructions that must be followed during installation, operation, and maintenance of the PDU. For safety reasons, only trained users are allowed to operate the display interface and replace the Power Distribution Modules (PDMs).

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- The PDU must be installed in accordance with the National Electrical Code or the Canadian Electrical Code and all applicable local codes.
- Service access areas are locked with a Red Key. The Red Keys must remain under the control of qualified service personnel.
- Wear appropriate personal protection equipment (PPE) when performing maintenance on this PDU.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

To remove a Power Distribution Module:

- Turn off all power supplying the equipment and perform appropriate lockout/tagout procedures before installing or removing the Power Distribution Module. OR
- If a Symmetra PX UPS is providing power to the Modular PDU, place the UPS into battery operation (to reduce fault current) before removing the Power Distribution Module. To place the UPS into battery operation, see the UPS Operation Manual.

Failure to follow these instructions will result in death or serious injury.

WARNING

UNEXPECTED BEHAVIOR OF APPLICATION

Only trained users should operate the display or replace the Power Distribution Modules.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CAUTION

HAZARD OF EQUIPMENT DAMAGE

- For PDMs with Residual Current Devices (RCDs) installed, the occurrence of a ground fault will automatically open the adjacent circuit-breaker.
- PDMs with RCDs are equipped with a test button. Periodic testing of the RCD may be required. Check local codes for your region.

Failure to follow these instructions can result in injury or equipment damage.

Regulatory Agency Approval

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is

operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the installation guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

This class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This is a class A product. In a domestic environment this product may cause interference in which case the user may be required to take adequate measures.

Additional Safety Information

Before You Begin

Verify that the system is free from all short circuits and grounds, except those grounds installed according to local regulations (according to the National Electrical Code in the U.S.A., for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Perform all start-up tests recommended by the manufacturer.

Operation and Adjustments

The following precautions are from the NEMA Standards Publication ICS 7.1-195 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- It is possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and other equipment used with this product.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

▲ WARNING

UNGUARDED MACHINERY HAZARD

- Do not use this product with equipment which does not have point-of-operation protection.
- Do not reach into equipment during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Commissioning

Pre-Start Checklists

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Procedures in this section should only be performed by qualified personnel.
- Equipment must be properly de-energized and locked-out prior to performing service.

Failure to follow these instructions will result in death or serious injury.

After installation, verify that all components are working properly and that the equipment is ready to begin operation.

Initial Inspection Checklist

Ensure the:

- Installation procedure is complete according to the installation manual.
- Equipment shows no signs of damage.
- Clearance around the equipment is in accordance with local and national codes and regulations as well as the installation manual.
- Equipment is leveled and joined to the adjacent racks as specified in the installation manual.

Electrical Inspection Checklist

Ensure the:

- Incoming voltages match the phase and voltage listing on the nameplate.
- Electrical wiring complies with local and national codes and regulations.
- Equipment is properly grounded.
- All field electrical connections are tight.
- Circuit breakers are correct.

User Interface Inspection Checklist

Ensure the:

- The building management system is connected correctly.
- The network port is connected correctly and an IP address has been assigned to the equipment.

Final Inspection Checklist

Ensure the:

- System is clean and free from debris.
- Packaging materials are disposed off properly.

Start-up Inspection Checklist

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

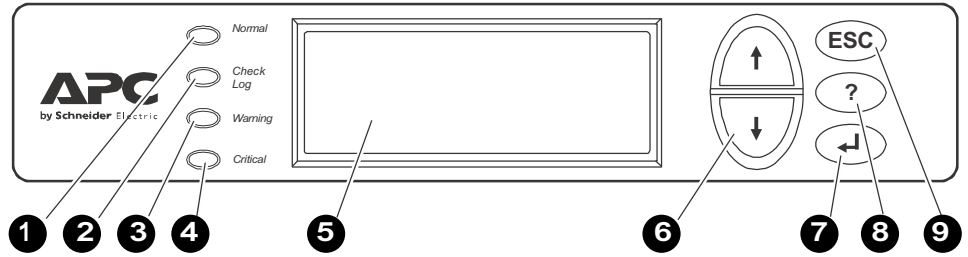
- Procedures in this section should only be performed by qualified personnel.
- Wear appropriate personal protective equipment (PPE) when checking hazardous voltages.

Failure to follow these instructions will result in death or serious injury.

- Verify that the PDU is in Total Power OFF mode.
- Set all modules that will be used to ON:
 - Power up the PDU.
 - Make sure the incoming power circuit breaker is set to ON.
 - If applicable, set the Subfeed circuit breaker to ON.
- Verify that the display interface is working properly.
- Verify through the display interface that the PDU sees the correct number of power modules.
- Using a phase rotation meter, verify phase rotation.
- Resolve any unexpected alarms.
- Configure the date and time through the display interface.
- Review the Event Log.
- Check for abnormalities in the log.
- Resolve any abnormalities in the log.
- Clear the Event Log when you are finished.

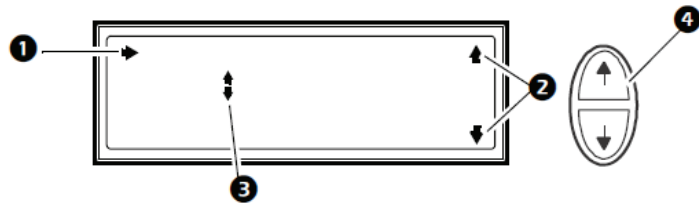
Operation

Display Interface



1	Normal LED	Green = no alarms are present.
2	Check Log LED	Green = a new event has been added to the log.
3	Warning LED	Yellow = there are one or more active warning alarms in the system.
4	Critical LED	Red = there are one or more active critical alarms in the system.
5	LCD Screen	Displays alarms, status data, instructional help, and configuration items.
6	UP and DOWN keys	Used to scroll through menu items.
7	ENTER	Press to display new screens, open menu items, and finalize selections.
8	? - HELP	Press to open content-sensitive help.
9	ESC	Press to return to the previous screen.

Navigate the Display Interface



1. Selector arrow. Press the UP or DOWN arrow key **4** to move the selector arrow to a menu option or setting. Press the ENTER key to view the selected screen or modify the setting.
2. Continue arrows. Indicate that additional screens are available on a menu or status screen. Press the UP or DOWN arrow key to view the additional items.
3. Input arrows. Input arrows next to a selected setting indicate that the setting can be modified by pressing the UP or DOWN arrow key. Press the ENTER key to save the change or the ESC key to cancel.
4. Press the UP or DOWN arrow key to:
 - a. navigate the selector arrow through the menu prompts
 - b. change the target item
 - c. edit a text string. Press the UP or DOWN arrow key to change the character in the text string.
Press ENTER to confirm and advance to the next character.

Top Dynamic Display

When the system is running, the display interface will automatically scroll through a series of screens showing general information about the PDU and any active alarms on the system.

You can press the UP or DOWN arrow keys to manually scroll through these screens.

Press ENTER at any time to go to the main menu screen.

If the display interface is inactive for the duration of a user-configured time-out setting, it will return to the top dynamic display.

Overview Screens (No active alarms)

```
No Active Alarms

System Date/Time:
28-May-2012 10:37:01
```

Out	Amps	kW	kVA
L1:	0.0	0.00	00.0
L2:	0.0	0.00	00.0
L3:	0.0	0.00	00.0

```
Output Voltage
L1: 00V L1-2: 0V
L2: 00V L2-3: 0V
L3: 00V L3-1: 0V
```


Overview Screen Alarm Shown

```
Active Alarms: 1 of 15
Communication Lost
With Metering Board
[1.6]
```

Main Menu Screen

The main menu screen is the top-level screen on the display interface. The main menu contains six submenus that allow you to monitor and configure specific aspects of the system.

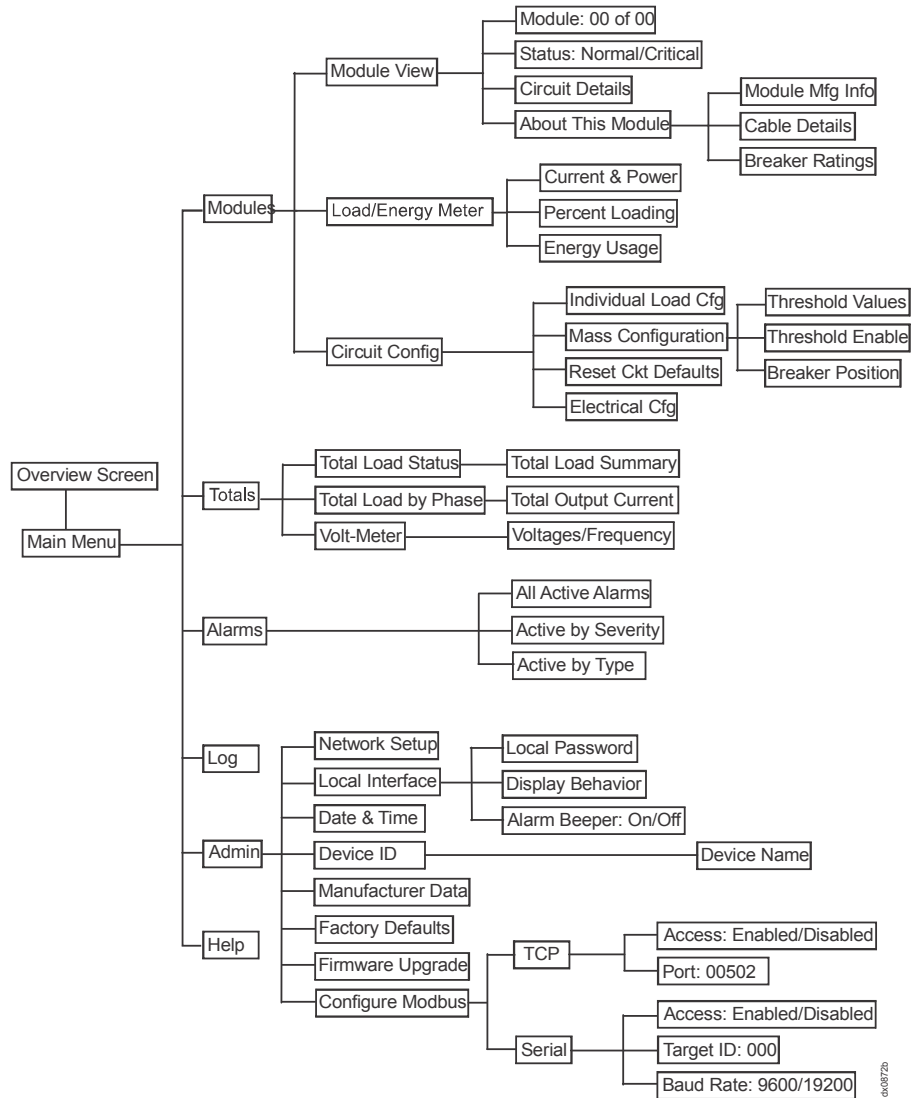
Modules	Admin
Totals	Help
Alarms	
Log	



NOTE: Pressing the UP arrow key when the first item in the main menu is selected will result in the cursor moving to the last item on the screen, and vice versa.

Menu Tree

The menu tree provides a quick overview of the functions and views you can access.

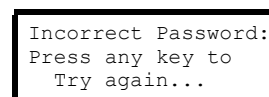
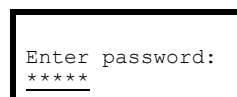


Password Protection

Certain screens can be configured to require a predefined password in order to allow the user access to those screens. Pressing the ENTER key after selecting a protected screen will result in the user being prompted for the password.

Passwords are case sensitive and can be up to eight characters in length. Use the UP or DOWN arrow keys to scroll to different letters in the alphabet. Upper case characters are shown first and then lower case characters. Press the ENTER key to make a character selection. After you make your selection, the cursor will automatically move to the location of the next character. At the end of the string, select the underline (“_”) character and press ENTER.

Your system administrator may configure some screens to be password-protected. The input password will expire after a period of inactivity also configured by the administrator.



Modules Submenu

View Module Status Information

1. From the main menu screen, select **Modules > Module View**.
2. Press ENTER at the **Module** number. Scroll through the module list to the specific module and press ENTER.
3. To view more information about the module, select **Circuit Details** and press ENTER.

```
Module: 00 of 00
Status: Critical
-> Circuit Details
    About This Module
```

4. For 3-cable modules, select the relevant cable and press ENTER.

```
Module 00:      Cable 0:
>Cable 1:      Normal
->Cable 2:      Critical
>Cable 3:      Normal
```

5. Scroll through the three status screens to view power level, amperage, and alarm status of the selected module. Note the warning alarm on **L2** in the example below. An alarm status of **High!**, **Low!**, **Min!**, or **Max!** indicates a reading above or below the threshold level.

```
Module 00,      Cable 0:
Name
Circuit (Name) Critical
Power: 00.0 kW      ↓
```

```
Mod 00, Breakers:      ↑
L1: Closed
L2: Open
L3: Closed      ↓
```

```
Mod 00, Cable 0:      ↑
L1: 0.0A 0.0%
L2: 0.0A 0.0% High!
L3: Closed
```

View Power Distribution Module Information

1. From the main menu screen, select **Modules > Module View** and press ENTER.
2. Press ENTER at the **Module** number. Scroll through the module list to the specific module and press ENTER.
3. Select **About This Module** and press ENTER.

```
Module: 00 of 00
Status: Normal
Circuit Details
→ About This Module
```

4. The selected module is shown in this submenu.

```
Module: 00
Module Mfg Info a
Cable Details b
Breaker Ratings c
```

Select to view either:

a. Module Mfg Info

```
Module 00 Info:
Model: xxxxxxxxxxxx
S/N: xxxxxxxxxxxxxx
Mfg Date: dd/mm/yyyy
```

b. Cable Details

```
Mod 00, Cable: 0 of 0
Length: 0.0ft (0.0m)
Connector: IEC309-3W
Voltage 400V
```

c. Breaker Ratings

```
Mod 00, Cable: 0 of 0
Breaker Ratings:
L1:0.0A L2:0.0A L3:0.0A
```

View Circuit Status Information

The Load/Energy screens are used for status information on a circuit level and the data is grouped by output cable. Scroll through the list to the specific circuit. The circuit names are stated for identification.

1. From the main menu screen, select **Modules > Load/Energy Meter**.
2. Select from the **Circuit Loading** submenu:

```
Circuit Loading
→ Current & Power a
  Percent Loading b
  Energy Usage kWh c
```

a. Current & Power

```
Mod 00 Cable: 0 of 0
  Circuit Name
L1:0A L2:0A L3:0A
Total Power: 0.00kW
```

b. Percent Loading

```
Mod 00, Cable: 0 of 0
L1: 0.0A 0.0%
L2: 0.0A 0.0%
L3: 0.0A 0.0%
```

c. Energy Usage (kWh)

```
Mod 00 Cable: 0 of 0
  Circuit Name
Energy: 0000000.0 kWh
Reset: mm/dd/yyyy
```


Totals Submenu

The **Totals** submenu allows you to view comprehensive information concerning the operational status of the PDU. It also allows you to set and reset alarm thresholds for the entire system.

View Total Load Status

1. From the main menu, select **Totals > Total Load Status**.
2. Status can be **Normal**, **Warning**, or **Critical**. View power factor and load (in kW and kVA).

```
Total Load Summary
Status: Normal
kW: 000.0
kVA: 000.0 PF: 0.00
```

Total Output Current by Phase

1. From the main menu, select **Totals > Total Load by Phase**.
2. View **Total Output Current** and power factor for each phase. **High!**, **Low!**, **Min!**, or **Max!** indicates a reading above or below the threshold level.

```
Total Output Current
L1: 000A 000%
L2: 000A 000% High!
L3: 000A 000%
```

	KVA	kW	PF
L1:	00.0	00.0	0.00
L2:	00.0	00.0	0.00
L3:	00.0	00.0	0.00

View Voltage and Frequency

1. From the main menu, select **Totals > Volt-Meter**.
2. View frequency and voltage by phase.

```
Voltages Freq: 60.0
L1: 0.0 L1-2: 0.0
L2: 0.0 L2-3: 0.0
L3: 0.0 L3-1: 0.0
```

Log Submenu

View or Clear Log Items

- From the main menu, select **Log**.

```

-New Logged Items
Entire Log
Clear Log

```

- Select from the submenu:
 - Select **New Logged Items**. All events logged since your last viewing will display. The most recent item is displayed first.

NOTE: All logged items include a time stamp.

Press the ENTER or UP arrow key to go to the next alarm in sequence. Press the DOWN arrow key to go to the previous alarm in sequence. The No Logged Items screen displays when there are no new logged items.

```

Logged Item: 00 of 00
dd/mm/yy  hh:mm:ss
Alarm Description

```

- Select **Entire Log**. All events logged since the log was last cleared will display.

The most recent item is displayed first. Press the ENTER or UP arrow key to go to the next item in sequence.

Press the DOWN arrow key to go to the previous item in sequence.

The **No Logged Items** screen displays when there are no new logged items.

- Select **Clear Entire Log**.

The following screens are typically password protected. Select **YES, Clear Log** to clear the log, or **NO** to cancel the process. If you press **YES, Clear Log**, the next screen confirms that the log has been cleared. Press any key to continue.

```

Confirm:
Clear Entire Log
Cancel
→ YES, Clear Log

```

```

Log cleared
Press any key to
return to previous menu.

```

Alarms Submenu

View the List of Active Alarms

1. From the main menu, select **Alarms**.

-All Active Alarms Active by Severity Active by Type
--

2. Select from the submenu:

a. Select **All Active Alarms**.

The most recent **Active Alarm** is displayed. Press the ENTER or UP arrow key to go to the next alarm in sequence. Press the DOWN arrow key to go to the previous alarm in sequence. When there are no active alarms, the **No Alarms** screen displays.

```
Active Alarm: 00 of 00
< Description
    of active
    alarm >
```

```
No Active Alarms
System Date/Time:
01-Jan-2012 17:45:00
```

b. Select **Active by Severity**.Select **Warning** or **Critical**.

0 is the number of active alarms of that type. Press ENTER. The most recent **Active Alarm** of the severity you chose is displayed. Press the ENTER or UP arrow key to go to the next alarm in sequence. Press the DOWN arrow key to go to the previous alarm in sequence. If there are no active alarms of the selected severity, the next screen will inform you.

```
View Active Alarms
→ Warning (0)
   Critical (0)
```

```
Active Alarm: 00 of 00
< Description
    of active
    alarm >
```

```
No Active Alarms
of Type Warning.
System Date/Time:
01-Jan-2012 17:45:00
```

c. Select **Active by Type**.Select **Distribution** or **Environment**.

The most recent **Active Alarm** of the type you chose is displayed. Press the ENTER or UP arrow key to go to the next alarm in sequence. Press the DOWN arrow key to go to the previous alarm in sequence. If there are no active alarms of the selected severity, the next screen will inform you.

```
View Active Alarms
→ Distribution (0)
```

```
Active Alarm: 00 of 00
< Description
    of active
    alarm >
```

```
No Active Alarms
of Type Warning.
System Date/Time:
01-Jan-2012 17:45:00
```

Configuration

Configure the Network Address Settings

1. From the main menu, select **Admin > Network Setup**.
2. View network address information. Select **Mode** and press ENTER.

```
Stat: +Up
→ Mode: DHCP & BOOTP
IP: 000.000.000.000
SM: 000.000.000.000
```

```
GW: 000.000.000.000
MAC Address:
[ 00 00 00 00 00 00 ]
```

3. Select the appropriate network configuration type.

```
→Fixed IP Addr a
DHCP Only b
BOOTP Only
DHCP & BOOTP b
```

- a. Select **Fixed IP Address** and press ENTER. Specify the IP, Subnet Mask (SM), and Gateway (GW) addresses. Select **Use Fixed Address** and press ENTER.

```
IP: 000.000.000.000
SM: 000.000.000.000
GW: 000.000.000.000
Use Fixed Address
```

- b. Select **DHCP Only** or **BOOTP Only**. Select **YES, Restart Now** to reboot with new address, or **NO, Revert** to revert to the previous address.

```
Reboot needed for
this change, OK?
NO, Revert
→ YES, Restart Now
```

Set the Name and Location of the Circuits

1. From the main menu screen, select **Modules > Circuit Config > Individual Load Cfg > Name/Location**.
2. Specify the name and location.

```
→M XX Cable: Y
Name: Circuit Name
Location: Circuit Location
```

Enable/Disable Alarm Thresholds for Individual Loads

1. From the main menu screen, select **Modules > Circuit Config > Individual Load Cfg > Module # > Alarm Configuration > Alarm Thresholds**.
2. Select **Alarms** and press ENTER. The input arrow will be activated and you can use the UP or DOWN arrow key to select **Enabled** or **Disabled**. Press ENTER when finished to save the setting.

```
M 00 Cable: 0 of 0
→ Alarms:↑Enabled/Disabled
    Alarm Thresholds
    Reset to Defaults
```

Enable/Disable Module Breaker-Position Alarms

1. From the main menu screen, select **Modules > Circuit Config > Individual Load Cfg > Module # > Alarm Configuration > Alarm Thresholds**.
2. Move the selector arrow to the breaker you want. At the input arrow, use the UP or DOWN arrow key to select **Enabled** or **Disabled** for the selected breaker. Press ENTER to save the setting.

```
M 00, Brkr Alarms:
    L1: Enabled
→   L2:↑Enabled
    L3: Enabled
```

Reset Module Alarm Settings to Default

1. From the main menu screen, select **Modules > Circuit Config > Individual Load Cfg > Module # > Alarm Configuration > Reset to Defaults**.
2. Select the module and cable you want or all modules and press ENTER.

```
What do you want to
reset to defaults
→ Mod: 00 Cable:↑ 00
    All of Module 00
```

3. Select **YES** to reset, or **NO** to abort and press ENTER.

```
Confirm Reset:
Reset Type
NO, ABORT
→ YES, Reset kWh
```

Mass Configuration of Alarms

1. From the main menu screen, select **Modules > Circuit Config > Mass Configuration**.
2. On the submenu, select from the list:

```

Mass Configuration
→ Threshold Values a
  Threshold Enable b
  Breaker Position c
    
```

- a. Select **Threshold Values** and press ENTER. Scroll to the desired **High, Low, Min,** and **Max** settings for alarm thresholds. Select **Apply to All** and press ENTER.

```

Pick Alarm Limits:
→ Min:↓ 00% Hi: 00%
  Low: 00% Max: 00%
  Apply to All
    
```

Select **YES, Apply Settings** to apply settings, or **NO, ABORT** to abort the process. Press ENTER to save your settings.

```

Confirm:
Mass Configure?
  NO, ABORT
→ YES, Apply Settings
    
```

- b. Select **Threshold Enable** and press ENTER. Set **Alarms** to **On, Off,** or ***** (no change). Set **High, Low, Min,** and **Max** threshold alarms to **On, Off,** or ***** (no change). Select **Apply to All** and press ENTER to save your settings.

```

→ Alarms: *
  Min:↓Off Hi: *
  Low: * Max: Off
  Apply to All
    
```

- c. Select **Breaker Position** and press ENTER. Set **Breaker Position Alarms** for **Enabled** or **Disabled**. Select **Apply to All** and press ENTER to save your settings.

```

Breaker Position
→ Alarms:↓ Enabled

  Apply to All
    
```

Change the Password

1. From the main menu, select **Admin > Local Interface > Local Password**.
2. Specify the new **Password** by scrolling through alphabet characters using the UP or DOWN arrow keys. Press ENTER. You can also change the **Timeout** period. Scroll to your numerical selection and press ENTER.

```

Password:  *****
Timeout:  XX min.
Invalidate NOW

```

An Administrator User can cause a password timeout to expire using the **Invalidate NOW** feature. This is useful if another user has logged in and neglected to log out since only one user at a time may be logged in.

NOTE: Characters are presented in the following sequence: `_`, (space), A, B, C, D, E, etc. Press the ENTER key to select the displayed character and proceed to the next character. Passwords can be up to eight characters in length. If your password is less than eight characters, end with the underline ("`_`") character.

Change Display Interface Settings

1. From the main menu, select **Admin > Local Interface > Display Behavior**.
2. Select the setting you want to change and press ENTER.

```

-Contrast: ↑ 0 a
Key Click: ↑ On b
Beeper Volume: ↑ Med c
Check Log Light d ↓

```

- a. **Contrast** can be set between **1** (low) and **7** (high).
- b. **Key Click** can be set to **On** or **Off**.
- c. **Beeper Volume** can be **Low**, **Med**, **High**, or **Off**.
- d. The **Check Log Light** option allows you to change the types of logged items that cause the Check Log LED to illuminate. Select **Check Log Light** and press ENTER. Scroll to choose **Info** (informational), **Warning**, **Critical**, or **Disabled** and press ENTER. Your selection represents the minimal type of event monitored by the **Check Log Light**.

Change the Date and Time on the Display Interface

1. From the main menu, select **Admin > Date/Time**.
2. Select the setting you want to change and press ENTER.

```
Mode: Manual
→Format: dd/mm/yyyy a
Date: 21/01/2012 b
Time: 12:00:00 c
```

- a. **Format:** You can change how the date is presented by scrolling through the **Format** options.
- b. **Date:** Scroll through the screen that opens to set the new **Month, Day, and Year**. Select **Apply New Date** and press ENTER to save your changes.

```
→Month: January
Day: 21
Year: 2012
Apply New Date
```

- c. **Time:** Scroll through the screen that opens to set the new **Time**. Select **Apply New Time** and press ENTER to save your changes.

```
→Time: 12:00:00
Apply New Time
```

Modbus Configuration

Modbus Serial Configuration

1. From the main menu, select **Admin > Configure Modbus > Serial**.
2. Choose your selection and press ENTER to set or change:

```
Access: Disabled
Target ID: 001
Baud Rate: 9600
```

- a. **Access:** Enable or disable Modbus.
- b. **Target ID:** Each Modbus device must have a unique target identification number. Enter a unique number, ranging from 1 to 247, for this unit.
- c. **Baud Rate:** Choose either 9600 bps or 19200 bps.

NOTE: An RS232 to RS485 converter (not provided) must be used to connect to a building management system.

To communicate RS-232 to the RPP/RDP through the console port, the RS232 to RS485 converter must be configured as a DTE device with Send Data Control rather than RTS control (most converters are DCE - some can be ordered as DTE). Some devices like the Omega Model 285 Superverter support DCE/DTE selection with a switch. Other devices such as those produced by B&B Electronics require a zero ohm resistor re-position to configure as a DCE device - see the device data sheet for details. RTS or SD selection is generally accomplished with a jumper. An appropriate RS-232 cable like the APC 940-0024D is also required.

The console port can be configured to run at either 9600 or 19200 baud. This must match the Building Management System or Modbus network transfer rate.

Most serial converters are capable of either 4-wire or 2-wire modbus connections. The unit is designed to handle 2-wire, half-duplex communication. For a 2-wire, half-duplex connection, jumper connectors should be placed between R+ & T+, and R- & T-. Then the modbus + wire is connected to R+/T+ and the - wire is connected to R-/T-. Some converters like the B&B Electronics 4850T9L offer dip switches to accomplish the jumper connections.

NOTE: All RS232 to RS485 converters tested relied on a power supply that plugs into 110V AC wall receptacle.

NOTE: There is a known modbus polarity labeling ambiguity between converters, so if the modbus communication isn't successful, try reversing the 2-wire connection.

Modbus TCP Configuration

1. From the main menu, select **Admin > Configure Modbus > TCP**.
2. Choose your selection and press ENTER to set or change:

```
Status: Disabled
Port: 502
```

- a. **Status:** Enable or disable Modbus TCP to view the device through your building management service's interface.
 - b. **Port:** Each Modbus TCP must have a unique target TCP port number. Enter a unique number, ranging from 502, 5000 to 32768.
3. Press ENTER. The display interfaces will navigate to the reboot page to save your settings.

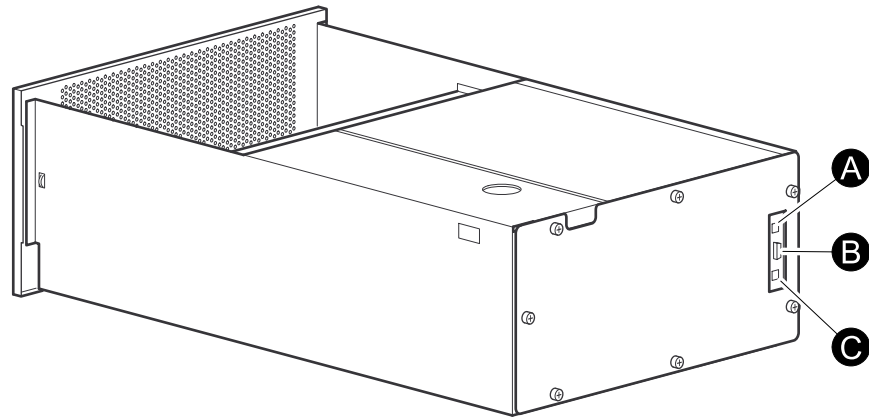
```
Reboot needed for
this change. OK?
NO, Revert,
YES, Reboot Now
```

Network Management Configuration

Overview

NOTE: For complete Network Management Card setup instructions, see the online User Guide at www.apc.com.

Connections



Make the connection to the PDU: A Cat-5 cable is plugged into the bottom RJ-45 connector (C) on the rear of the unit. Connect the other end of the Cat-5 cable to a local computer or a network hub.

NOTE: Do not use the top RJ-45 connector (A) above the serial port (B).

A serial cable can be connected to the serial port (B). Connect the other end to a local computer.

Initial Setup

You must configure the following three TCP/IP settings before the PDU can operate on a network:

- IP address of the PDU
- Subnet mask
- Default gateway

If a default gateway is unavailable, use the IP address of a computer (that is usually running) located on the same subnet as the NMC. The NMC uses the default gateway to test the network when traffic is light.

NOTE: Do not use the loopback address as the default gateway address for the Network Management Card. You will lose communication with the equipment. Doing so will disable the card and require you to reset TCP/IP settings to their defaults using a local serial login.

TCP/IP Configuration Methods

Use one of the following methods to define the basic TCP/IP settings needed by the Network Management Card.

- Device IP Configuration Wizard
- BOOTP or DHCP server
- Networked computer
- Display interface

Device IP Configuration Wizard

The Wizard runs on Microsoft Windows 2000, Windows 2003, and Windows XP operating systems. The Device IP Configuration Wizard configures the IP address, subnet mask, and default gateway of one or more NMCs.

You can use the Wizard in either of the following ways:

- Remotely over your TCP/IP network to discover and configure unconfigured NMCs on the same network segment as the computer running the Wizard.
- Through a direct connection from a serial port of your computer to the PDU to configure or reconfigure it.

Installation

Install the Wizard from a downloaded executable file:

1. Go to www.apc.com.
2. Download the Device IP Configuration Wizard.
3. Run the executable file in the folder in which it was downloaded.

Launch the Wizard

The installation creates a shortcut link in the Start menu to launch the Wizard. Most software firewalls must be temporarily disabled for the Wizard to discover unconfigured NMCs.

Supported Web Browsers

Use Microsoft® Internet Explorer (IE) 7.x and higher (Windows operating systems) or Mozilla Firefox 3.0.6 or higher (all operating systems) to access the NMC through its Web interface. Other commonly available browsers may work but have not been fully tested by Schneider Electric. The NMC cannot work with a proxy server. Before using a Web browser to access its Web interface, do one of the following:

- Configure the Web browser to disable the use of a proxy server for the NMC.
- Configure the proxy server so that it does not proxy the specific IP address of the NMC.

Network Management Features

These applications and utilities work with a Modular PDU that connects to the network through its Network Management Card:

- StruxureWare —Provide enterprise-level power management and management of Schneider Electric agents, Modular PDUs, information controllers, and environmental monitors
- PowerNet® Management Information Base (MIB) with a standard MIB browser—Perform SNMP SETs and GETs and to use SNMP traps
- APC Device IP Configuration Wizard—Configure the basic settings of one or more NMCs over the network
- APC Security Wizard—Create the components needed for high security for the NMC when using Secure Sockets Layer (SSL) and related protocols and encryption routines

Log On

Use the DNS name or System IP address of the NMC for the URL address of the Web interface. The default user name differs by account type:

- **apc** for a Super User
- **device** for a Device user
- **readonly** for a Read-Only user

If you are using HTTPS (SSL/TSL) as your access protocol, your logon credentials are compared with information in a server certificate. If the certificate was created with the APC Security Wizard, and an IP address was specified as the common name in the certificate, you must use an IP address to log on to the NMC. If a DNS name was specified as the common name on the certificate, you must use a DNS name to log on.

URL Address Formats

Type the DNS name or IP address of the NMC in the URL address field of the Web browser and press ENTER. When you specify a non-default Web server port in Internet Explorer, you must include **http://** or **https://** in the URL.

Common Browser Error Messages at Log-on.

Error Message	Browser	Cause of the Error
"This page cannot be displayed."	Internet Explorer	Web access is disabled, or the URL was not correct.
"Unable to connect."	Firefox	

Security

Access Priority for Logging On

Only one user at a time can log on to the Modular PDU.

- Local access from a computer with a direct serial connection to the Modular PDU.
- Telnet or Secure Shell (SSH) access to the control console from a remote computer.
- Web access, either directly or through StruxureWare Central.

User Accounts

The three levels of access are protected by user name and password requirements. During authentication, the user's credentials are compared against the Local User Database and/or are validated against a RADIUS server (depending on configuration). If valid, access with appropriate permissions is granted.

- An Administrator can use all the menus in the Web interface. The default user name for the Administrator User is **apc**.
- A Device User can access only the menus on the Home, Power Distribution, and Logs tabs in the Web interface. The default user name for the Device User is **device**.
- A Read-Only User has only Web interface access. The same menus as Device User are visible but no changes can be made. Links to configuration options are visible but disabled. Event and data logs display no button to clear the log. The default user name is **readonly**.

Watchdog Features

Watchdog mechanisms detect internal problems. After a restart, a System: Warmstart event is recorded in the event log.

Network Interface Watchdog Mechanism

Watchdog mechanisms protect the NMC from becoming inaccessible over the network. If it does not receive any network traffic for 9.5 minutes, it assumes there is a problem with its interface and restarts.

Resetting the Network Timer

To ensure the NMC does not restart if the network is quiet for 9.5 minutes, it attempts to contact the default gateway every 4.5 minutes. The gateway response resets the 9.5-minute timer. If your application does not require or have a gateway, specify the IP address of a computer that is running on the network most of the time and is on the same subnet. The network traffic of that computer will restart the 9.5-minute timer frequently enough to prevent the NMC from restarting.

Recover from a Lost Password

1. At the local computer, select a serial port, and disable any service that uses it.
2. Connect the provided serial cable to the computer and the port on the PDU.
3. Run a terminal program (such as HyperTerminal®) and configure the port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
4. Press ENTER, repeatedly if necessary, to display the **User Name** prompt. If you are unable to display the **User Name** prompt, verify the following:
 - The serial port is not in use by another application.
 - The terminal settings are correct as specified in step 3.
 - The correct cable is being used.
5. Press the reset button on the back of the unit. The status LED will flash. Press the reset button a second time while the status LED is flashing to temporarily reset both the user name and password to **apc**.
6. Press ENTER as many times as necessary until the **User Name** prompt displays, then use the temporary user name and password **apc**. (If you take longer than 30 seconds to log on after the **User Name** prompt is displayed, you must repeat step 5 and log on again.)

7. At the command line interface, use the following commands to change the **Password** setting, which is now temporarily **apc**:

```
user -n <user name> -pw <user password>
```

For example to change the a password to XYZ, type:

```
user -n apc -pw XYZ
```

The super user's password must be specified when making any changes to the user account. For more information, see the "user" section in the NMC CLI Guide.

NOTE: For security reasons, it is possible to disable the super user account. To verify that the super user account is enabled, type:

```
user -n <user name>
```

If *Access: Disabled* is returned, the super user account can be re-enabled by typing:

```
user -n <user name> -e enable
```

8. Type **quit** or **exit** to log off, reconnect any serial cable you disconnected, and restart any service you disabled.

Maintenance

Parts Replacement

Determine if you Need a Replacement Part

To determine if you need a replacement part, contact Schneider Electric Customer Support and follow the procedure below so that a representative can assist you promptly:

1. The display interface may show additional screens if module replacement is necessary. Press any key to scroll through these lists, record the information, and provide it to the representative.
2. Write down the serial number of the unit so that you will have it easily accessible when you contact Customer Support.
3. If possible, call Customer Support from a telephone that is within reach of the unit so that you can gather and report additional information to the representative.
4. Be prepared to provide a detailed description of the problem. A representative will attempt to help you over the telephone, if possible, or will assign a Return Material Authorization (RMA) number to you. If a module is returned, this RMA number must be clearly printed on the outside of the package.
5. If the unit is within the warranty period, repairs or replacements will be performed free of charge. If it is not within the warranty period, there will be a charge.
6. If the unit is covered by a service contract, have the contract available to provide information to the representative.

Return Parts

Contact Customer Support to obtain an Returned Materials Authorization (RMA) number.

To return a module, pack the module in the original shipping materials, and return it by insured, prepaid carrier. The Customer Support representative will provide the destination address. If you no longer have the original shipping materials, ask the representative about obtaining a new set. Pack the module properly to avoid damage in transit. Never use Styrofoam beads or other loose packaging materials when shipping a module, as the module may settle in transit and become damaged. Enclose a letter in the package with your name, RMA number, address, a copy of the sales receipt, description of the problem, a phone number, and a check as payment (if necessary).

NOTE: Damages sustained in transit are not covered under warranty.

Power Distribution Modules

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

To remove a Power Distribution Module:

- Turn off all power supplying the equipment and perform appropriate lockout/tagout procedures before installing or removing the Power Distribution Module, OR
- If a Symmetra PX UPS is providing power to the Modular PDU, place the UPS into battery operation (to reduce fault current) before removing the Power Distribution Module. To place the UPS into battery operation, see the UPS Operation Manual.

Failure to follow these instructions will result in death or serious injury.

NOTICE

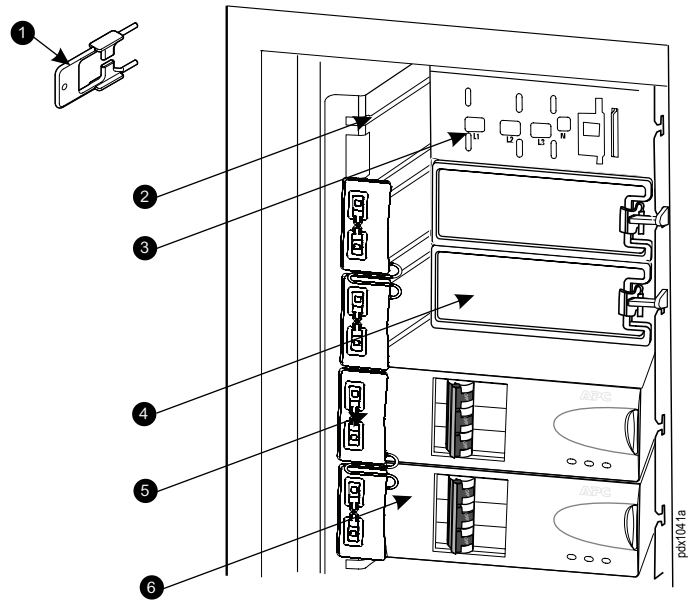
- Install only Schneider Electric PDMs with matching output voltage.
- Install PDMs starting from the bottom of the panel to avoid cable congestion.
- Save filler plates for future re-use. If a module is removed, a filler plate must be installed to cover the open space.

Failure to follow these instructions can result in equipment damage.

Factory installed filler plates and slot locks cover each module position.

Before putting the unit into service, the backplane of each module position must be covered with a filler plate or a Power Distribution Module (PDM). All positions must be secured with a slot lock.

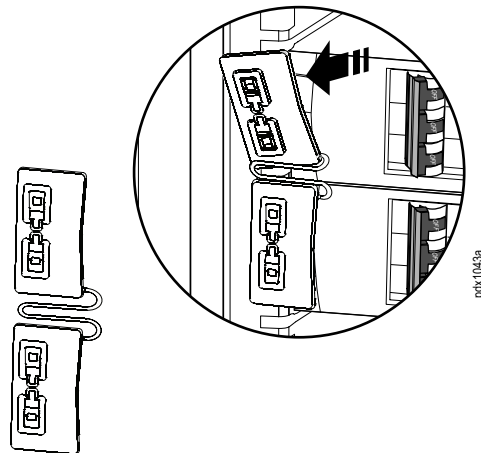
Component Identification



Item	Description
1	Slot lock key
2	Slots (hold modules in place)
3	Bus bar
4	Filler plate
5	Module slot lock
6	Power distribution module

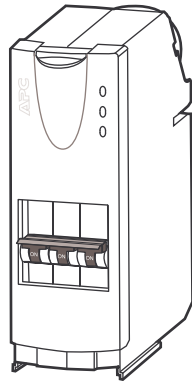
NOTE: Two slot locks are attached together as a pair.

The illustration shows the top lock removed from its slot but still attached to the installed lock below it.

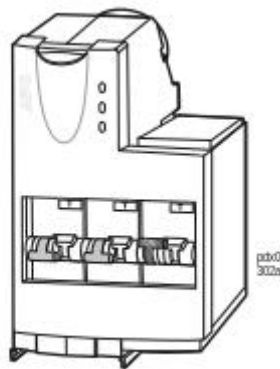


Module Types

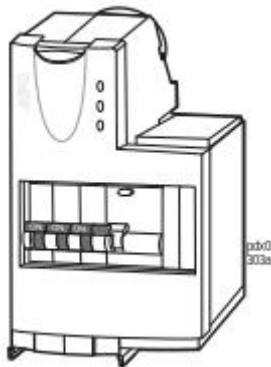
PDM – Single and Three Phase



PDM with RCD (Residual Current Devices) – Single Phase

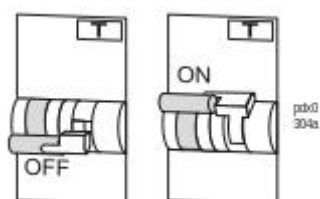


PDM with RCD (Residual Current Devices) - Three Phase



PDMs with RCDs

PDMs with RCDs



A ground fault will open the adjacent breaker to the OFF position. The ground fault is indicated by a red strip on the RCD toggle.

Test the Residual Current Device

NOTE: Pushing the test button will open circuit breakers, distributing power to the equipment.

1. Press the test button and confirm that the Residual Current Device (RCD) and adjacent circuit breaker trip to the OFF position.
2. Reset the RCD and circuit breaker to normal by pushing the toggle to the ON position.

Install a Power Distribution Module

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

To remove a Power Distribution Module:

- Turn off all power supplying the equipment and perform appropriate lockout/tagout procedures before installing or removing the Power Distribution Module, OR
- If a Symmetra PX UPS is providing power to the Modular PDU, place the UPS into battery operation (to reduce fault current) before removing the Power Distribution Module. To place the UPS into battery operation, see the UPS Operation Manual.

Failure to follow these instructions will result in death or serious injury.

1. Open the front door of the PDU.

⚡ ⚠ DANGER

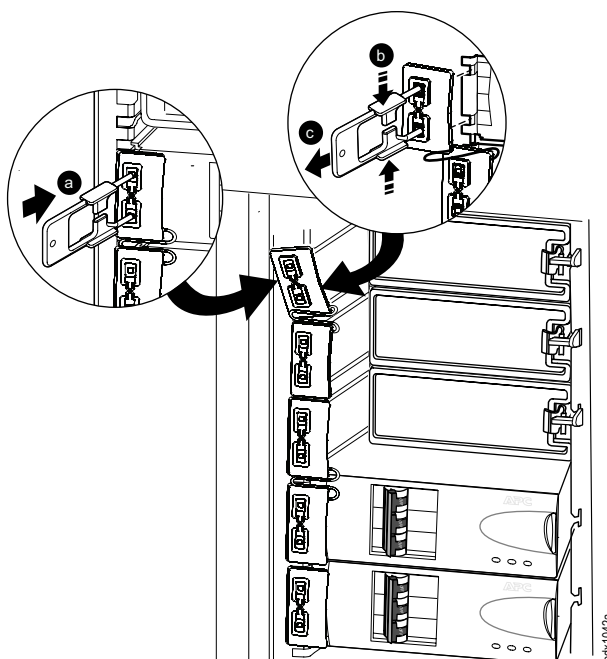
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.

Failure to follow these instructions will result in death or serious injury.

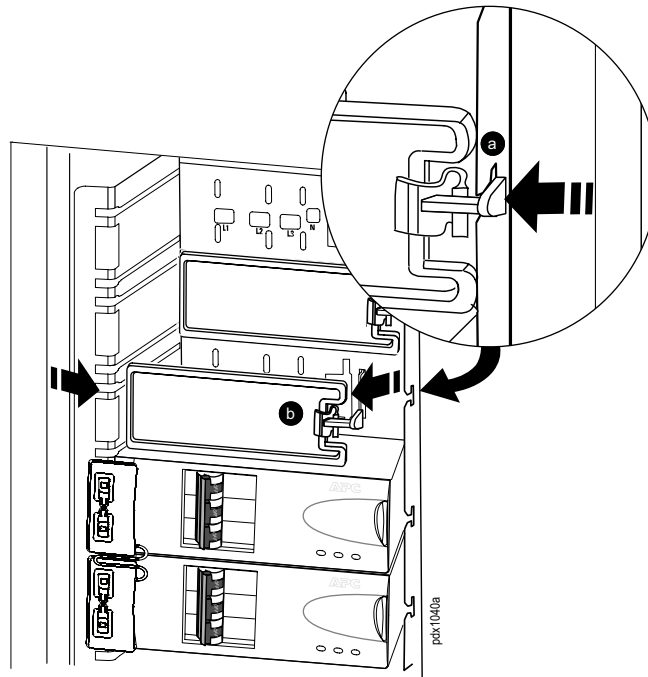
2. Remove the slot lock.

Use the key (provided) to remove the slot lock.



- a. Insert the key in the slot lock as shown in the illustration.
- b. Squeeze the sides of the key inward to grasp the slot lock firmly.
- c. Pull the slot lock key out, while squeezing, to extract the lock from the slot.

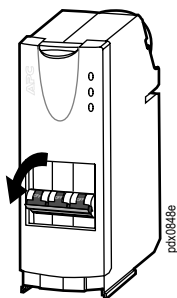
3. Remove the filler plates.



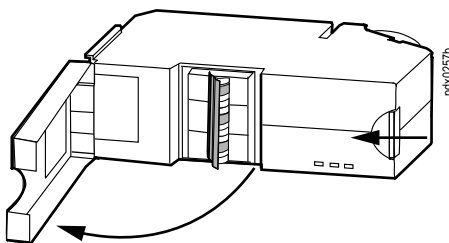
- a. Press down on the filler plate clip to release its locking mechanism.
- b. Pull the filler plate directly towards you and along the slot until it is free.

4. Install a module.

- a. Make sure all breakers on the PDM being installed are in the OFF (open) position.

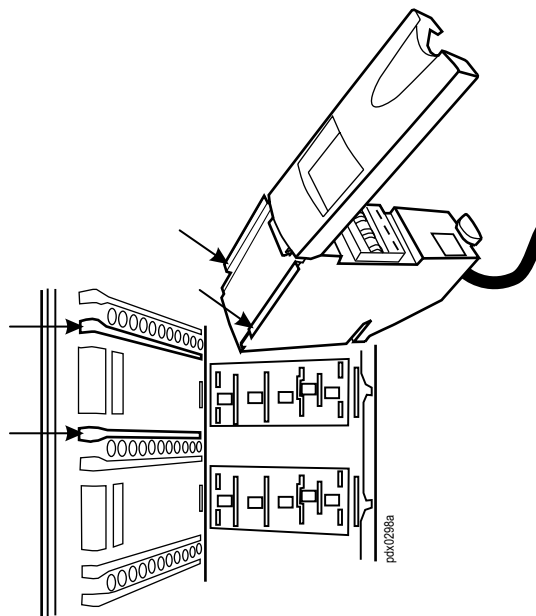


- b. Press the red button to release the latch on the PDM.

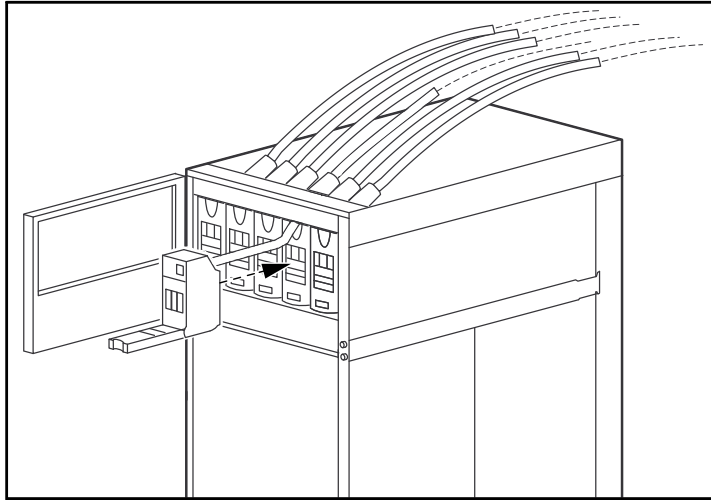


- c. Pull open the latch.
- d. Slide the PDM into the panel using the top and bottom guide tracks (slots) for that position. Make sure you slide the PDM all the way into position.

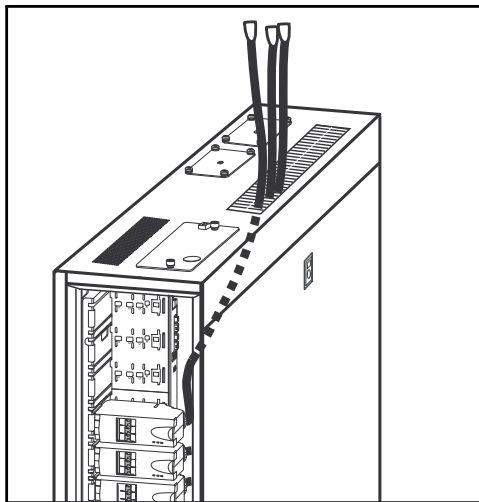
Close the latch to tighten the electrical contacts in the PDM against the bus bar.



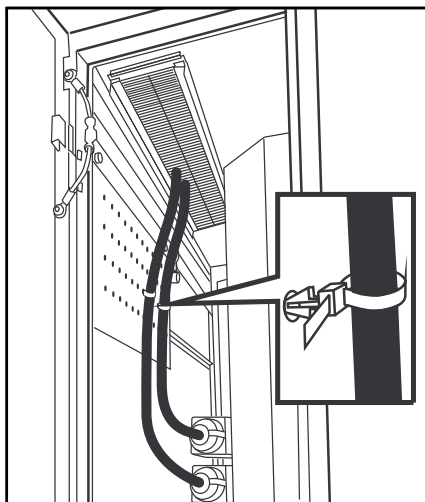
- e. Feed cable from the PDM through the slot in the roof.



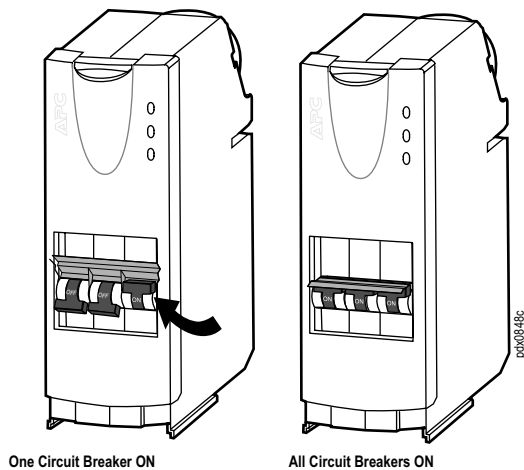
- f. Vertical Rack Distribution Panel Only: Leave a minimum of 7 inches (178 mm) of slack in the cable behind the module. The slack is useful in case the module is ever removed or replaced. 10 to 20 inches (254 to 508 mm) is recommended but space restrictions in the PDU and cable diameter size will cause the amount of slack to necessarily vary.



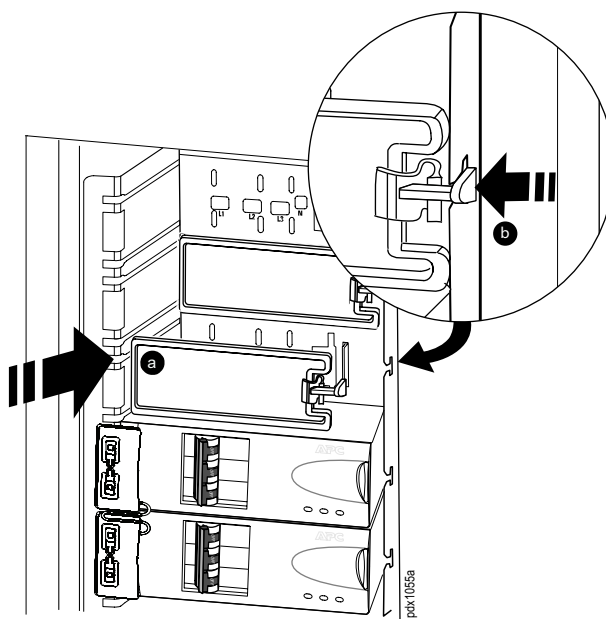
- g. When installing PDMs near the top of the panel, feed the cable first, pulling up the slack, and then secure the module to the slot to avoid cable congestion between the panel and the slot.
- h. Use plastic ties to secure loose cable(s) to the enclosure.



- i. Set the required breakers on the newly installed PDM to the ON (closed) position.



5. Install the filler plates to properly cover 3-pole panel positions that are not occupied by a PDM.

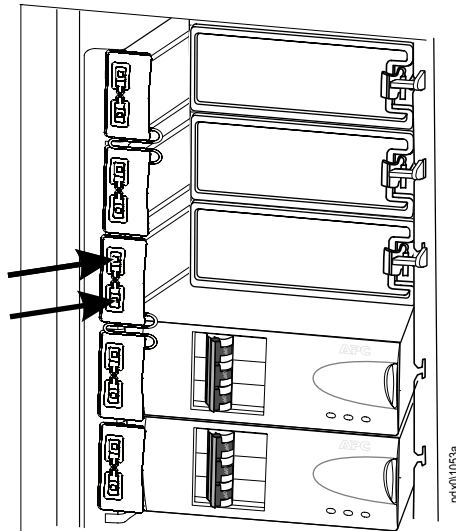


- a. Position the filler plate in front of an open PDM location and insert the bottom tab of the filler plate into the slot. Slide the filler plate towards the bus bar.
- b. Snap the filler plate into position. Check that the latch is secure.

6. Install a slot lock.

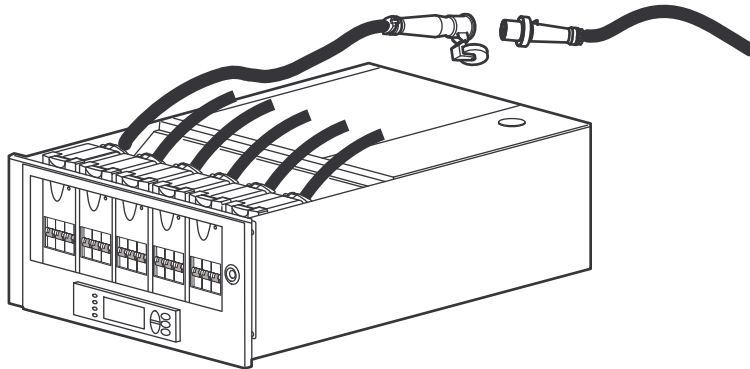
NOTE: A slot lock must be installed in each module space whether filled by a module or filler plate.

Press the slot lock into the slots as shown in the illustration.



NOTE: Upon completion of PDM installation, close the door to the PDU.

7. Connect the PDM cable to the appropriate Rack PDU or other equipment.



NOTE: Power can be restored to the PDU following connection of the PDM cables to the load.

Remove a Power Distribution Module

DANGER

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DANGER

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- Turn off all power supplying the equipment and perform appropriate lockout/tagout procedures before installing or removing the Power Distribution Module, OR
- If a Symmetra PX UPS is providing power to the Modular PDU, place the UPS into battery operation (to reduce fault current) before removing the Power Distribution Module. To place the UPS into battery operation, see the UPS Operation Manual.

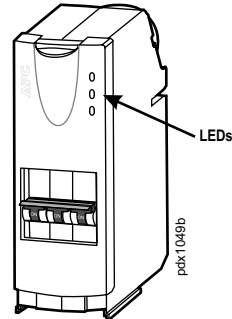
Failure to follow these instructions will result in death or serious injury.

Reverse the module installation procedure to remove a PDM.

Troubleshooting

LEDs on Power Distribution Modules

There are three LEDs on each power distribution module. The LEDs indicate the following conditions:



- Red: Critical alarm
- Yellow: Warning alarm
- Green: No alarm
- Flashing green: The module is being identified by the system. The flashing should only last a few seconds. It will stop once the module has been identified.

Status and Alarm Messages

The PDU may display any of the following status and alarm messages. The messages are listed in alphabetical order, along with recommended corrective actions to help you troubleshoot problems.

Display Message	Meaning	Corrective Action
High Module Current	The module current exceeded the high threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
High Subfeed Current	The subfeed current exceeded the high threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
High Total Output Current	The total output current exceeded the high threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
High Output Voltage	The output voltage exceeded the high threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Low Module Current	The module current dropped below the low threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Low Subfeed Current	The subfeed current dropped below the low threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Low Total Output Current	The total output current dropped below the low threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Low Output Voltage	The output voltage dropped below the low threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Maximum Module Current	The module current exceeded the maximum threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.

Display Message	Meaning	Corrective Action
Maximum Subfeed Current	The subfeed current exceeded the maximum threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Max Total Output Current	The total output current exceeded the maximum threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Max Output Voltage	The output voltage exceeded the maximum threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Minimum Module Current	The module current dropped below the minimum threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Minimum Subfeed Current	The subfeed current dropped below the minimum threshold.	Evaluate the threshold setting. If necessary, adjust it to properly accommodate your situation.
Modular Distribution Communication.	Communication has been lost with the modular distribution breakers.	Check the communication cables to ensure they are properly connected. Contact Customer Support.
Module Breaker Open.	A modular circuit breaker is open.	Check the modular circuit breakers to see if one has overloaded. Replace if necessary.
Output Frequency.	The output frequency is exceeding the frequency deviation threshold.	Evaluate the threshold setting and the power quality. Adjust the threshold setting to accommodate your situation. Note: Some backup generators do not tightly regulate their output during normal operation and can trigger this alarm.
Subfeed Breaker Open.	A subfeed circuit breaker is open.	Check the subfeed circuit.

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* 9 9 0 - 3 0 5 4 F - 0 0 1 *

As standards, specifications, and design change from time to time,
please ask for confirmation of the information given in this publication.

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