

Oracle® Rack Cabinet 1242 Power Distribution Units User's Guide

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Using This Documentation

- **Overview** – Provides specifications and describes how to install, administer, and service the power distribution units designed for the Oracle Rack II family of rack cabinets.
- **Audience** – Technicians, system administrators, and authorized service providers.
- **Required knowledge** – Professional installers, authorized service providers (ASPs), and users who have been instructed on the hazards within the equipment and have experience installing and cabling equipment into rack cabinets.

Product Documentation Library

Documentation and resources for this product and related products are available at <http://www.oracle.com/goto/oraclerack1242/docs>.

Feedback

Provide feedback about this documentation at <http://www.oracle.com/goto/docfeedback>.

Understanding PDUs

These topics describe various PDUs and the tasks required to install them.

- [“Task Installation Overview” on page 13](#)
- [“PDU Overview” on page 13](#)

Task Installation Overview

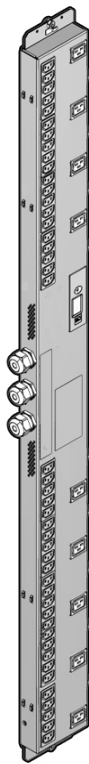
Step	Description	Links
1.	Familiarize yourself with the PDU.	“PDU Overview” on page 13
2.	Review the PDU site requirements and specifications.	“Confirming Facility Requirements and PDU Specifications” on page 17
3.	Take safety and ESD precautions and gather the required tools.	“Safety Notices” on page 25 “Tools” on page 27
4.	Install a PDU into the rack.	“Prepare to Install a PDU” on page 31
5.	Connect the PDU to the AC power source.	“Connect the PDU to the AC Power Source” on page 38
6.	Reset circuit breakers.	“Circuit Breaker Locations” on page 38
7.	Connect equipment power cords to PDU.	“Connect Equipment Power Cords to PDUs” on page 39
8.	Power on the equipment.	“Power on the Equipment” on page 40

PDU Overview

This document provides instructions for both original PDUs and enhanced PDUs. You can install up to two PDUs in one Oracle Rack 1242 cabinet.

- The original PDU metering unit allows you two ways to monitor the current being used by equipment connected to a PDU. You can monitor the current in person by viewing the LCD screen on the PDU itself or the Current Measurement page using HTML interface.
- For enhanced PDUs, there are four ways you can monitor how much power, energy and current the equipment attached to the PDU uses, as well as the voltage level powering the equipment, the PDU's LCD screen, the Monitoring Overview page using HTML interface, the RS-232 interface, or the SSH interface.

FIGURE 1 PDU



There are two types of PDUs, based on geography.

TABLE 1 PDUs Types

PDU	Phase Type	Geography
Original PDU/	Low-voltage, single-phase	N & S America, Japan, & Taiwan

PDU	Phase Type	Geography
Enhanced PDU	Low-voltage, three-phase	N & S America, Japan, & Taiwan
	High-voltage, single-phase	EMEA & APAC
	High-voltage, three-phase	EMEA & APAC

Confirming Facility Requirements and PDU Specifications

These PDUs are designed exclusively for the Oracle Rack Cabinet family of rack cabinets. Before installing PDUs, review the facility requirements and PDU specifications.

Note - The three-phase PDUs (both the high-voltage and low-voltage versions) are not supported in the Oracle Rack 1042. If your equipment requires a three-phase PDU, use the Oracle Rack 1242 instead.

- [“Confirming Facility Requirements” on page 17](#)
- [“Confirming PDU Specifications” on page 19](#)

Confirming Facility Requirements

Review the power, circuit breaker, and grounding requirements of your facility, and review all safety notices, prior to installing and cabling the PDU.

- [“Facility Power Requirements” on page 17](#)
- [“Circuit Breaker Capacity and Characteristics” on page 18](#)
- [“Grounding Requirements” on page 19](#)

Facility Power Requirements

To prevent catastrophic failures, design your input power sources to ensure that adequate power is provided to the PDUs. Use dedicated AC breaker panels for all power circuits that supply power to the PDU.

Oracle PDUs are designed to measure the incoming line to neutral voltage. There are many power system types which, when connected to the PDU, will ensure that the PDU outlet groups provide the required output voltage. However, the PDUs cannot accurately measure the voltage

when connected to certain power system types. Oracle PDUs measure the correct voltage when connected to a wye TN power system. Using any other power system type might lead to incorrect voltage measurements.

Oracle PDUs are designed to be used with TN, TT or IT power systems. However, TN systems are recommended for accurate measuring of environmental variables. For TN power systems, the PDUs must be provided with protective earthing (grounding) from the installation facility through the earth conductor of the PDU power cord. Additional earthing (grounding) is recommended to ensure continued safe operation of your racked product. Refer to [“Attaching a Grounding Cable”](#) in *Oracle Rack Cabinet 1242 User’s Guide* for instructions.

Note - For TT power systems, the power source has no earth connection and so the earth connection *must* be made through the rack. Refer to [“Attaching a Grounding Cable”](#) in *Oracle Rack Cabinet 1242 User’s Guide* for instructions.

Note - All Oracle PDUs are suitable for connection to TN and TT power systems. All PDUs with a maximum of a 240V phase-to-phase rating, fuses in each line, and neutral conductors are suitable for IT power systems that supply a maximum of 240V phase-to-phase. If you are installing an Oracle Engineered System, refer to its documentation to determine if the system is suitable for connection to IT power systems.

While the PDU power cords are 4m (13.12 ft.) long, 1 to 1.5m (3.3 to 4.9 ft.) of the cords will be routed within the rack cabinet. The installation site's AC power receptacle must be within 2m (6.6 ft.) of the rack.

Electrical work and installations must comply with applicable local, state, or national electrical codes. Contact your facilities manager or a qualified electrician to determine what type of power is supplied to your building.

When planning for power distribution requirements for installed rack equipment:

- Balance the power load between available AC supply branch circuits.
- In the United States and Canada, ensure that the overall system AC input current load does not exceed 80% of the branch circuit AC current rating.

Circuit Breaker Capacity and Characteristics

Each Oracle Rack 1242 requires its own customer-supplied circuit breaker and AC receptacle for each power input cord. Provide a stable power source, such as an uninterruptible power system (UPS), to reduce the possibility of component failures. If the computer equipment is subjected to repeated power interruptions and fluctuations, it is susceptible to a higher component failure rate than it would be with a stable power source.

Grounding Requirements

For TN power systems, always connect the PDU input power cords into grounded power outlets. For TT power systems, always attach a grounding cable to the rack frame. Refer to [“Attaching a Grounding Cable” in Oracle Rack Cabinet 1242 User’s Guide](#) for further information.



Caution - To reduce the risk of electric shock or damage to installed equipment, never disable the grounding plug on any power cord or receptacle.

Confirming PDU Specifications

These topics describe the PDU specifications.

Description	Links
Review specifications for PDUs.	“PDU Overview” on page 13 “PDU Physical Specifications” on page 19 “PDU Electrical Specifications” on page 20 “PDU Input Leads and Outlet Groups on Single-Phase PDUs” on page 22 “PDU Input Leads and Outlet Groups on Three-Phase PDUs” on page 23 “Environmental Specifications” on page 23

PDU Physical Specifications

TABLE 2 PDU Physical Specifications

Dimension	Measurement
Length	1674 mm / 65.91 in.
Depth	47 mm / 1.85 in.
Width	134 mm / 5.28 in.
Power input lead cord nominal length	4 m / 13.12 ft.

Dimension	Measurement
Weight (including cords)	
Low-voltage PDUs for North and South America, Japan, and Taiwan:	
■ 5 kVA, single phase	13.25 kg / 29.21 lbs
■ 10 kVA, single phase	15.00 kg / 33.07 lbs
■ 15 kVA, single phase	16.75 kg / 36.93 lbs
■ 15 kVA, three phase	13.60 kg / 29.98 lbs
■ 24 kVA, three phase	15.70 kg / 34.61 lbs
■ 37 kVA, three phase	17.80 kg / 39.24 lbs
High-voltage PDUs for EMEA and APAC:	
■ 5 kVA, single phase	13.10 kg / 28.88 lbs
■ 10 kVA, single phase	14.70 kg / 32.41 lbs
■ 15 kVA, single phase	16.30 kg / 35.94 lbs
■ 15 kVA, three phase	16.10 kg / 35.49 lbs
■ 22 kVA, single phase	16.30 kg / 35.94 lbs
■ 24 kVA, three phase	20.60 kg / 45.42 lbs
■ 37 kVA, three phase	25.15 kg / 55.45 lbs

Note - 1 to 1.5 m (3.3 to 4.9 ft.) of the cords will be routed within the rack cabinet, so the site's AC power receptacle must be within 2m (6.6 ft.) of the rack.

PDU Electrical Specifications

The following tables describe the PDU electrical specifications, including the number and type of connectors and receptacles.

TABLE 3 Specifications for North and South America, Japan, and Taiwan Low-Voltage Single Phase PDUs

Specification	10KVA	15KVA	22KVA
Number of Inputs	2	3	3
Source Voltage	200-240V	200-240V	200-240V
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Max Line Current	24A	24A	36.8
Phase Current	N/A	N/A	N/A
Nominal Power Rating	10KVA	15KVA	22KVA
Recommended Circuit Breaker	30A	30A	50A

Specification	10KVA	15KVA	22KVA
Outlets	42 x C13 6 x C19	42 x C13 6 x C19	42 x C13 6 x C19
Outlet Groups	6	6	6
Max Group Current	20A	20A	20A
Output Voltage	200-240V	200-240V	200-240V
Data Centre Receptacle	1ph 2W + ground 30A NEMA L6-30	1ph 2W + ground 30A NEMA L6-30	1ph 2W + ground 30A NEMA L6-30

TABLE 4 Specifications for North and South America, Japan, and Taiwan Low-Voltage Three Phase PDUs

Specification	8.6KVA	15KVA	24KVA	26KVA	37KVA
Number of Inputs	1	1	2	3	3
Source Voltage	200-220V	200-220V	200-220V	200-220V	200-220V
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Max Line Current	24A	40A	34.6A	24A	34.6A
Phase Current	13.85A	23A	20A	13.85A	20A
Nominal Power Rating	8.6KVA	15KVA	24KVA	26KVA	37KVA
Recommended Circuit Breaker	30A	50A	50A	30A	50A
Outlets	42 x C13 6 x C19	42 x C13 6 x C19	42 x C13 6 x C19	42 x C13 6 x C19	42 x C13 6 x C19
Outlet Groups	6	6	6	6	9
Max Group Current	14A	20A	20A	14A	20A
Output Voltage	200-240V	200-240V	200-240V	200-240V	200-240V
Data Centre Receptacle	3ph 3W + ground 30A IEC60309 NEMA L21-30P	3ph 3W + ground 60A IEC60309	3ph 3W + ground 60A IEC60309	3ph 3W + ground 30A IEC60309 NEMA L21-30P	3ph 3W + ground 60A IEC60309

TABLE 5 Specifications for EMEA and APAC High-Voltage Single Phase PDUs

Specification	10KVA	22KVA
Number of Inputs	2	3
Source Voltage	200-240V	200-240V
Frequency	50/60 Hz	50/60 Hz
Max Line Current	25A	32A
Phase Current	25A	32A

Specification	10KVA	22KVA
Nominal Power Rating	10KVA	15KVA
Recommended Circuit Breaker	30A	30A
Outlets	42 x C13 6 x C19	42 x C13 6 x C19
Outlet Groups	6	6
Max Group Current	20A	20A
Output Voltage	200-240V	200-240V
Data Centre Receptacle	1ph 2W + ground 32A IEC60309 3P 6H 230V	1ph 2W + ground 32A IEC60309 3P 6H 230V

TABLE 6 Specifications for EMEA and APAC High-Voltage Three Phase PDUs

Specification	11KVA	15KVA	24KVA	33KVA	37KVA
Number of Inputs	1	1	2	3	3
Source Voltage	220/380 - 240/415VAC 3Ø	220/380 - 240/415VAC 3Ø	220/380 - 240/415VAC 3Ø	220/380 - 240/415VAC 3Ø	220/380 - 240/415VAC 3Ø
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Max Line Current	16A	21A	16A	16A	18A
Phase Current	16A	21A	16A	16A	18A
Nominal Power Rating	11KVA	15KVA	24KVA	33KVA	37KVA
Recommended Circuit Breaker	16/20A	25A	25A	16/20A	25A
Outlets	42 x C13 6 x C19	42 x C13 6 x C19	42 x C13 6 x C19	42 x C13 6 x C19	42 x C13 6 x C19
Outlet Groups	6	6	6	6	9
Max Group Current	20A	20A	18A	16A	18A
Output Voltage	220-240V	220-240V	220-240V	220-240V	220-240V
Data Centre Receptacle	3ph 4W + ground 16A IEC60309 5P 6h 400V	3ph 4W + ground 32A IEC60309 5P 6h 400V	3ph 4W + ground 32A IEC60309 5P 6h 400V	3ph 4W + ground 32A IEC60309 5P 6h 400V	3ph 4W + ground 32A IEC60309 5P 6h 400V

PDU Input Leads and Outlet Groups on Single-Phase PDUs

This table lists the input leads and outlet groups for both original PDUs and enhanced PDUs.

TABLE 7 Relationship Between Input Lead and Powered Outlet Groups on Single-Phase PDUs

PDU Type	Input Lead [†]	Outlet Groups
5 kVA	0	0, 1, 2, 3, 4, 5
10 kVA	0	0, 1, 2
10 kVA	1	3, 4, 5
15 kVA, 22 kVA	0	0, 1
15 kVA, 22 kVA	1	2, 3
15 kVA, 22 kVA	2	4, 5

[†]If no power is applied to an input lead, the corresponding outlet groups will not provide power and the capacity of the PDU will be reduced.

PDU Input Leads and Outlet Groups on Three-Phase PDUs

This table lists the input leads and outlet groups for both original PDUs and enhanced PDUs.

TABLE 8 Relationship Between Input Lead and Powered Outlet Groups on Three-Phase PDUs

PDU Type	Input Lead [†]	Outlet Groups
15 kVA	0	0, 1, 2, 3, 4, 5
24 kVA	0	0, 1, 2
24 kVA	1	3, 4, 5

[†]If no power is applied to an input lead, the corresponding outlet groups will not provide power and the capacity of the PDU will be reduced.

Environmental Specifications

See the table below for PDU environmental specifications.

TABLE 9 Environmental Specifications

Specification	Definition or Range
Protection class	I
Protection type	IP 20
Overvoltage category	II
Contamination level	2
Operating temperature range	0° C / 32° F to 40° C / 104° F
Relative humidity	10% to 90%, noncondensing
Maximum altitude	3000m / 9842.52 ft above sea level

Preparing for Installation

These PDUs are designed exclusively for the Oracle Rack Cabinet family of rack cabinets. Install the PDUs into the Oracle Rack Cabinet before installing other equipment. Refer to the *Oracle Rack Cabinet User's Guide* for information about installing equipment into the cabinets.

Note - The three-phase PDUs (both the high-voltage and low-voltage versions) are not supported in the Oracle Rack 1042. If your equipment requires a three-phase PDU, use the Oracle Rack 1242 instead.

- [“Safety Notices” on page 25](#)
- [“Tools” on page 27](#)
- [“Attach an Antistatic Wrist Strap” on page 28](#)
- [“Attach a Grounding Strap” on page 29](#)
- [“Install Equipment” on page 29](#)

Safety Notices

Before installing the PDU into the rack, observe the following safety and usage notices.



Caution - PDU installation and configuration must be done by qualified personnel with experience installing similar hardware.



Caution - Before installing and using the PDU, check it for any external damage. If the PDU is damaged, do not install or operate the PDU and contact your service representative.



Caution - The PDU, and any electrical equipment connected to it, can be damaged by power load ratings above the values listed in [“PDU Electrical Specifications” on page 20](#).



Caution - Do not use the PDU in damp rooms. If a liquid spills on the PDU, or if the PDU becomes damp from condensation, immediately disconnect the power input lead connector from the AC power supply. Contact your service representative before using the PDU again. You might need to return it for inspection.



Caution - Choose the maximum permitted fuse/circuit breaker load in the building according to the values listed in “[PDU Electrical Specifications](#)” on page 20. Observe all national and local regulations, safety provisions, and fuse load variations.



Caution - Never bend, or rest any object on, a PDU's power input lead.



Caution - Ensure that the total power consumed by all of the connected equipment does not exceed the respective nominal power rating of the PDU.



Caution - Always provide an easily accessible safety disconnect for units with fixed connections.



Caution - When connecting equipment to the PDU, ensure that you install the most symmetrical load to all of the phases as possible.



Caution - Elevated Operating Ambient – If equipment installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than the room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.



Caution - Reduced Air Flow – Install equipment in the rack in a way that does not compromise the amount of air flow required for the safe operation of the equipment.



Caution - Mechanical Loading – Mount equipment in the rack to prevent a hazardous condition due to uneven mechanical loading.



Caution - Circuit Overloading – When connecting equipment to the PDU, consider the damaging effect that overloading the circuits might have on overcurrent protection and supply wiring. Always review the equipment nameplate ratings when considering circuit overloading issues.



Caution - Reliable Earthing – Always maintain the reliable earthing of rackmounted equipment. Give particular attention to supply connections other than the direct connections to the branch circuit (for example, when using power strips).

ESD Precautions

Electronic equipment is susceptible to damage by static electricity. Use a grounded antistatic wriststrap, footstrap, or equivalent safety equipment to prevent electrostatic damage when you install or service the server.



Caution - To protect electronic components from electrostatic damage, which can permanently disable the server or require repair by service technicians, place components on an antistatic surface, such as an antistatic discharge mat, an antistatic bag, or a disposable antistatic mat. Wear an antistatic grounding strap connected to a metal surface on the chassis when you work on server components.

Tools

Prior to installing a PDU into your rack, prepare the work area and assemble the following tools:

- T-25 Torx wrench key (included in the Oracle Rack 1242 shipping kit)
- T-30 Torx wrench key (included in the Oracle Rack 1242 shipping kit)
- PDU mounting brackets and M6 screws (included in the PDU shipping kit)
- Cable routing support brackets and M6 screws (included in the PDU shipping kit)
- M5 shipping screws and washers (included in the PDU shipping kit)

You also must supply:

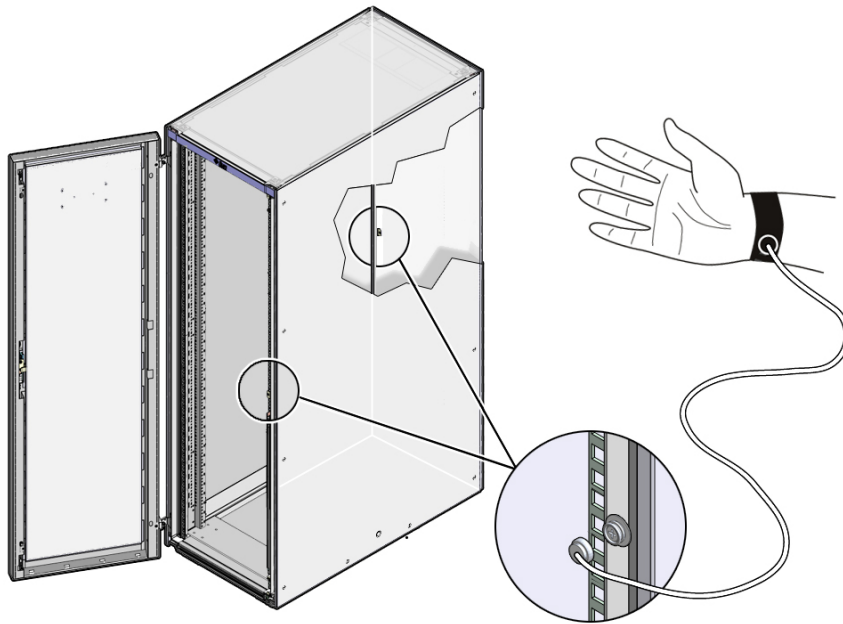
- Antistatic wrist strap
- Tie wraps
- Clean work table, or area, near the rack



Caution - Because of their size and weight, you will need another person to help lift and install the PDU into the rack (see [“PDU Physical Specifications” on page 19](#) to review the size and weights of each PDU). You might also need additional help when routing the PDU power input cables.

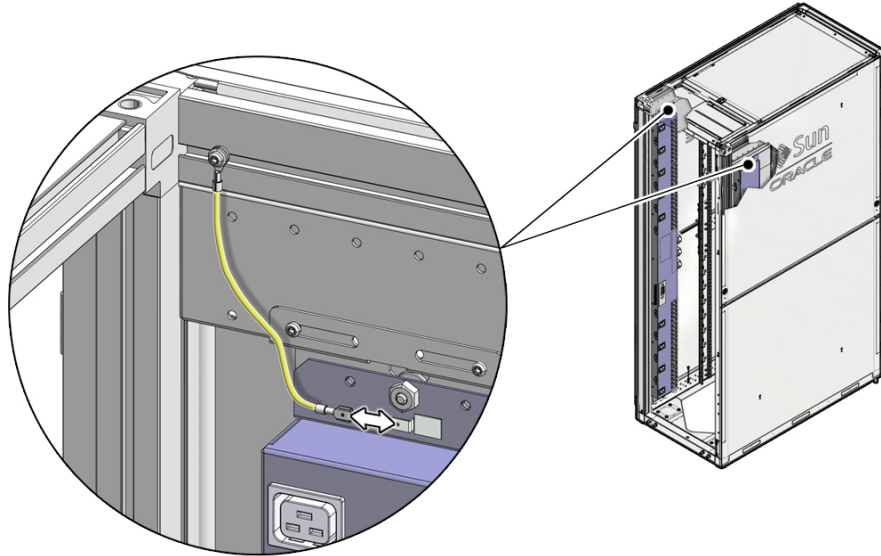
▼ Attach an Antistatic Wrist Strap

- Attach a wrist strap to your wrist and to the ESD grounding jack on the rear rail of the rack.



▼ Attach a Grounding Strap

- Attach a grounding strap from the rack to the top of the PDU.



▼ Install Equipment

- Install all hardware you want in the rack.
Refer to the installation guide for each type of hardware.

Installing PDUs Into a Oracle Rack 1242 Cabinet

Always install the PDUs prior to installing equipment into the rack. Complete these tasks to install the PDU and connect it to the installation site's AC power source.

- [“Installing PDUs” on page 31](#)
- [“Connect the PDU to the AC Power Source” on page 38](#)
- [“Power on the Equipment” on page 40](#)

Installing PDUs

These topics describe how to install PDUs.

- [“Prepare to Install a PDU” on page 31](#)
- [“Install a PDU” on page 33](#)

▼ Prepare to Install a PDU

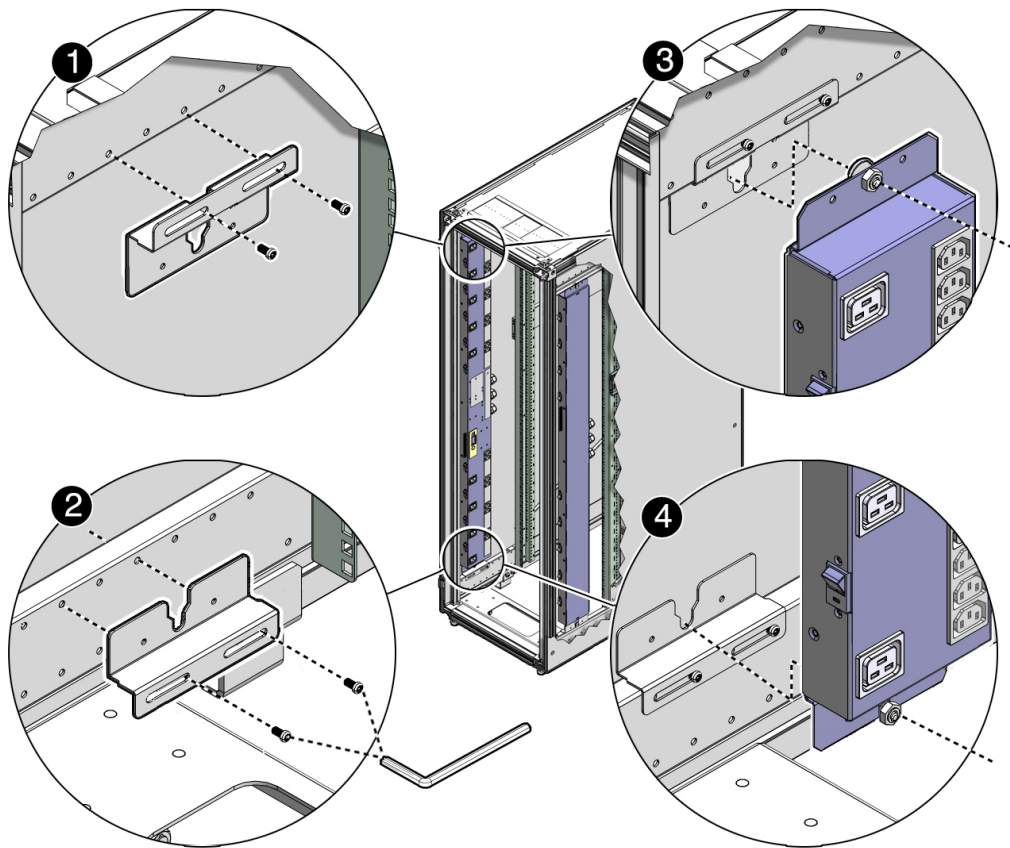
- 1. Unpack the PDU from its packaging and place it on a clean work table.**
Included with the PDU are two PDU mounting brackets, a cable routing bracket, screws, and washers.
- 2. Open the rear doors of the rack and determine where to install the PDU.**
You can install up to two PDUs, one per side, into the Oracle Rack 1242 cabinet. You can install these PDUs anywhere between the rear RETMA rail and the rack's rear frame. Provide adequate space to route the power input lead cords and any equipment data cables.
- 3. Attach an antistatic strap to your wrist and to a banana jack socket on the rack.**

See [“Attach an Antistatic Wrist Strap” on page 28](#) and [“Attach a Grounding Strap” on page 29](#).

- 4. Using a T-30 Torx wrench key, secure the top and bottom PDU mounting brackets to the top rack frame using two M5 screws per bracket.**

See the following figure, panels 1 and 2.

Each mounting bracket contains two additional screw holes used to secure a PDU to the bracket when a PDU ships in a rack from the factory. Ignore these shipping screw holes when installing the PDU into the rack.



- 5. Install a PDU into the rack.**

See [“Install a PDU” on page 33](#).

▼ Install a PDU

1. **Lift up the PDU, and ensuring that the circuit breakers are facing the rear of the rack, carefully set the PDU's standoff bolts into the top and bottom bracket's keyhole slots.**

See the figure in [“Prepare to Install a PDU” on page 31](#), panels 3 and 4).



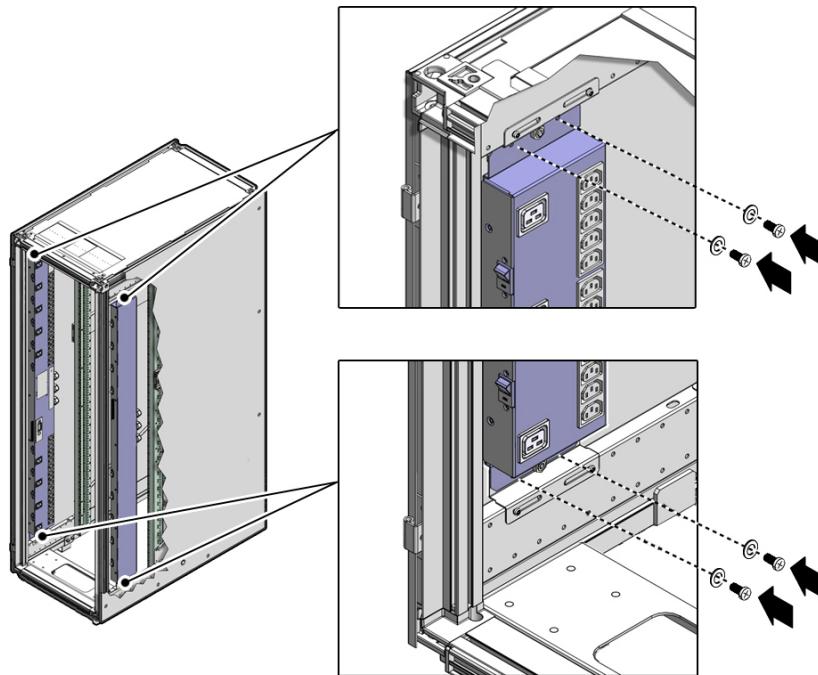
Caution -You need two people to lift and secure the PDU to the rack.

The PDU is held in the rack by gravity, with the standoff bolts resting in the mounting brackets' keyhole slots.

Note - The circuit breakers must face the rear of the rack so that you can reset a breaker if one trips.

2. **(Optional) Use a T-25 Torx wrench and four M5 shipping screws and washers to secure the PDU to the mounting brackets.**

For extra durability, secure the PDU to the mounting brackets using the shipping screws and washers (two screws and washers per bracket). If you plan to ship the rack to another location, you *must* secure the PDU using these shipping screws.



3. Route the power input lead cords between the rear RETMA rail and side panel.

A PDU has one to three power input lead cords, which you must route between the side panel and the rear RETMA rail.

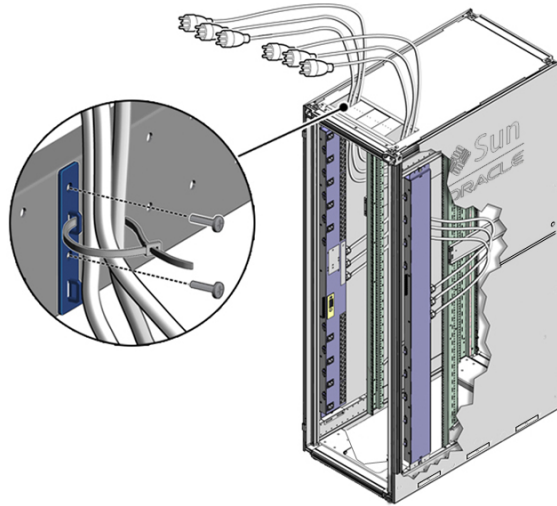
Route the power input lead cords either down through the bottom of the rack or up through the top of the rack, depending on where you plan to connect them to the main power source.

If you are routing the cables through the bottom of the rack, refer to the *Oracle Rack 1242 User's Guide* for the dimensions of the floor cutout.

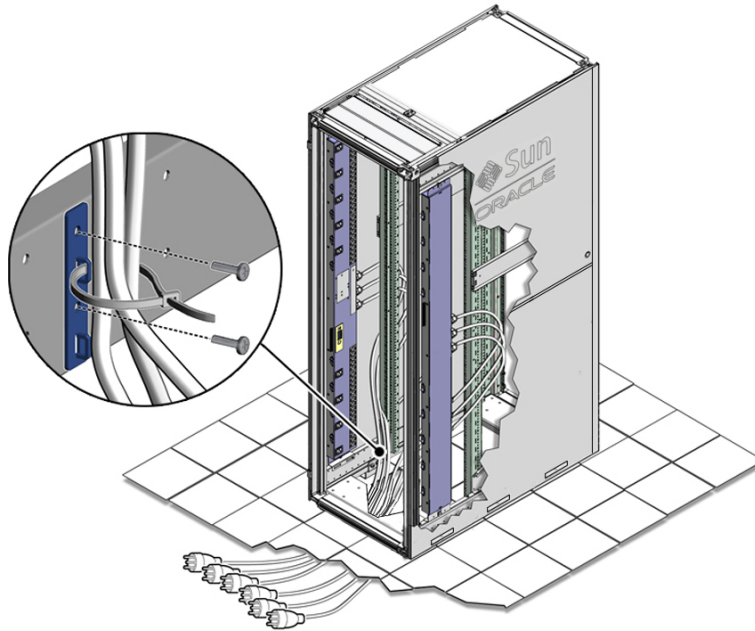


Caution - Never twist, kink, or tightly bend a power input lead.

Routing PDU cables up through the top of the rack.



Routing PDU cables through the bottom of the rack.



Caution - If you route power input lead cords through the top cable window, do not rest the cables on the plastic sliding doors.

4. **Use a T-30 Torx wrench to secure cable routing brackets to the rack frame using two M6 screws per bracket.**
Install these brackets near where the power input leads exit the rack (see the figures in [Step 3](#)).
5. **Using tie-wraps, secure the PDU input lead cables to the cable routing brackets.**
6. **Determine your next steps.**
 - If you are installing a second PDU into the rack, follow [Step 1](#) through [Step 5](#) to install the second PDU.
 - If you are done installing PDUs and want to power on the rack, go to [“Connect the PDU to the AC Power Source”](#) on page 38.

Connecting the PDU to the AC Power Source

Before connecting the PDU to the AC power source, determine your type of PDU for the locations of the circuit breakers.

- [“Circuit Breaker Overview” on page 37](#)
- [“Circuit Breaker Locations” on page 38](#)
- [“Connect the PDU to the AC Power Source” on page 38](#)
- [“Connect Equipment Power Cords to PDUs” on page 39](#)

Circuit Breaker Overview

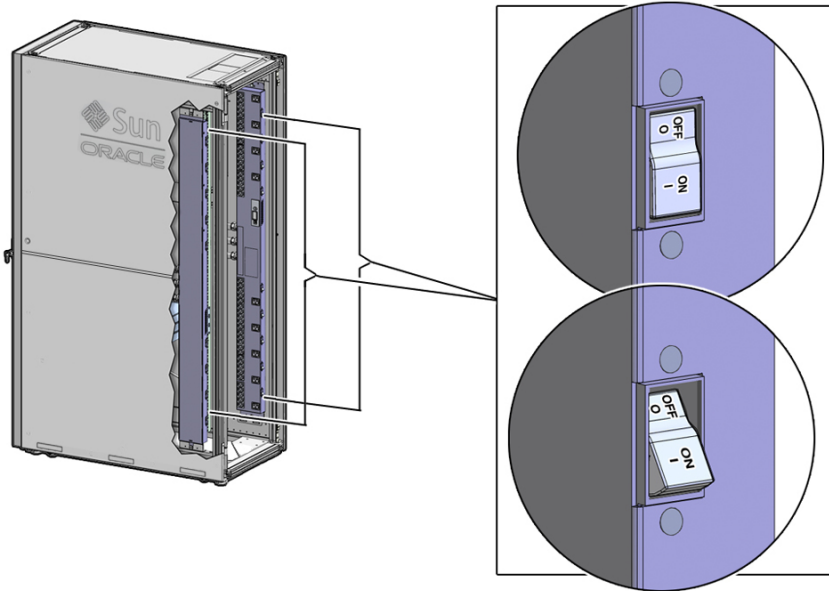
Each PDU contains a circuit breaker for each outlet group. These circuit breakers are safety devices to protect equipment from damage and you from personal injury. A circuit breaker trips and shuts the power off to an outlet group when it detects an overloaded circuit, a short circuit, or another fault condition.

When operating normally in the On (I) position, the circuit breakers are flush with the side of the PDU. When tripped to the Off (O) position, the circuit breakers extend beyond the side of the PDU.



Caution - To prevent injury and equipment damage, always determine the cause of a tripped circuit breaker before resetting it.

Circuit Breaker Locations



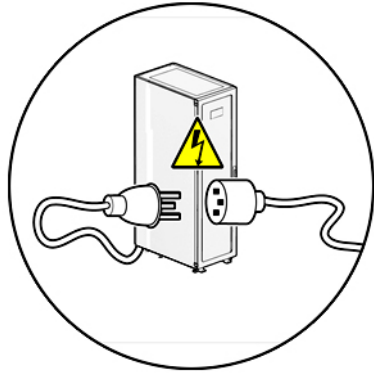
▼ Connect the PDU to the AC Power Source



Caution - Before connecting the input lead cords to the AC power source, make sure that all of the PDU circuit breakers are at the Off position.

- 1. Switch off every PDU circuit breaker.**
Press down on every Off circuit breaker toggle switch to switch off the PDU.
See either [“Circuit Breaker Locations”](#) on page 38.
- 2. Locate the PDU input lead cord connectors.**
Depending on how you routed the cords when you installed the PDUs, route these cords either out the bottom of the rack or out the top.
- 3. Connect the PDU power lead cords to the facility AC power source.**

If your rack contains two PDUs, connect each PDU to different AC power source circuits in the building whenever possible. You can also make a PDU with multiple AC inputs into a pseudo-redundant PDU by connecting each power input lead into a different building circuit.



4. **Switch on every PDU circuit breaker to power on the PDU.**

See [“Circuit Breaker Locations”](#) on page 38.

▼ Connect Equipment Power Cords to PDUs

After installing equipment into the rack, connect the power cords to the PDUs.

Note - Refer to the *Oracle Rack Cabinet User's Guide* and your equipment documentation for instructions on installing equipment into the rack.

- **Connect the power cords using these guidelines.**

As you connect power cords, label each power cord and note which outlet it is connected to, in case you need to replace or move equipment in the rack.

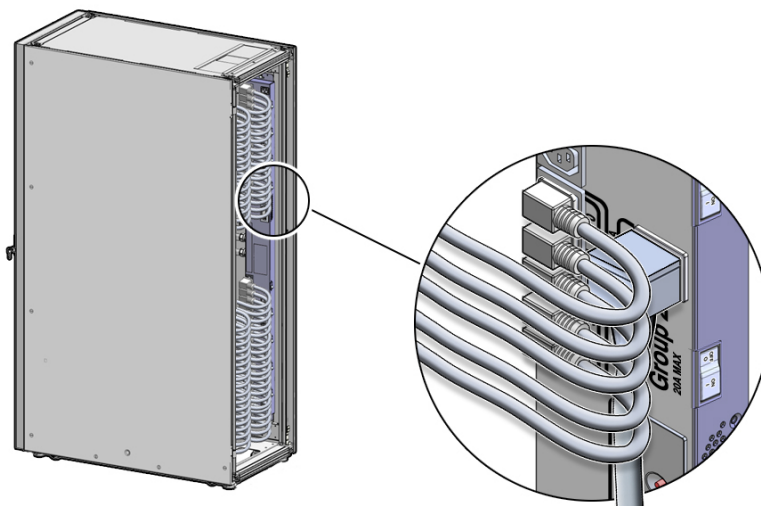


Caution -When connecting equipment to the PDU, ensure that you install the most symmetrical load to all of the phases as possible.



Caution -Circuit Overloading – When connecting equipment to the PDU, consider the damaging effect that overloading the circuits might have on overcurrent protection and supply wiring. Always review the equipment nameplate ratings when considering circuit overloading issues.

- When routing jumper cords, avoid cluttering the center of the rack by first routing the jumper cords away from the PDU. Then route the jumper cords through your equipment cable management device to your equipment.



- Do not connect all of the equipment to the same PDU group of sockets.
- For equipment with dual redundant power supplies (two power supplies), connect each power supply to different PDUs.

▼ Power on the Equipment

- **Power on all the equipment in the rack.**
Refer to the equipment documentation for the correct power-on procedures.

Connecting PDUs to the Network

Both original and enhanced PDUs contain a metering unit that enables you to monitor the current (in amperes) being used by the connected equipment. The enhanced PDU metering unit enables you to monitor voltage, power, apparent power, and energy. Before you can monitor the PDU remotely, you must first connect it to the network.

These topics describe how to connect a PDU metering unit to the network. The metering unit supports both DHCP and static IP addressing. After connecting the metering unit to the network, see [“Monitoring Original PDUs” on page 61](#) or [“Monitoring Enhanced PDUs” on page 95](#) for instructions on how to configure and monitor a PDU.

Description	Links
Connect an original PDU to a DHCP network.	“Connect an Original PDU to a DHCP Network” on page 42
Connect an original PDU to a network using a static IP address.	“Prepare to Connect an Original PDU to a Static IP Address Network” on page 46 “Configure a Windows PC for a Point-to-Point Connection” on page 47 “Configure an Oracle Solaris System for a Point-to-Point Connection” on page 50 “Connect an Original PDU to a Static IP Address Network” on page 51 “Crossover Cable Pinout Diagram” on page 54
Connect an enhanced PDU to a DHCP network.	“Connect an Enhanced PDU to a DHCP Network” on page 55
Connect an enhanced PDU to a network using a static IP address.	“Connect an Enhanced PDU to a Static IP Address Network Through a SER MGT Port” on page 56 “Connect an Enhanced PDU to a Static IP Address Network Through a DHCP-Capable Network” on page 58

Connecting an Original PDU to a Network

Before you can set threshold alarms or monitor a PDU remotely, you must first connect the PDU metering unit to an Ethernet network.

- [“Connect an Original PDU to a DHCP Network” on page 42](#)
- [“Prepare to Connect an Original PDU to a Static IP Address Network” on page 46](#)
- [“Configure a Windows PC for a Point-to-Point Connection” on page 47](#)
- [“Configure an Oracle Solaris System for a Point-to-Point Connection” on page 50](#)
- [“Connect an Original PDU to a Static IP Address Network” on page 51](#)
- [“Crossover Cable Pinout Diagram” on page 54](#)

▼ Connect an Original PDU to a DHCP Network

1. Gather the following:

- Access to the PDU metering unit
- An Ethernet cable to connect the metering unit to the network
- Two people—one to connect the power input lead and another to press the reset button on the metering unit
- A system on the network to log into the PDU metering unit

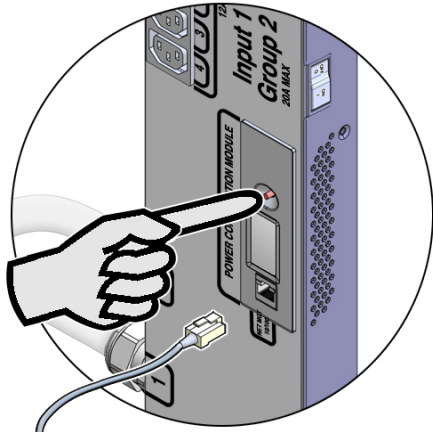
2. Confirm with your network administrator that your DHCP server can accept new media access control (MAC) addresses.

For security reasons, some network administrators disable devices with unknown MAC addresses from connecting to the DHCP network.

3. If you have already connected the PDU's power input leads to the AC power source, disconnect the power input leads to power off the PDU.

4. Connect an Ethernet cable to the PDU metering unit's RJ-45 Ethernet port and to the network.

5. While one person presses and holds down the PDU metering unit reset button, another person must connect the PDU power input lead to the AC power source.



Connect only one PDU power input lead to power on the metering unit:

- On PDUs that have one power input lead, connect that one power lead to the AC power source.
- On PDUs with two power leads, connect the first power lead (labeled 0) to the AC power source.
- On PDUs with three power input leads, connect the middle power lead (labeled 1) to the AC power source.

Note -Press the reset button until the PDU metering unit powers on.

When you power on the PDU metering unit while pressing down on the reset button, you temporarily enable it to connect to a DHCP network. The DHCP server assigns an IP address to the metering unit and connects it to the network. However, if the PDU resets or power cycles, the PDU metering unit forgets this temporary DHCP setting.

Note - To enable DHCP network connections permanently, you must configure the metering unit to accept IP addresses only from DHCP servers.

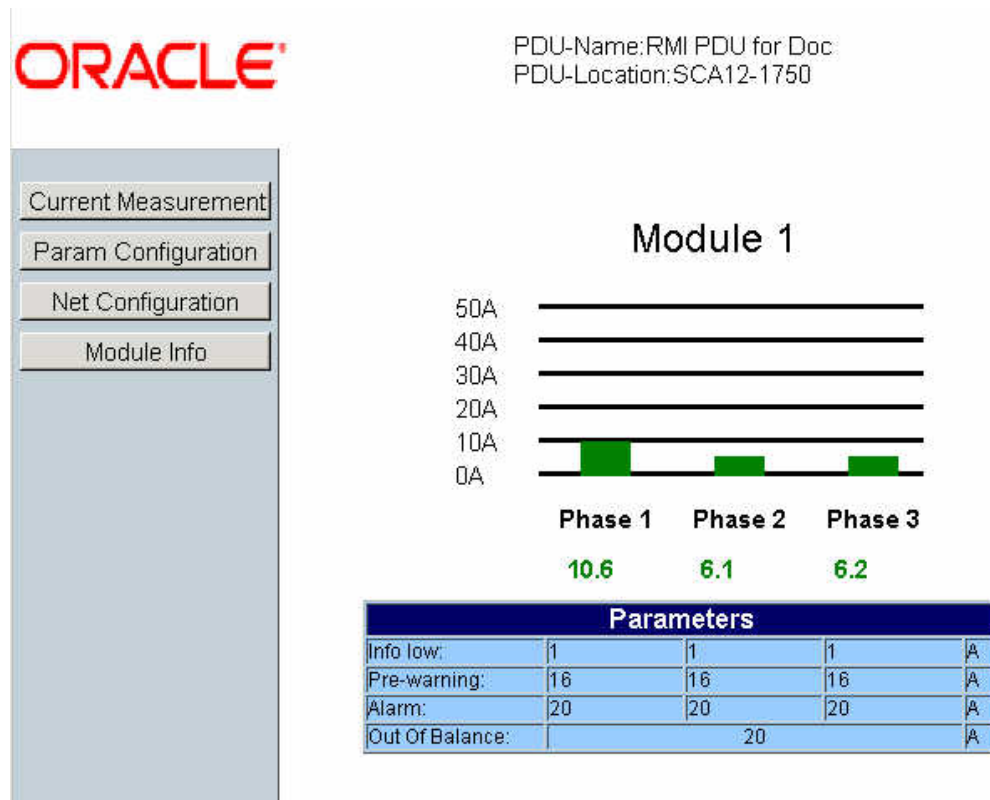
6. **Ask your network administrator for the IP address that the DHCP server assigned to the PDU metering unit.**

Refer to the DHCP server's documentation for instructions on listing devices connected to the DHCP network.

Note - The metering unit's LCD screen displays the IP address while the PDU powers on. See [“Monitor an Original PDU \(LCD Screen\)”](#) on page 70 for more information.

7. **Type the metering unit's IP address into the web browser's address line.**

On a system connected to the network, use a web browser to log on to the PDU metering unit. Once connected, the web browser displays the Current Measurement page.



8. **Click the Net Configuration link on the upper left side of the page.**

The browser prompts you to log into PDU metering unit.

9. Log in to the PDU metering unit as an admin user.

See “[Login Information](#)” on page 60. Once logged in, the browser displays the Network Configuration page.

10. Click the DHCP enable checkbox to make the metering unit obtain IP addresses only from DHCP servers.

After clicking this checkbox, the other IP address configuration fields become unavailable.

Net - Configuration

DHCP enable:

IP - Address:

Subnetmask:

Default Gateway

Display Time:

11. Click the Submit button to reset the PDU metering unit.

After resetting, the PDU metering unit obtains a new IP address from the DHCP server. Ask your network administrator for the IP address that the DHCP server assigned to the PDU metering unit.

12. If necessary, connect the remaining PDU power input leads to the AC power source.

▼ Prepare to Connect an Original PDU to a Static IP Address Network

In order to configure the PDU metering unit to use a static IP address, you must first connect the PDU metering unit to a system using a point-to-point connection. After making this point-to-point connection, you can configure the static IP network settings.

1. **Gather the following:**
 - An Oracle Solaris system or PC system, which you use to make a point-to-point connection to the PDU metering unit
 - A crossover patch cable, needed to connect the system with the PDU metering unit (see [“Crossover Cable Pinout Diagram”](#) on page 54 for the pin descriptions of a crossover patch cable)
 - A standard Ethernet cable for the final network connection
 - A system on the network to log in to the PDU metering unit
2. **Ask your network administrator for the following information about the network:**
 - IP address—a permanent IP address for the PDU metering unit
 - Subnetmask number—identifies the local portion of the local area network (LAN)
 - Default gateway—address of a router or a system on the network that serves as an access point to another network
3. **If you have already connected the PDU's power input leads to the AC power source, disconnect the power input leads to power off the PDU.**
4. **Use one of the following procedures to configure your Oracle Solaris system or PC system for a point-to-point connection:**
 - [“Configure a Windows PC for a Point-to-Point Connection”](#) on page 47
 - [“Configure an Oracle Solaris System for a Point-to-Point Connection”](#) on page 50
5. **After configuring the system, connect the PDU to the network.**

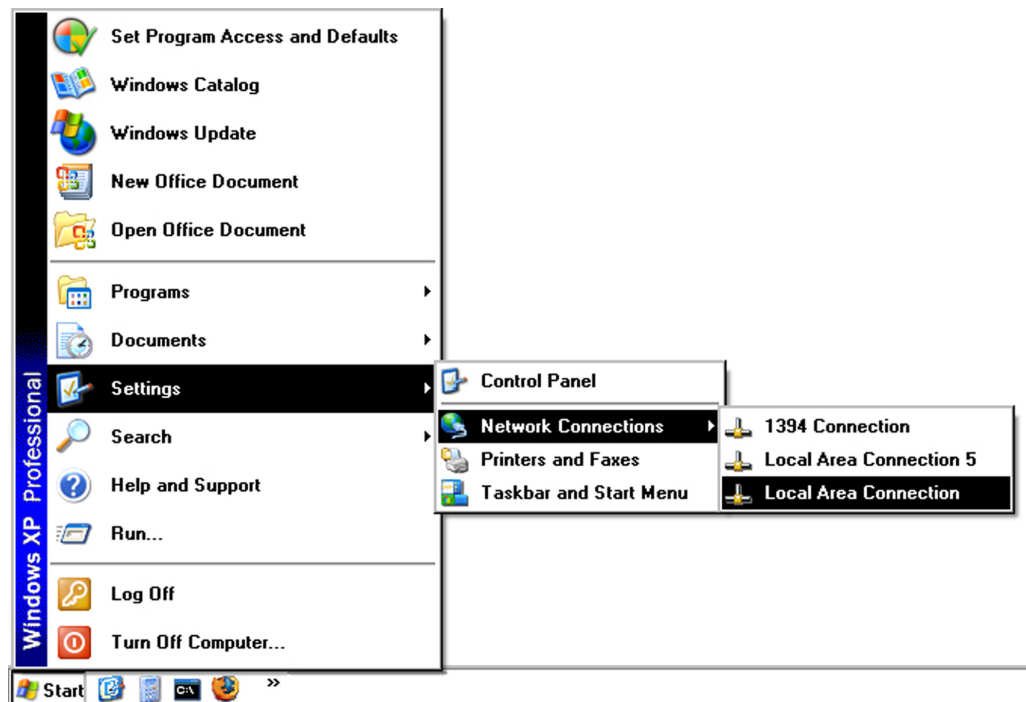
See [“Connect an Original PDU to a Static IP Address Network”](#) on page 51.

▼ Configure a Windows PC for a Point-to-Point Connection

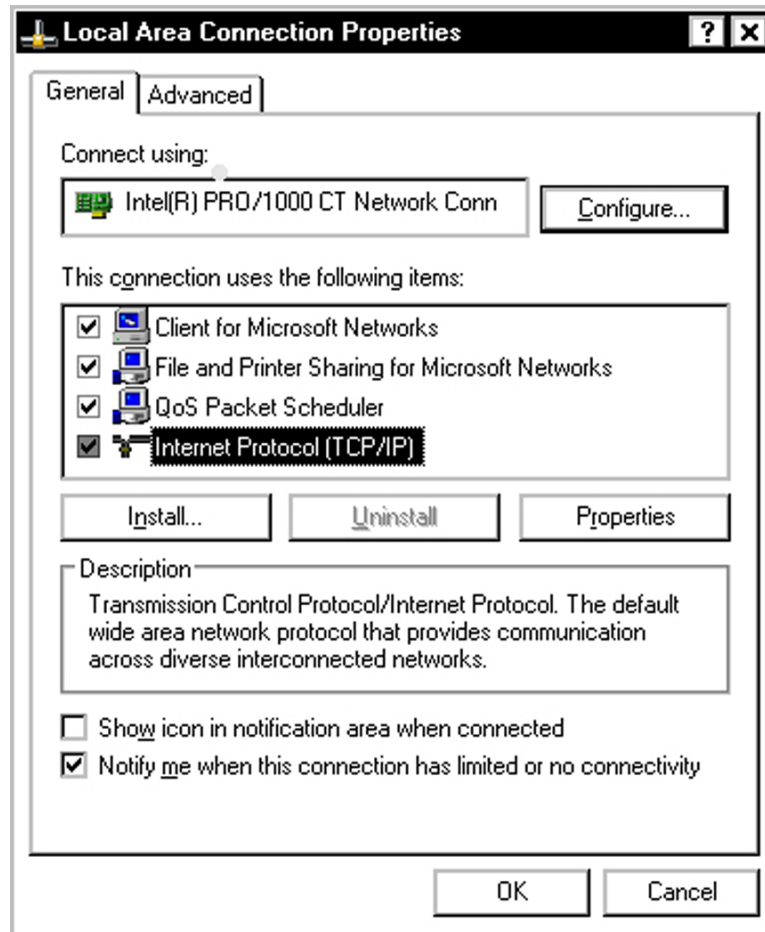
1. **Select an unused LAN network connection from the available network connections on your PC.**

From the Start menu, select Settings -> Network Connections -> *Local Area Connection*.

where *Local Area Connection* is an unused LAN connection.



Selecting the unused LAN connection displays its Local Area Connection Properties window.



2. In the Local Area Connection Properties window, double-click on Internet Protocol (TCP/IP) to display Internet Protocol (TCP/IP) Properties window.
3. In the Internet Protocol (TCP/IP) Properties window, configure the network for a crossover connection.

- a. Select the “Use the following IP address” option.

The screenshot shows the "Internet Protocol (TCP/IP) Properties" dialog box with the "General" tab selected. The dialog box contains the following elements:

- Title Bar:** "Internet Protocol (TCP/IP) Properties" with help and close buttons.
- General Tab:** A tab labeled "General".
- Text:** "You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings."
- Radio Buttons:**
 - Obtain an IP address automatically
 - Use the following IP address:
- IP Address Fields:**
 - IP address: 192 . 0 . 2 . 5
 - Subnet mask: 255 . 255 . 255 . 0
 - Default gateway: . . .
- Radio Buttons (DNS):**
 - Obtain DNS server address automatically
 - Use the following DNS server addresses:
- DNS Server Fields:**
 - Preferred DNS server: . . .
 - Alternate DNS server: . . .
- Buttons:** "Advanced...", "OK", and "Cancel".

- b. Type an IP address between 192.0.2.2 and 192.0.2.255 (for example, 192.0.2.5).

Do not use 192.0.2.1, since that address is the factory default PDU metering unit address.

- c. **Type 255.255.255.0 in the Subnet mask field.**
- d. **Leave the Default gateway field blank.**
- 4. **Click the OK button in the Internet Protocol (TCP/IP) Properties window to set these network properties.**
- 5. **Connect the PDU to the network.**
See [“Connect an Original PDU to a Static IP Address Network”](#) on page 51.

▼ Configure an Oracle Solaris System for a Point-to-Point Connection

1. **As superuser, use the `dladm` command to find an unused Ethernet interface.**

In the following example, the `dladm` command lists two Gigabit Ethernet interfaces (`ce0` and `ce1`) and the `ifconfig` command shows that only the `ce0` interface is being used. Refer to the `dladm(1M)` and `ifconfig(1M)` man pages for more information.

```
# dladm show-link
ce0          type: legacy    mtu: 1500      device: ce0
ce1          type: legacy    mtu: 1500      device: ce1
# ifconfig -a
lo0: flags=2001000849 <UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL> mtu 8232 index 1
inet 127.0.0.1 netmask ff000000
ce0: flags=1000843 <UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 2
inet 192.0.2.253 netmask ffffffff broadcast 192.0.2.255
ether 0:3:ba:7:84:5e
```

2. **Use the `ifconfig` command to plumb the unused network interface.**

```
# ifconfig interface plumb up
```

Replace *interface* with the network interface device (for example, `ce0`, `hme0`, `qfe1`, and so on). For example, to plumb an unused `ce1` interface, type:

```
#ifconfig ce1 plumb up
```

3. **Use the `ifconfig` command to assign an IPv4 address and netmask to the interface.**

```
# ifconfig interface IPv4-address netmask + netmaskbroadcast broadcastup
```

Replace:

- *interface* **with the network interface device**
- *IPv4-address* **with an address between 192.0.2.2 and 192.0.2.255**
- *netmask* **with 255.255.255.0**
- *broadcast* **with 192.0.2.255**

Note - These IP addresses are examples. Use the address ranges provided by your network administrator.

For example:

```
# ifconfig ce1 192.0.2.5 netmask + 255.255.255.0 broadcast 192.0.2.255 up
```

Note - Network interfaces explicitly configured using the `ifconfig` command do not persist across system reboots. If you prefer, refer to the Oracle Solaris documentation for information about setting a static IP address permanently.

4. **Connect the PDU to the network.**

See [“Connect an Original PDU to a Static IP Address Network”](#) on page 51.

▼ **Connect an Original PDU to a Static IP Address Network**

Prior to starting this procedure, configure a PC or Oracle Solaris system to permit a point-to-point connection to the PDU. For a PC, see [“Configure a Windows PC for a Point-to-Point Connection”](#) on page 47. See [“Configure an Oracle Solaris System for a Point-to-Point Connection”](#) on page 50 for an Oracle Solaris system.

1. **Connect a crossover patch cable from the system to the PDU metering unit's RJ-45 Ethernet port.**

Do not connect a standard Ethernet cable between the system and the PDU, since the internal pinouts for a crossover cable are different from the pinouts used in a standard Ethernet cable. See [“Crossover Cable Pinout Diagram” on page 54](#) for the pinout diagram of a crossover cable.

2. Connect the PDU power input lead to the AC power source.

You need to connect only one PDU power input lead to power on the PDU metering unit:

- **On PDUs that have one power input lead, connect that one power lead to the AC power source.**
- **On PDUs with two power leads, connect the first power lead (labeled 0) to the AC power source.**
- **On PDUs with three power input leads, connect the middle power lead (labeled 1) to the AC power source.**

3. On the system, use a web browser to log in to the PDU metering unit.

Type the metering unit's factory-default `0.0.0.0` address in the browser's address line. Once connected, the web browser displays the Current Measurement page.

4. Click the Net Configuration link found in the upper left side of the page.

The browser prompts you to log into the PDU metering unit.

5. Log in to the PDU metering unit as an admin user.

See [“Login Information” on page 60](#). Once logged in, the browser displays the Network Configuration page.

6. In the Network Configuration page, confirm that the DHCP Enabled checkbox is not selected, and type the network settings for the PDU metering unit. For example:

- **IP address**
- **Sub-netmask number**
- **Default gateway**

Note - These IP addresses are examples. Use the address ranges provided by your network administrator.

Net - Configuration

DHCP enable:

IP - Address:

Subnetmask:

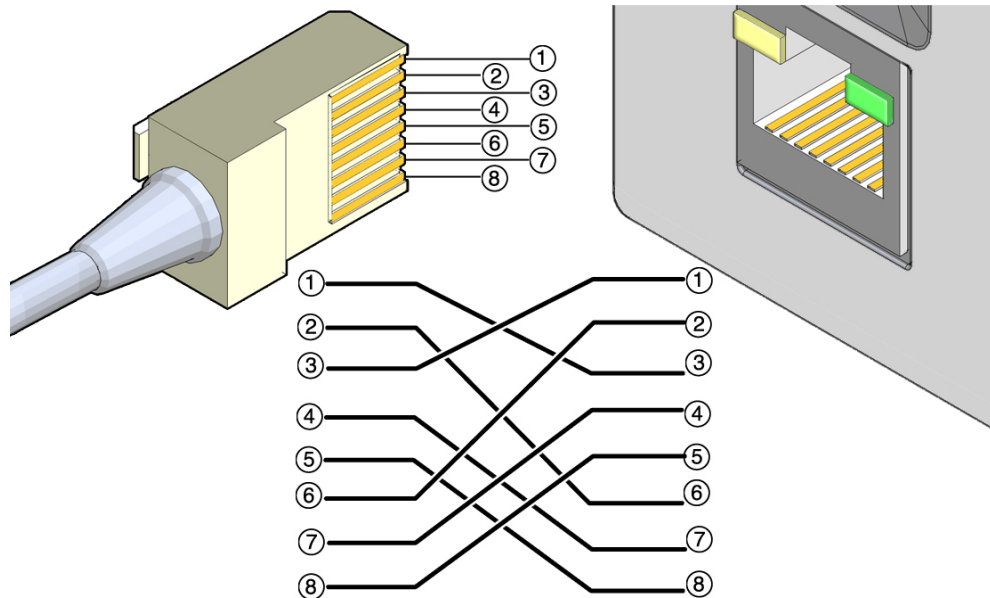
Default Gateway

Display Time:

Note - Display Time is the time the Net Configuration is displayed on the PDU LCD screen before the screen displays current measurements.

7. **Click the Submit button to set these network settings and reset the PDU metering unit.**
8. **Disconnect the crossover cable from the PDU metering unit.**
9. **Connect an Ethernet cable to the PDU metering unit's RJ-45 Ethernet port and to the network.**
10. **On a system connected to the network, use a web browser to log on to the PDU metering unit.**
Type the metering unit's static IP address into the browser's address line. If the network configuration was successful, the browser displays the Current Measurement page.
11. **Connect the remaining PDU power input leads to the AC power source.**

Crossover Cable Pinout Diagram



Connecting an Enhanced PDU to a Network

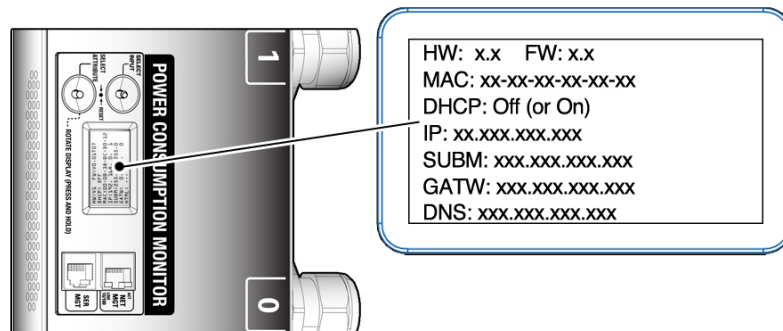
Before you can set threshold alarms or monitor a PDU remotely, you must first connect the PDU metering unit to an Ethernet network.

- [“Connect an Enhanced PDU to a DHCP Network” on page 55](#)
- [“Connect an Enhanced PDU to a Static IP Address Network Through a SER MGT Port” on page 56](#)
- [“Connect an Enhanced PDU to a Static IP Address Network Through a DHCP-Capable Network” on page 58](#)

Note - The enhanced PDU supports IPv6.

▼ Connect an Enhanced PDU to a DHCP Network

1. **Gather the following:**
 - Access to the PDU metering unit
 - An Ethernet cable to connect the metering unit to the network
 - A system on the network to log into the PDU metering unit
2. **Confirm with your network administrator that your DHCP server can accept new MAC addresses.**
For security reasons, some network administrators disable devices with unknown MAC addresses from connecting to the DHCP network.
3. **If you have already connected the PDU's power input leads to the AC power source, disconnect the power input leads to power off the PDU.**
4. **Connect an Ethernet cable to the PDU metering unit's RJ-45 Ethernet port and to the network.**
5. **Connect all the PDU power input leads to the AC power source.**
6. **Determine the IP address using one of the following ways:**
 - **Via LCD screen.**
Press the PDU input button the same number of times as the quantity of inputs to display the PDU IP information on the LCD screen.



- **Via RS-232 cable**

- a. **Connect an RS-232 cable between the SER MGT port and the host.**
- b. **Configure the host's terminal or terminal emulator settings.**
See [“Terminal Configuration Settings” on page 60.](#)
- c. **At the terminal device, log in to the PDU metering unit as an admin user.**
See [“Login Information” on page 60.](#)
- d. **After successful login, type `get net_ipv4_ipaddr`:**

```
pducli -> get net_ipv4_addr
```

▼ Connect an Enhanced PDU to a Static IP Address Network Through a SER MGT Port

1. **If you have already connected the PDU's power input leads to the AC power source, disconnect the power input leads to power off the PDU.**
2. **Connect an RS-232 cable between the SET MGT port and the host.**
3. **Connect all the PDU power input leads to the AC power source.**
4. **Configure the host's terminal or terminal emulator.**
See [“Terminal Configuration Settings” on page 60.](#)
5. **At the terminal device, log in to the PDU metering unit as admin.**
See [“Login Information” on page 60.](#)
6. **After successful login, type.**

```
pducli -> set net_ipv4_dhcp=Off  
pducli -> set net_ipv4_ipaddr=xxx.xxx.xxx.xxx  
pducli -> set net_ipv4_subnet=xxx.xxx.xxx.xxx  
pducli -> set net_ipv4_gateway=xxx.xxx.xxx.xxx  
pducli -> set net_ipv4_dns1=xxx.xxx.xxx.xxx  
pducli -> set net_ipv4_dns2=xxx.xxx.xxx.xxx  
pducli -> reset=yes
```


Use the IP address ranges provided by your network administrator.

For IPv6, use the commands shown in [“IPv6 Configuration Parameters”](#) on page 145.

7. **To verify that the settings are correct, connect an Ethernet cable between the NET MGT and the network.**

Note - HTTPS is the default setting.

8. **Type the IP address in a browser window.**

If the network configuration was successful, the browser displays the Metering Overview page.

The screenshot displays the Oracle PDU Metering Overview page. On the left is a navigation sidebar with the Oracle logo and menu items: Metering Overview (selected), Parameter, Net Configuration, and Module Info. Below the menu, it says 'Admin logged in!'. The main content area shows a table of PDU details, followed by two sections for power consumption: 'PDU Power Consumption' and 'Input 0'. Below 'Input 0' is 'Input 1'. Each input section includes a summary table and a detailed 'Values' table with columns for Phase, State, Current-Graph, Current, Voltage, Active Power, Apparent Power, and Energy.

PDU-Name	RMI PDU for Documentation
PDU-Product Identifier	
PDU-Rack Serial Number	
PDU-Location	SCA12-1750

PDU Power Consumption	
Total Active Power	3.8kW
Total Energy	88.4kWh

Input 0	
Active Power	1.9kW
Energy	44.7kWh

Values						
Phase	State	Current-Graph	Current	Voltage	Active Power	Apparent Power
1	✔		8.02A	120.3V	0.9kW	0.9kVA
2	✔		4.50A	122.2V	0.4kW	0.5kVA
3	✔		4.79A	121.7V	0.5kW	0.5kVA

Input 1	
Active Power	1.8kW
Energy	43.6kWh

Values						
Phase	State	Current-Graph	Current	Voltage	Active Power	Apparent Power
1	✔		7.81A	120.3V	0.9kW	0.9kVA
2	✔		4.63A	122.2V	0.4kW	0.5kVA
3	✔		4.48A	121.6V	0.4kW	0.5kVA

9. **Click on the Net Configuration link found in the upper left side of the page to view the IP settings.**

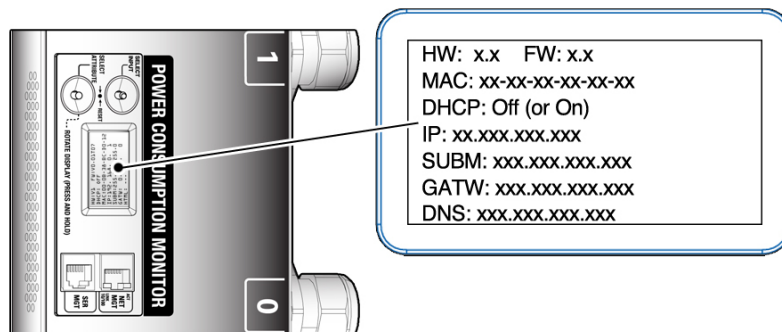
▼ Connect an Enhanced PDU to a Static IP Address Network Through a DHCP-Capable Network

1. **Confirm with your network administrator that your DHCP server can accept new MAC addresses.**

For security reasons, some network administrators disable devices with unknown MAC addresses from connecting to the DHCP network.

2. **If you have already connected the PDU's power input leads to the AC power source, disconnect the power input leads to power off the PDU.**
3. **Connect an Ethernet cable to the PDU metering unit's RJ-45 Ethernet port and to the network.**
4. **Connect all the PDU power input leads to the AC power source.**
5. **Determine the IP address on the LCD screen.**

Press the PDU Select Input button the same number of times as the quantity of inputs to display the PDU IP Information on the LCD screen.



6. **On the system, use a web browser to log in to the PDU metering unit.**
Type the metering unit's DHCP IP address in the browser's address line. Once connected, the web browser displays the Metering Overview page.
7. **Click the Net Configuration link found in the upper left side of the page.**
The browser prompts you to log into PDU metering unit.

8. **Log in to the PDU metering unit as an admin user.**
See “[Login Information](#)” on page 60. Once logged in, the browser displays the Network Configuration page.
9. **In the Network Configuration page, confirm that the DHCP Enabled checkbox is not selected, and type these network settings for the PDU metering unit:**
 - IP address
 - Sub-netmask number
 - Default gateway
 - DNS

The screenshot displays the Oracle PDU metering unit's web interface. On the left is a navigation menu with options: Metering Overview, Parameter, Net Configuration, Module Info, Admin logged in, and Logout. The main content area has a header with the Oracle logo and a table for device identification (PDU-Name, PDU-Product Identifier, PDU-Rack Serial Number, PDU-Location). Below this is a tabbed interface with the following tabs: IP-Settings, PDU-Information, HTTP-Access, SNMP-Access, SNMP-Traps, Syslog, SystemTime, EventLogging, Firmware Update, and StartUp /Reset. The IP-Settings tab is selected and contains three sections:

- Global IP-Settings:** Includes an IP-Mode dropdown menu set to IPv4 and a Submit button.
- IPv4-Settings:** Includes a DHCP enable checkbox (unchecked), and input fields for IP-Address, Subnetmask, Default Gateway, DNS-Server1, and DNS-Server2, with a Submit button.
- IPv6-Settings:** Includes input fields for SLAAC-LinkLocal Address, IPv6 manual Address, and a Submit button.

10. **Click the Submit button to set these network settings and reset the PDU metering unit.**
11. **On a system connected to the network, use a web browser to log on to the PDU metering unit.**
Type the metering unit's static IP address into the browser's address line. If the network configuration was successful, the browser displays the Metering Overview page.
12. **Click on the Net Configuration link found in the upper left side of the page to view the IP settings.**

Login Information

To log in to the PDU metering unit, type the user name (admin or user) and the password. Determine the password for your user name based on your firmware version.

Only one admin or user can be logged into the metering unit at a single time.

- `admin` – admin users can view all pages and configure all settings.
- `user` – for original PDUs, users can view the Current Measurement and the Module Info pages and set the thresholds on the Param Configuration page. For enhanced PDUs, users can view the Metering Overview and Module Info pages and set the thresholds on the Parameter page. See [“Add Users and Change Passwords \(Original PDU\)” on page 76](#) for original PDU instructions. See [“Add Users and Change Passwords \(Enhanced PDU\)” on page 111](#) for enhanced PDU instructions on adding users.

PDU Type	Minimum Firmware Version	User Name	Password
Original PDU	1.00	admin	admin
Original PDU	1.06	admin	adm1n
Enhanced PDU	2.00	admin	adm1n

You should change the password after configuring the network.

Terminal Configuration Settings

Configure the host's terminal or terminal emulator with these settings:

- 9600 baud
- 8 bit
- 1 stop bit
- no parity bit
- no flow control

Monitoring Original PDUs

The original PDU metering unit allows you to monitor the current being used by equipment connected to the PDU. You can monitor the current in person by viewing the LCD screen on the PDU itself or remotely from a system on the network.

Using the metering unit's HTML and SNMP interfaces, you can set threshold and alarm levels that you can monitor remotely. You also can configure the metering unit to send messages to systems on the network.

The following table lists the tasks necessary to configure and use the PDU metering unit.

Description	Links
Understand the relationship between the metering unit interface and the PDU outlet groups.	“Understanding the Relationship Between Modules and Outlet Groups” on page 61
Access the metering unit from a system on the network.	“Access a Metering Unit on the Network (Original PDU)” on page 66
Set the amperage threshold alarm values.	“Set Threshold Parameter Levels (Original PDU)” on page 67
Monitor the amperage levels.	“Monitoring an Original PDU” on page 69
Change the metering unit interface settings.	“Changing Interface Settings (Original PDU)” on page 75
Enable and configure SNMP settings.	“Enabling and Configuring SNMP (Original PDU)” on page 81
View the metering unit firmware version and update the firmware.	“Verifying and Updating the Firmware (Original PDU)” on page 86
Use the PDU metering unit's LCD screen.	“Administering the PDU Metering Unit (Original PDU)” on page 89
Restore the PDU metering unit's settings back to the factory default settings.	“Restore the PDU to Factory Default Settings (Original PDU)” on page 92

Understanding the Relationship Between Modules and Outlet Groups

These topics describe the relationship between modules and outlet groups.

- [“Relationship Between Modules and Outlet Groups Overview” on page 62](#)

- [“Single-Phase PDU Module and Outlet Group Relationship” on page 63](#)
- [“Three-Phase PDU Module and Outlet Group Relationship” on page 65](#)

Relationship Between Modules and Outlet Groups Overview

The metering unit monitors modules, which are collections of PDU power outlet groups. Depending on the PDU, a module might contain all of the outlet groups on the PDU, or a subset of the groups. The metering unit monitors the current flowing through each module, not through each outlet group.

A metering unit module might also be divided into phases, which can either correspond to each power input lead in single-phase PDUs, or the separate phases in three-phase PDUs.

[“Single-Phase PDU Module and Outlet Group Relationship” on page 63](#) and [“Three-Phase PDU Module and Outlet Group Relationship” on page 65](#) show how the metering unit divides the outlet groups into modules and phases.

These topics also help you understand the metering unit's web interface, SNMP messages, system log messages, and LCD screen. For example, if your rack contains a high-voltage 37 kVA PDU and the PDU's LCD screen shows that phase 2 of module 3 is using excessive current, the equipment connected to outlet group 7 needs attention.

Note - Refer to the labels on the PDUs to see the locations of these outlet groups.

Single-Phase PDU Module and Outlet Group Relationship

FIGURE 2 Single-Phase PDU Metering Unit Module and Outlet Group Relationship

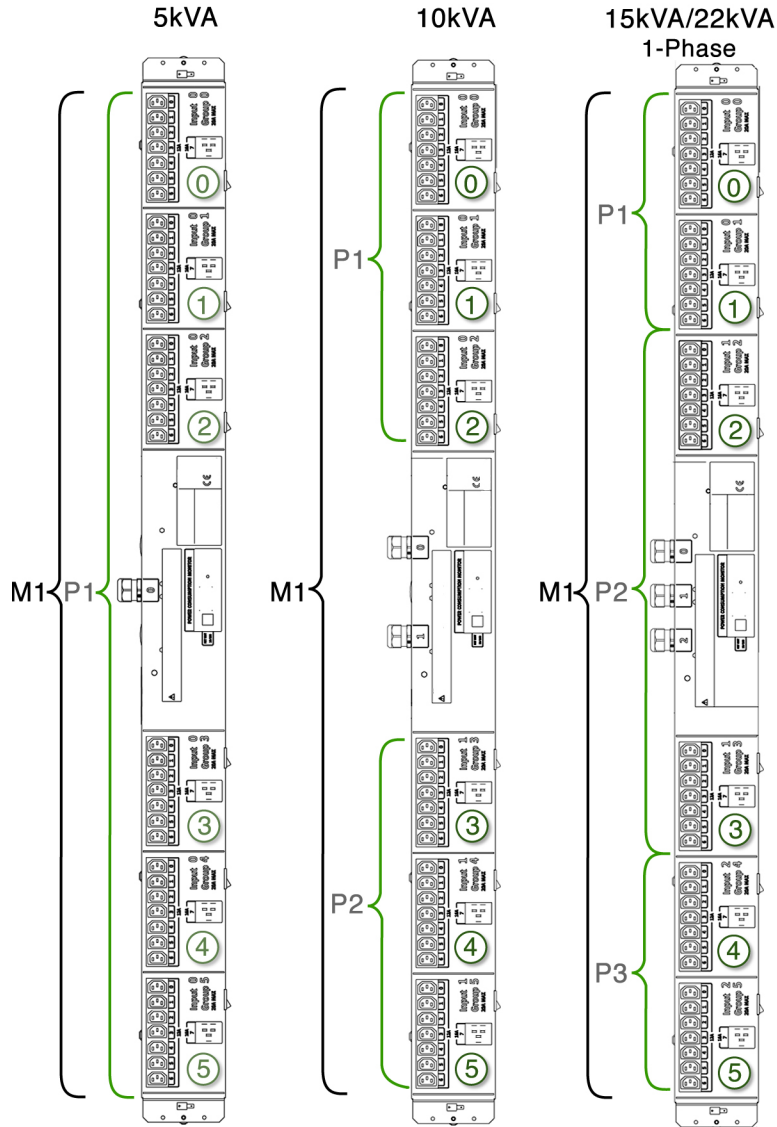
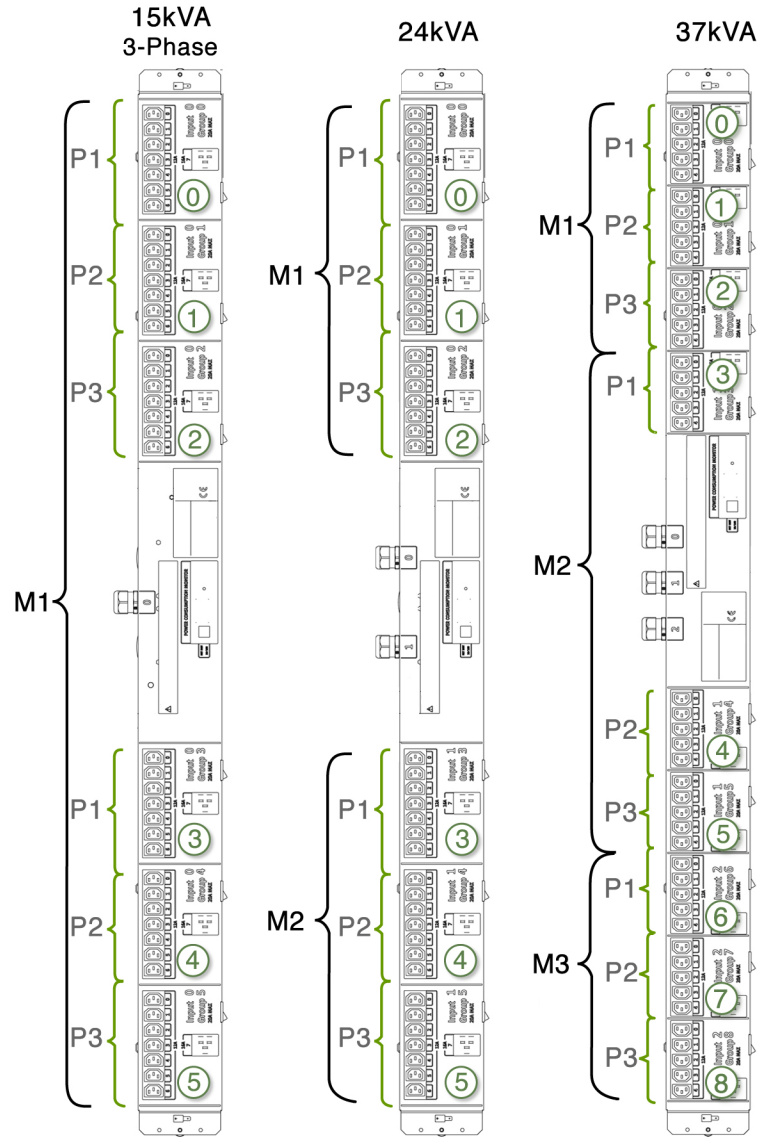


TABLE 10 Relationship Between Metering Unit Modules and Outlet Groups on Single-Phase PDUs

PDU Type	Metering Unit Module	Metering Unit Phase	Outlet Group	Power Input Lead Number
5 kVA	M1	Phase 1	0, 1, 2, 3, 4, 5	0
10 kVA	M1	Phase 1	0, 1, 2	0
10 kVA	M1	Phase 2	3, 4, 5	1
15 kVA, 22kVA	M1	Phase 1	0, 1	0
15 kVA, 22kVA	M1	Phase 2	2, 3	1
15 kVA, 22kVA	M1	Phase 3	4, 5	2

Three-Phase PDU Module and Outlet Group Relationship

FIGURE 3 Three-Phase PDU Metering Unit Module and Outlet Group Relationship



Note - For three-phase, low-voltage PDUs, each metering unit phase reports current from two outlet groups. Metering unit phase 1 reports a combination of current from outlet groups 0 and 2 (3 and 5 or 6 and 8 depending on which input). Metering unit phase 2 reports a combination of current from outlet groups 1 and 0 (4 and 3 or 7 and 6 depending on which input). Metering unit phase 3 reports a combination of current from outlet groups 2 and 1 (5 and 4 or 8 and 7 depending on which input).

TABLE 11 Relationship Between Metering Unit Modules and Outlet Groups on Three-Phase PDUs

PDU Type	Metering Unit Module	Metering Unit Phase	Outlet Group	Power Input Lead Number
15 kVA	M1	Phase 1	0, 3	0
15 kVA	M1	Phase 2	1, 4	0
15 kVA	M1	Phase 3	2, 5	0
24 kVA	M1	Phase 1	0	0
24 kVA	M1	Phase 2	1	0
24 kVA	M1	Phase 3	2	0
24 kVA	M2	Phase 1	3	1
24 kVA	M2	Phase 2	4	1
24 kVA	M2	Phase 3	5	1

▼ Access a Metering Unit on the Network (Original PDU)

After you connect the PDU metering unit to the network, you can use a web browser to access the metering unit from any system on the network.

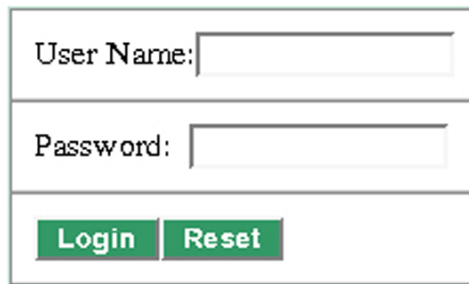
Note - The Original PDU supports both, 10/100 Full Duplex and 10/100 Half Duplex but not auto-negotiation as defined in IEEE802.3u. The Original PDU uses "auto detection" which means it configures itself to match the switch port. If a specific mode of operation is needed the switch port needs to be configured to the specific mode of operation.

- 1. Ask your network administrator for the IP address of the PDU metering unit.**
Use the static IP address you configured the metering unit to use, or ask your network administrator for the IP address assigned by the DHCP server. Refer to the DHCP server's documentation for instructions on listing devices connected to the DHCP network.
- 2. On a system connected to the network, type the metering unit IP address in a web browser's address line to connect to the PDU metering unit.**

Once connected, the browser displays the Current Measurement page.

Note - All users can view the Current Measurement and Module Info pages. If you attempt to view another page, you are prompted to log in. See the following figure.

Login



The image shows a login form with a white background and a thin black border. It contains three main sections: a 'User Name:' label followed by a text input field, a 'Password:' label followed by a text input field, and a bottom section with two green buttons labeled 'Login' and 'Reset'.

3. **When prompted, log in as an admin or a user.**
See [“Login Information” on page 60.](#)

▼ Set Threshold Parameter Levels (Original PDU)

The Current Measurement page displays the amps being used by each PDU module and phase, as well as a graphical measurement of the values. After you set amp threshold parameter levels, the page shows the graphical measurements in different colors, depending on how you set the threshold levels. See [“Monitor an Original PDU \(HTML Interface\)” on page 71](#) for more information.

1. **Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Original PDU\)” on page 66.](#)
2. **Click on the Param Configuration link and log in as either an admin or user.**
The Param Configuration page displays and identifies the PDU modules and phases. Depending on your PDU, you might have one or more modules with one or more phases per module. See

“Understanding the Relationship Between Modules and Outlet Groups” on page 61 for a description of PDU modules.

The image displays three identical configuration screens for Module 1, Module 2, and Module 3. Each screen is divided into several sections:

- Phase 1:** Contains three input fields for 'Info low:', 'Pre Warning:', and 'Alarm:', each with the value '0'.
- Phase 2:** Contains three input fields for 'Info low:', 'Pre Warning:', and 'Alarm:', each with the value '0'.
- Phase 3:** Contains three input fields for 'Info low:', 'Pre Warning:', and 'Alarm:', each with the value '0'.
- Out of Balance:** Contains one input field for 'Alarm:' with the value '0'.
- SNMP Traps:** Contains a label 'enable' and an unchecked checkbox.

At the bottom of each screen are two buttons: 'Submit' and 'Reset'.

3. For each module, type in current levels for each threshold parameter.
 - a. For each phase of the module, set the following parameters (in amps):
 - Info Low – A value when the attached equipment is not using enough current
 - Pre Warning – A value when the attached equipment is beginning to use too much current

- **Alarm – A value when the equipment is using a critical amount of current and requires immediate attention**

b. Set the Out of Balance amp level for the entire module.

A PDU can become out of balance if one phase uses more current than the others. Set the out of balance parameter to the number of amps that one phase cannot use more than any other in the module. For example, if you set this parameter to 5, and phase 1 uses 12 amps of current and phase 3 uses 4 amps, the Current Measurement page displays an out of balance error message.

Note - If the PDU module contains only one phase, the Out of Balance parameter is not available.

c. (Optional) If you have enabled SNMP control for the PDU, you can enable SNMP control for each PDU module.

If you enable SNMP on the Net Configuration page, you enable SNMP for all modules in the PDU. However, you can disable or enable SNMP control of each PDU module from this page. See [“Enable and Configure SNMP \(Original PDU\)” on page 82](#) for more information about SNMP settings.

d. Click the Submit button to set these threshold parameter values for the module.

If you want to reset all values, click the Reset button and then the Submit button.

4. Repeat [Step 3](#) for each PDU module.

Monitoring an Original PDU

You can monitor how much current the equipment connected to a PDU uses by either checking the PDU's LCD screen or by viewing the Current Measurement page using the HTML interface.

- [“Monitor an Original PDU \(LCD Screen\)” on page 70](#)
- [“Monitor an Original PDU \(HTML Interface\)” on page 71](#)

▼ Monitor an Original PDU (LCD Screen)

You can check the current being used by equipment attached to a PDU by viewing the PDU's metering unit LCD screen.

- 1. Locate the PDU you want to monitor in the rack.**

You might need to open the rack's rear door to access the PDU.

- 2. Locate the metering unit on the PDU.**

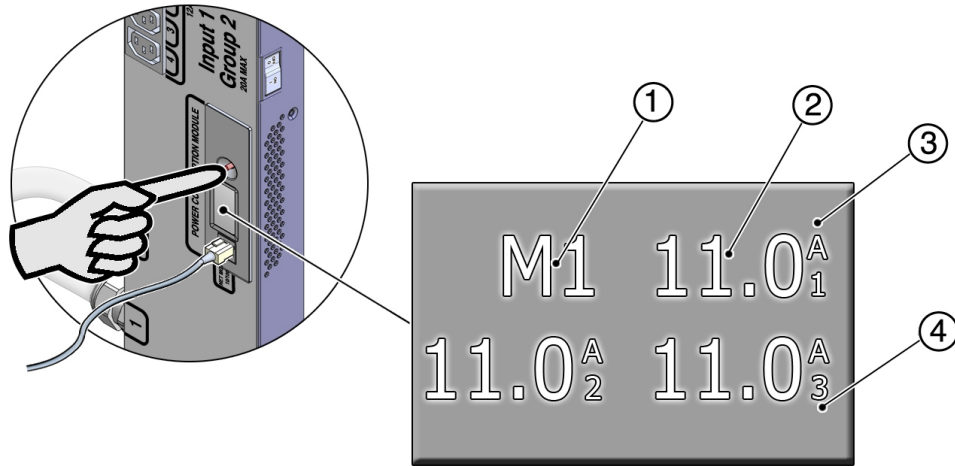
You can find the metering unit in the middle of the PDU.

- 3. Check the metering unit's LCD screen to view the current being used by the equipment connected to each PDU module.**

The LCD screen displays the amp measurements of all of the phases of a single PDU module. See [“Understanding the Relationship Between Modules and Outlet Groups” on page 61](#) for a description of PDU modules.

- **If your PDU has more than one module, press the reset button to cycle through the available modules.**

- For easier viewing, you can rotate the screen in 90-degree intervals by pressing the reset button for longer than 1 second. See [“Adjust the LCD Screen \(Original PDU\)”](#) on page 91 for more information.



No.	Description
1	Module number
2	Measured amp reading of the current being used by the equipment connected to the PDU phase
3	Abbreviation for amperes (amps)
4	Metering unit phase number

▼ Monitor an Original PDU (HTML Interface)

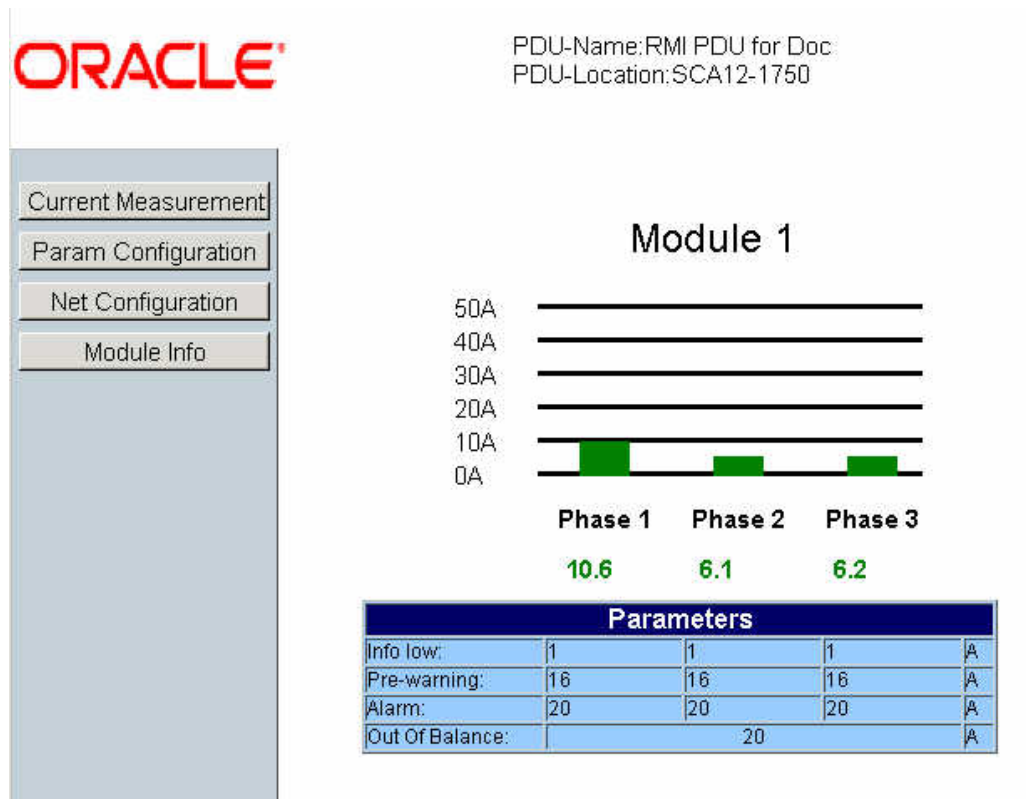
Using the metering unit's HTML interface, you can monitor the current being used by attached equipment. You can also see how these current readings relate to the threshold parameters you set in [“Set Threshold Parameter Levels \(Original PDU\)”](#) on page 67.

1. Access the PDU metering unit from a system on the network.

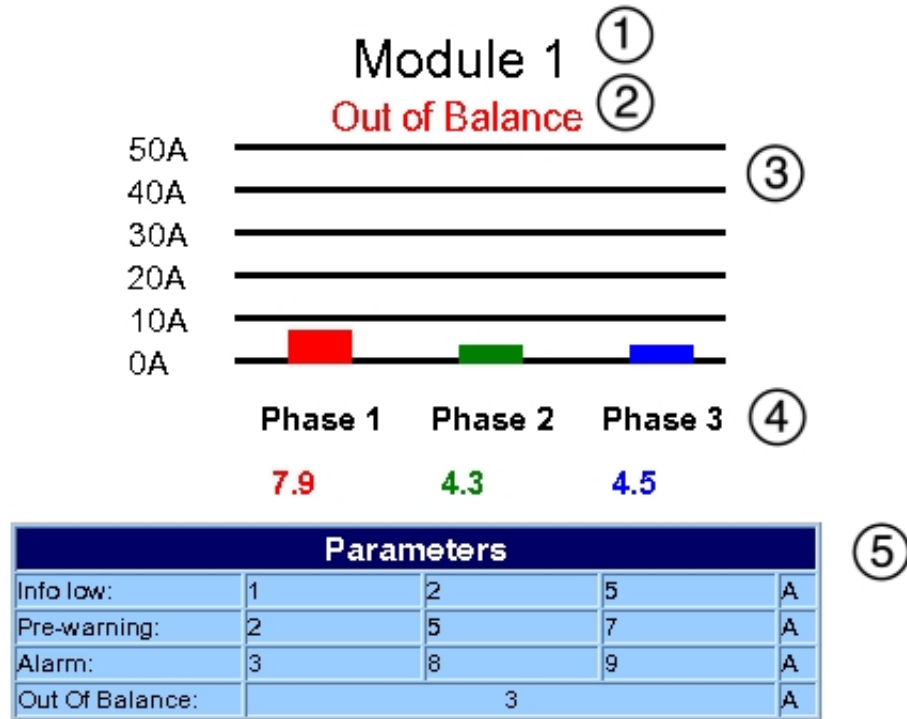
See [“Access a Metering Unit on the Network \(Original PDU\)”](#) on page 66. After accessing the PDU, the Current Measurement page displays.

2. View the Current Measurement page.

The following figure shows an example Current Measurement page for a 37 kVA PDU, which has three modules with three phases each. See [“Understanding the Relationship Between Modules and Outlet Groups”](#) on page 61 for a description of PDU modules.



The following figure displays the details of a single PDU module.



No.	Description
1	PDU Module number
2	Out of Balance alarm message
3	Graph displaying the amps of current being used per phase
4	Number of amps of current being used per phase
5	Table showing the threshold parameter settings

If you set threshold parameter values (see [“Set Threshold Parameter Levels \(Original PDU\)” on page 67](#)), the module graph and current amp number are displayed in different

colors, depending on how much current the attached equipment is using. See the following table for a description of these colors.

Note - If you do not set any threshold parameter values, all of the measurements are displayed in red.



Caution - If the PDU is out of balance, the PDU and the attached equipment might heat up and cause serious damage to the equipment, PDU, and the rack. Power off the equipment and the PDU immediately.

Current and Voltage Measurement Colors

If you set threshold parameter values for an original PDU (See [“Set Threshold Parameter Levels \(Original PDU\)”](#) on page 67), the module graph and current amp number are displayed in one of the colors in this table.

If you set values for an enhanced PDU (See [“Set Threshold Parameter Values \(Enhanced PDU\)”](#) on page 101), the color behind the black line is one of the colors in this table.

TABLE 12 Color Descriptions of PDU Module Measurements

Color	Value	Description
Blue	Measured current is below Info Low threshold.	Attached equipment is using less current than expected.
Green	Measured current is between the Info Low and Pre Warning thresholds.	Attached equipment is using the expected amount of current.
Yellow	Measured current is between the Pre Warning threshold, and the Alarm threshold.	Attached equipment is using more current than expected.
Red	Measured current is above the Alarm threshold.	Attached equipment is using a critical amount of current and requires immediate attention.
Blinking red	Measured current is above the Out of Balance threshold. Also, an blinking red “Out of Balance” message displays above the module graph.	The equipment attached to one phase is using more current than the other phases on the input. The PDU and attached equipment require immediate attention.
Color	Value	Description
Green	Measure of Voltage is above Warning threshold.	Attached equipment is operating with an expected voltage level.
Yellow	Measured Voltage is between Warning and Alarm threshold.	Attached equipment is operating at an allowable voltage level.

Color	Value	Description
Red	Measured Voltage is below Alarm threshold.	Attached equipment might not operate as expected.



Caution - If the PDU input voltage is below the Alarm level, the attached equipment (and PDU) might be damaged. Power off the equipment and PDU immediately.

Changing Interface Settings (Original PDU)

The HTML interface allows you to name a PDU, assign new users, and send system log messages to systems on the network.

- [“Set the PDU Name and Location \(Original PDU\)” on page 75](#)
- [“Add Users and Change Passwords \(Original PDU\)” on page 76](#)
- [“Send System Log Messages to Systems on the Network \(Original PDU\)” on page 77](#)

▼ Set the PDU Name and Location (Original PDU)

It is a good practice to name the PDU you are monitoring, especially if your network contains multiple racks and PDUs. Besides the name, you can set the location of the PDU as well. When set, the name and location are displayed on the top of each HTML page.

1. **Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Original PDU\)” on page 66](#).
2. **Click on the Net Configuration link and log in as an admin user.**
You are prompted to log in as an admin user. By default, both the admin user name and password is admin.
3. **Scroll down the page until you see the Module Name & Location fields.**
4. **Provide a name and a location for the PDU.**

A name and location cannot be more than 15 characters.

Module Name & Location

PDU - Name:

PDU - Location:

5. **Click the Submit button to set the PDU name and location.**
6. **Click your web browser Reload or Refresh button to view the updated PDU name and location.**

▼ Add Users and Change Passwords (Original PDU)

Including the admin user, you can set up to five PDU users. Admin users can view all pages, while the other users can only view the Current Measurement page and the Param Configuration page.

1. **Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Original PDU\)”](#) on page 66.
2. **Click on the Net Configuration link and log in as an admin user.**
You are prompted to log in as an admin user. By default, both the admin user name and password is admin.
3. **Scroll down the page until you see the Admin/User fields.**
4. **Type in up to five users into the Admin/User fields.**

Type in a name and password for each user, and designate the user an admin or a user. If you change the admin user name or password, write the name and password down and save it in a secure location.

Note - Use only letters and numbers in user names and passwords.

Admin/User

	Name	Password	User	Admin
1.	<input type="text" value="admin"/>	<input type="text" value="83k4lp0"/>	<input type="radio"/>	<input checked="" type="radio"/>
2.	<input type="text" value="root"/>	<input type="text" value="r00t"/>	<input type="radio"/>	<input checked="" type="radio"/>
3.	<input type="text" value="netadmin"/>	<input type="text" value="network090"/>	<input checked="" type="radio"/>	<input type="radio"/>
4.	<input type="text" value="guest"/>	<input type="text" value="guest"/>	<input checked="" type="radio"/>	<input type="radio"/>
5.	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input checked="" type="radio"/>

5. Click the Submit button to set the PDU users and passwords.

▼ Send System Log Messages to Systems on the Network (Original PDU)

In the following example, M1Ph1 12.3A means that there is a 12.3 amp current measurement on module 1, phase 1 of the PDU. A --.-A amp measurement means that the PDU module is not available (has nothing connected to it or does not exist).

For more information about syslog, refer to the Oracle Solaris documentation and the `syslogd(1M)` and `syslog.conf(4)` man pages.

You can set the PDU to send system log (syslog) messages to up to four systems on the network. syslog is the standard UNIX system logging utility, which monitors critical system events and configuration changes. These syslog messages are sent to the systems using user datagram protocol (UDP) port 514.

Here is an example PDU syslog message:

```
PDU-Values: M1Ph1 12.3A M1Ph2 12.1A M1Ph3 12.2A M2Ph1 0.0A  
M2Ph2 0.0A M2Ph3 0.0A M3Ph1 --.-A M3Ph2 --.-A M3Ph3 --.-A
```

- 1. Access the PDU metering unit from a system on the network.**

See [“Access a Metering Unit on the Network \(Original PDU\)”](#) on page 66.

- 2. Click on the Net Configuration link and log in as an admin user.**

You are prompted to log in as an admin user. By default, both the admin user name and password is admin.

3. Scroll down the page until you see the Syslog heading.

Syslog

Syslog enable	<input checked="" type="checkbox"/>
	<input type="button" value="Submit"/> <input type="button" value="Reset"/>
Host	IP
1.	<input type="text" value="192.0.2.12"/>
2.	<input type="text" value="198.51.100.20"/>
3.	<input type="text" value="0.0.0.0"/>
4.	<input type="text" value="0.0.0.0"/>
	<input type="button" value="Submit"/> <input type="button" value="Reset"/>
Time:	
hour(s):	<input type="text" value="0"/>
minute(s):	<input type="text" value="0"/>
second(s):	<input type="text" value="10"/>
Alarms	<input checked="" type="checkbox"/>
	<input type="button" value="Submit"/> <input type="button" value="Reset"/>

4. **Click the Syslog Enable checkbox to enable the syslog message logging, then click the Submit button.**
5. **Type in up to four IP addresses of systems you want the metering unit to send syslog messages, then click the Submit button below the IP addresses.**
6. **Set the time duration between sending syslog messages.**

Valid time settings include:

- **Hours: 0 - 23**
- **Minutes: 0 - 59**
- **Seconds: 0 - 59**

For example:

- If you set the duration for 12 hours, the PDU sends syslog messages every 12 hours.
- If you set hours to 2 and minutes to 27, the PDU sends syslog messages every 2 hours and 27 minutes.

7. **Click the Alarms checkbox to send alarm messages over syslog messages.**

If checked, and if you set threshold parameter values (see [“Set Threshold Parameter Levels \(Original PDU\)” on page 67](#)), the metering unit sends alarm messages when threshold parameter values are reached.

Possible syslog alarm messages include:

- **Dead-Trap**
A Dead-Trap message is sent after a PDU power cycle (power is removed and reapplied).
- **InfoLow-Trap ON ModuleNum/PhaseNum**
- **PreWarningHigh-Trap ON ModuleNum/PhaseNum**
- **AlarmHigh-Trap ON ModuleNum/PhaseNum**
- **ReturnToNormal-Trap ON ModuleNum/PhaseNum**
- **OutOfBalance-Trap for ModuleNum**

ModuleNum/PhaseNum corresponds to the PDU's module number and phase number.

The following log entries show the differences between a reset and a power fail:

```
0000-00-00 00:00:00 System: PDU-StartUp after PowerFail
0000-00-00 00:00:00 System: PDU-StartUp
```

8. Click the **Submit** button to enable these settings.

Enabling and Configuring SNMP (Original PDU)

The PDU metering unit supports Simple Network Management Protocol (SNMP). SNMP provides the ability to send traps, or notifications, when one or more conditions have been met. If you enable SNMP, the metering unit can send and receive traps to and from SNMP agents on the network.



Caution - Do not place more than three get commands in a single SNMP request. Additional get commands might cause the PDU to experience a network hang.

Note - These sections do not describe how to view SNMP trap information using an SNMP agent. Refer to your SNMP agent documentation for details on how to use it to view SNMP-based information.

- [“Types of PDU Metering Unit SNMP Traps \(Original PDU\)” on page 81](#)
- [“Enable and Configure SNMP \(Original PDU\)” on page 82](#)
- [“Specify NMS Hosts \(Original PDU\)” on page 85](#)

Types of PDU Metering Unit SNMP Traps (Original PDU)

The following table describes the SNMPv2 traps the metering unit can send to SNMP agents on the network (over UDP port 162). In the trap descriptions, *ModuleNum/PhaseNum* corresponds to the module number and phase number of the PDU (for example, Module1/Phase2).

SNMP Trap	SNMP Notification	Description
Keep alive	KeepAlive-Trap	The PDU sends a KeepAlive-Trap message to the SNMP host to ensure that the link between them is operational.

SNMP Trap	SNMP Notification	Description
Dead	Dead-Trap	Sent after a PDU power cycle.
Info low	InfoLow-Trap on <i>ModuleNum/PhaseNum</i>	Attached equipment is using less current than expected.
PreWarning high	PreWarningHigh-Trap on <i>ModuleNum/PhaseNum</i>	Attached equipment is using more current than expected.
Alarm high	AlarmHigh-Trap on <i>ModuleNum/PhaseNum</i>	Attached equipment is using a critical amount of current and requires immediate attention.
Return to normal	ReturnToNormal-Trap on <i>ModuleNum/PhaseNum</i>	After sending an alarm trap, the attached equipment has returned to using the expected amount of current.
Out of balance	OutOfBalance-Trap on <i>ModuleNum/PhaseNum</i>	The equipment attached to one phase is using more current than the other phases on the module. The PDU and attached equipment require immediate attention.

▼ Enable and Configure SNMP (Original PDU)

Use the HTML interface to enable SNMP, specify SNMP community hosts, and set repeating SNMP trap durations.

- 1. Access the PDU metering unit from a system on the network.**

See [“Access a Metering Unit on the Network \(Original PDU\)” on page 66](#).

- 2. Click on the Net Configuration link and log in as an admin user.**

You are prompted to log in as an admin user. By default, both the admin user name and password is admin.

3. **Scroll down the page until you see the SNMP heading.**

HTTP

HTTP enable

Submit

Reset

SNMP

SNMP enable

Submit

Reset

4. **Click the SNMP Enable checkbox to enable SNMP.**

If desired, you can disable HTTP access to the PDU by deselecting the HTTP enable checkbox located just above the SNMP heading.



Caution - If you disable HTTP, you are no longer be able to log in to the HTML interface using a web browser. To re-enable HTTP access, you must use your SNMP agent software. Refer to your SNMP agent documentation or the Solaris `snmpset(1M)` man page for more information.

5. **Under the Trap Host Setup heading, define up to 10 SNMP hosts.**

Once configured, the metering unit sends SNMP traps to these hosts. For each host, type in the IP address and the SNMP community name. An SNMP community name identifies which SNMP group the host belongs.

Trap Host Setup		
Host	IP	Community
1.	<input type="text" value="192.0.2.12"/>	<input type="text" value="public"/>
2.	<input type="text" value="198.51.100.16"/>	<input type="text" value="public"/>
3.	<input type="text" value="203.0.113.10"/>	<input type="text" value="public"/>
4.	<input type="text" value="0.0.0.0"/>	<input type="text"/>
5.	<input type="text" value="0.0.0.0"/>	<input type="text"/>
6.	<input type="text" value="0.0.0.0"/>	<input type="text"/>
7.	<input type="text" value="0.0.0.0"/>	<input type="text"/>
8.	<input type="text" value="0.0.0.0"/>	<input type="text"/>
9.	<input type="text" value="0.0.0.0"/>	<input type="text"/>
10.	<input type="text" value="0.0.0.0"/>	<input type="text"/>

6. Provide values to the repeating trap settings.

Here is a description of these repeating trap settings.

Setting	Description	Permitted Values
KeepAlive Trap	The number of seconds between repeating the KeepAlive trap.	0 - 60
Repeating Time for Traps	The number of seconds between sending trap messages to SNMP hosts.	0 - 60
Number of traps	The number of times the same trap can repeated to the same host.	0 -255

7. **Click the Submit button to enable these SNMP settings.**

▼ Specify NMS Hosts (Original PDU)

A network management station (NMS) host runs network management applications that monitor and control SNMP managed devices. NMS hosts provide the resources required for network management.

You can specify up to four NMS hosts on the network.

1. **Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Original PDU\)”](#) on page 66.
2. **Click on the Net Configuration link and log in as an admin user.**
You are prompted to log in as an admin user. By default, both the admin user name and password is admin.

3. **Scroll down the page until you see the NMS heading.**

NMS

Host	IP	Community
1.	<input type="text" value="192.0.2.12"/>	<input type="text" value="public"/>
2.	<input type="text" value="198.51.100.22"/>	<input type="text" value="public"/>
3.	<input type="text" value="198.51.100.8"/>	<input type="text" value="public"/>
4.	<input type="text" value="203.0.113.18"/>	<input type="text" value="public"/>

4. **Specify up to four NMS hosts.**
For each NMS host, type the IP address and the SNMP community name. An SNMP community name identifies which SNMP group the host belongs.
5. **Click the Submit button to enable these NMS settings.**

Verifying and Updating the Firmware (Original PDU)

The PDU metering module contains firmware that operates the LCD screen and provides the HTML interface. This firmware might be updated in the future to correct issues and provide new functionality.

- [“View Module Information \(Original PDU\)” on page 87](#)
- [“Update the PDU Metering Unit Firmware \(Original PDU\)” on page 88](#)

▼ View Module Information (Original PDU)

Before downloading any new firmware, confirm the firmware revision level currently running on the PDU metering unit.

1. **Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Original PDU\)”](#) on page 66.
2. **Click on the Module Info link to verify the firmware revision level, as well as other information, on the Module Info page.**

Module Info

- ① Mac-Address: 00.0B.38.BC.00.00
- ② Firmware Ver.: 1.0
- ③ Bootloader Ver.: 1.0
- ④ PDU-Serial Number:
- ⑤ PDU-Partnumber:
- ⑥ Date of Manufacture (MM-DD-JJJJ):

No.	Description
1	MAC address of the PDU metering unit
2	Currently installed firmware version
3	Currently installed bootloader version
4	PDU serial number
5	PDU part number
6	Date of the PDU manufacture (MM-DD-YYYY)

▼ Update the PDU Metering Unit Firmware (Original PDU)

You can download updates of the PDU metering unit firmware from the Downloads web site.



Caution - When updating the firmware, you must update both the metering unit firmware and the HTML interface pages. Failure to update the HTML pages causes certain pages of the interface not to display, which renders the web interface unusable.

Note -Updating the firmware does not overwrite any configurations you set previously.

- 1. Using a web browser, connect to the Downloads web site:**
<https://myoraclesupport.com>
- 2. Locate and download the latest version of the firmware.**
To locate the latest PDU firmware, search the Download Center for the *Oracle Rack 1242*. Follow the instructions on the web site to download the firmware.
- 3. Save the downloaded firmware ZIP file to a directory accessible to the PDU over the network.**
If the download is not in a ZIP file, make sure you download both the metering unit firmware (MKAPP_vx.x.dl) and the HTML interface files (HTML_vx.x.dl).
- 4. Use the unzip command to extract the metering unit firmware from the downloaded ZIP file.**
The downloaded ZIP file contains two update files:
 - **MKAPP_vx.x.dl – metering unit firmware**
 - **HTML_vx.x.dl – HTML interface files**If the ZIP file also contains a text file, review it for any additional information about the firmware updates.
- 5. Access the PDU metering unit from a system on the network.**
See “[Access a Metering Unit on the Network \(Original PDU\)](#)” on page 66.
- 6. Click on the Net Configuration link and log in as an admin user.**
You are prompted to log in as an admin user. By default, both the admin user name and password is admin.

7. **Scroll down the page until you see the Firmware-Update heading.**

Firmware-Update



The image shows a web interface for updating firmware. It features a text input field on the left, a 'Browse...' button in the middle, and a 'Submit' button on the right. The buttons are light gray with black text.

8. **Click on the Browse button and locate the MKAPP_Vx.x.dl file you downloaded previously.**
9. **Click the Submit button to update the metering unit firmware.**
After updating the firmware, you are prompted to update the HTML interface.
10. **Click on the Browse button again, log in as an admin user, and locate the HTML_Vx.x.dl file you downloaded previously.**
11. **Click the Submit button update the metering unit firmware.**
12. **Confirm that you updated the firmware and HTML interface successfully.**
See [“View Module Information \(Original PDU\)” on page 87](#) for instructions on viewing the firmware revision level.

Administering the PDU Metering Unit (Original PDU)

Besides monitoring the current of connect equipment, you can reset the PDU, view information about the network connection and firmware revisions, and adjust the LCD screen.

- [“Reset the PDU Metering Unit \(Original PDU\)” on page 89](#)
- [“View Status Information on the LCD Screen \(Original PDU\)” on page 90](#)
- [“Adjust the LCD Screen \(Original PDU\)” on page 91](#)

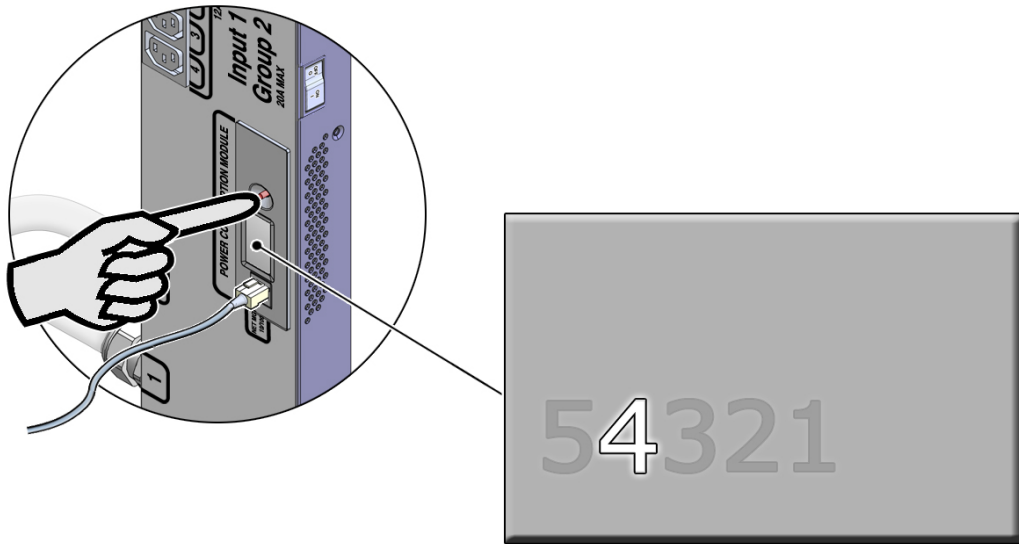
▼ **Reset the PDU Metering Unit (Original PDU)**

You can reset the PDU metering unit using the reset button.

Note - Resetting the metering unit does not power cycle equipment attached to the PDU.

1. **Press and hold the reset button until you see a five-second countdown displayed on the LCD screen.**

You must press the reset button for 20 seconds before the five-second countdown begins.



2. **During the five-second countdown, release the reset button and then tap the button again to force the metering unit to reset.**

▼ View Status Information on the LCD Screen (Original PDU)

When the PDU metering unit resets or powers on, you can view network and firmware version level information on the LCD screen.

1. **Reset the PDU metering unit.**

See [“Reset the PDU Metering Unit \(Original PDU\)”](#) on page 89 for instructions.

2. After the metering unit resets, the LCD screen displays information about the unit.

The screen displays the following information:

```
HW: x.x      FW:x.x
DHCP: OFF (or ON)
MAC: xx-xx-xx-xx-xx-xx
IP: xxx.xxx.xxx.xxx
HTML: VALID
```

The following table describes the LCD screen information.

LCD Text	Description
HW	Version of the PDU hardware.
FW	Version of the PDU firmware.
DHCP	Displays ON, when DHCP is enabled, and OFF when DHCP is disabled. See “Connect an Original PDU to a DHCP Network” on page 42 for more information about DHCP.
MAC	MAC address of the metering unit.
IP	IP address of the metering unit. <ul style="list-style-type: none"> ■ If DHCP is OFF, the IP address is an internally stored static address. ■ If DHCP is ON, the IP address is set by the DHCP server.
HTML	Displays VALID when the correct version of the HTML pages is installed, INVALID when not.

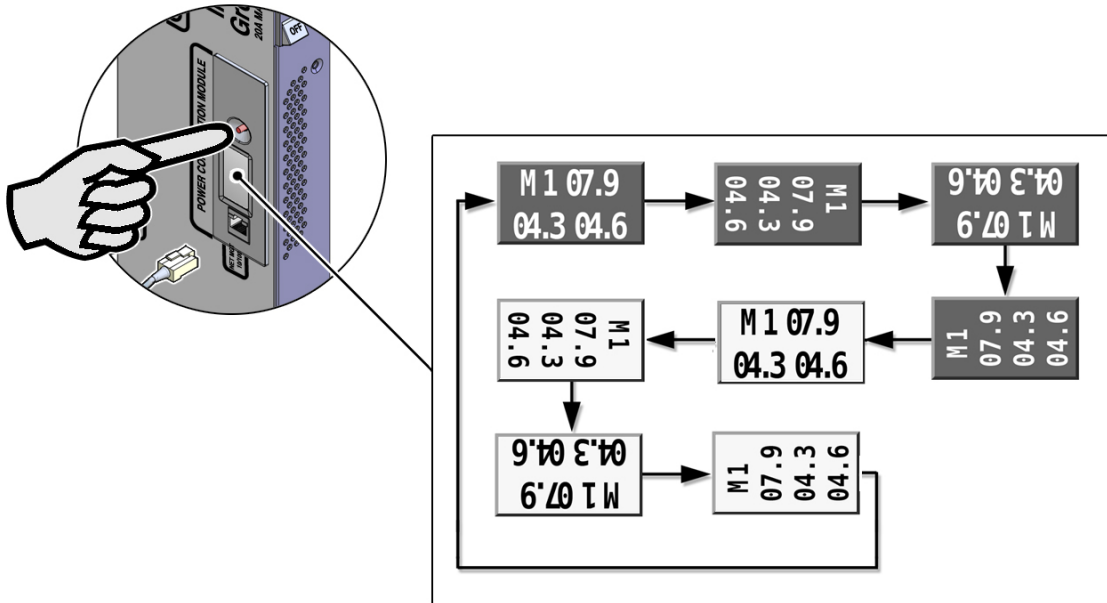
▼ Adjust the LCD Screen (Original PDU)

You can adjust the LCD screen orientation and background to help you view the screen within the rack.

● Press and hold the reset button until the LCD screen rotates 90 degrees??.

Continue to press and release the reset button to cycle through different LCD screen orientations. The first four screens have white text on a black background, while the other four

have black text on a white background. The final selected screen becomes the new default orientation.



▼ Restore the PDU to Factory Default Settings (Original PDU)

If you need to correct a configuration error, or you want to clear the PDU before moving it to a different rack, you can restore the PDU metering unit back to its factory settings.

After restoring the unit, all network and configuration settings reset back to their default values (for example, admin is the only user and the IP address returns to the default value). All settings that you set for your environment are lost.

Note - After restoring the PDU metering unit back to its factory settings, you must reconnect it to the network. See [“Connecting PDUs to the Network”](#) on page 41 for instructions.

1. **Log in to the PDU metering unit.**

- See [“Access a Metering Unit on the Network \(Original PDU\)”](#) on page 66.
- 2. **Click on the Net Configuration link and log in as an admin user.**
See [“Login Information”](#) on page 60.
- 3. **Scroll down the page until you see the Factory-Reset heading.**

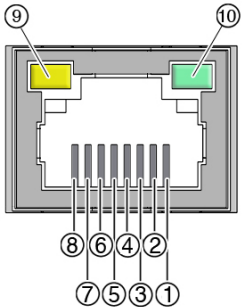
Factory-Reset

set module to factory settings

Submit

- 4. **Click the Submit button to restore the PDU metering unit back to its default factory settings.**

NET MGT Port LED and Pin Descriptions



Pin	Signal Description	Pin	Signal Description
1	Transmit+ (TX+)	6	Receive- (RX-)

NET MGT Port LED and Pin Descriptions

Pin	Signal Description	Pin	Signal Description
2	Transmit- (TX-)	7	Not used
3	Receive+ (RX+)	8	Not used
4	Not used	9	Activity LED – flashes when network data is being transmitted through the port
5	Not used	10	Link LED – lights when the unit is connected to a network

Monitoring Enhanced PDUs

For enhanced PDUs, there are four ways you can monitor how much power, energy, and current the equipment attached to the PDU uses, as well as the voltage level powering the equipment. You also can configure the metering unit to send messages to systems on the network.

The following table lists the tasks necessary to configure and use the PDU metering unit.

Description	Links
Understand the relationship between the metering unit interface and the PDU outlet groups.	“Understanding the Relationship Between Inputs and Outlet Groups” on page 95
Access the metering unit from a system on the network.	“Access a Metering Unit on the Network (Enhanced PDU)” on page 100
Set the voltage and current threshold values.	“Set Threshold Parameter Values (Enhanced PDU)” on page 101
Monitor the power, energy, current, and voltage levels.	“Monitoring an Enhanced PDU” on page 104
	“Understanding CLI Commands” on page 135
Change the metering unit interface settings.	“Changing Interface Settings (Enhanced PDU)” on page 110
Enable and configure SNMP settings.	“Enabling and Configuring SNMP (Enhanced PDU)” on page 114
View the metering unit firmware version and update the firmware.	“Verifying and Updating the Firmware (Enhanced PDU)” on page 120
Use the PDU metering unit’s LCD screen.	“Administering the PDU Metering Unit (Enhanced PDU)” on page 123
Set the PDU time.	“Set the PDU System Time” on page 128
Check the PDU event logging page.	“Access the Event Logging Page” on page 130
Restore the PDU metering unit’s settings back to the factory default settings.	“Restoring the PDU to Factory Default Settings (Enhanced PDU)” on page 130

Understanding the Relationship Between Inputs and Outlet Groups

These topics describe the relationship between inputs and outlet groups.

- [“Relationship Between Inputs and Outlet Groups Overview” on page 96](#)
- [“Single-Phase PDU Input and Outlet Group Relationship” on page 97](#)
- [“Three-Phase PDU Input and Outlet Group Relationship” on page 99](#)

Relationship Between Inputs and Outlet Groups Overview

The metering unit monitors inputs, which are collections of PDU power outlet groups. Depending on the PDU, an input might contain all of the outlet groups on the PDU, or a subset of the groups. The metering unit monitors the current, voltage, power, apparent power, and energy flowing through each input, not through each outlet group.

A metering unit input might also be divided into phases, which can either correspond to each power input lead in single-phase PDUs, or the separate phases in three-phase PDUs.

[“Single-Phase PDU Input and Outlet Group Relationship” on page 97](#) and [“Three-Phase PDU Input and Outlet Group Relationship” on page 99](#) show how the metering unit divides the outlet groups into inputs and phases.

These topics also help you understand the metering unit's web interface, SNMP messages, system log messages, and LCD screen. For example, if your rack contains a high-voltage 37 kVA PDU and the PDU's LCD screen shows that L2 of IN2 is using excessive current, the equipment connected to outlet group 7 needs attention.

Note - Refer to the labels on the PDUs to see the locations of these outlet groups.

Single-Phase PDU Input and Outlet Group Relationship

FIGURE 4 Single-Phase PDU Input and Outlet Group Relationship

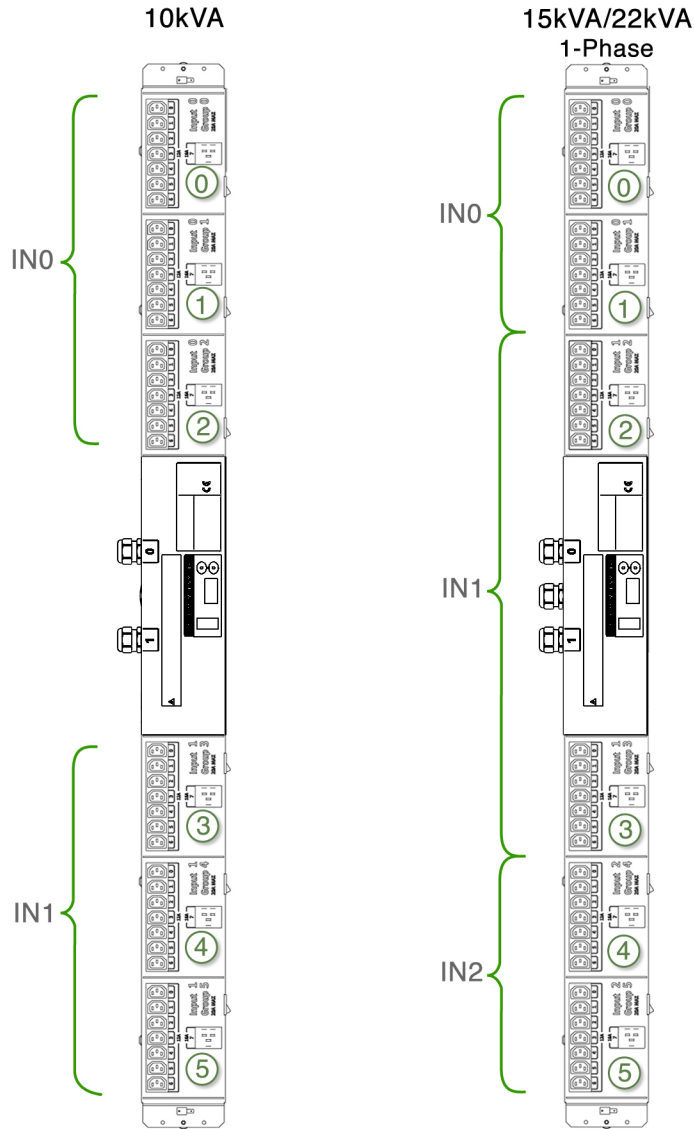
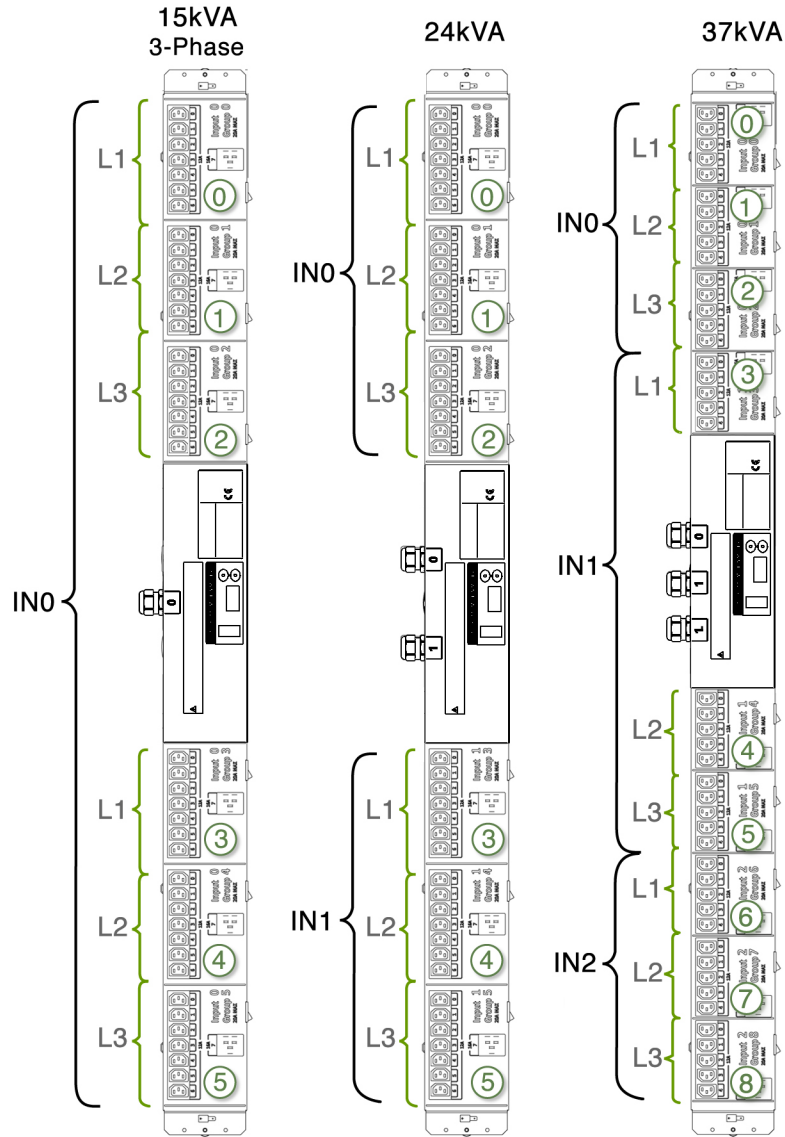


TABLE 13 Metering Unit Inputs and Outlet Groups on Single-Phase PDUs

PDU Type	Power Input Lead Number	Outlet Group
10 kVA	0	0, 1, 2
10 kVA	1	3, 4, 5
15 kVA, 22 kVA	0	0, 1
15 kVA, 22 kVA	1	2, 3
15 kVA, 22 kVA	2	4, 5

Three-Phase PDU Input and Outlet Group Relationship

FIGURE 5 Three-Phase PDU Input and Outlet Group Relationship



Note - For three-phase, low-voltage PDUs, each metering unit phase reports current from two outlet groups. Input phase 1 reports a combination of current from outlet groups 0 and 2 (3 and 5, or 6 and 8, depending on which input). Input phase 2 reports a combination of current from outlet groups 1 and 0 (4 and 3, or 7 and 6, depending on which input). Input phase 3 reports a combination of current from outlet groups 2 and 1 (5 and 4, or 8 and 7, depending on which input).

TABLE 14 Relationship Between Metering Unit Inputs and Outlet Groups on Three-Phase PDUs

PDU Type	Power Input Lead Number	Input Phase	Outlet Group
15 kVA	0	Phase 1	0, 3
15 kVA	0	Phase 2	1, 4
15 kVA	0	Phase 3	2, 5
24 kVA	0	Phase 1	0
24 kVA	0	Phase 2	1
24 kVA	0	Phase 3	2
24 kVA	1	Phase 1	3
24 kVA	1	Phase 2	4
24 kVA	1	Phase 3	5

▼ Access a Metering Unit on the Network (Enhanced PDU)

After you connect the PDU metering unit to the network, you can use a web browser to access the metering unit from any system on the network.

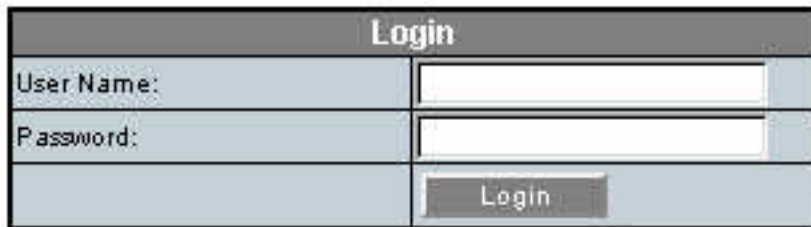
Note - HTTPS is the default setting.

1. **Determine the IP address of the PDU metering unit.**
 - a. **Use the static IP address you configured the metering unit to use.**
 - b. **Press the Select Input button until the PDU information appears.**
 - c. **Ask your network administrator for the IP address assigned by the DHCP server. Refer to the DHCP server's documentation for instructions on listing devices connected to the DHCP network.**

2. **On a system connected to the network, type the metering unit IP address in a web browser's address line to connect to the PDU metering unit.**

Once connected, the browser displays the Metering Overview page.

Note -All users can view the Metering Overview and Module Info pages. If you attempt to view another page, you are prompted to log in.



Login	
User Name:	<input type="text"/>
Password:	<input type="password"/>
	<input type="button" value="Login"/>

3. **When prompted, log in as an admin or a user.**

See [“Login Information” on page 60](#).

Note - You are automatically logged out after 10 minutes of inactivity. You can also log out by clicking on the Logout button.

▼ Set Threshold Parameter Values (Enhanced PDU)

The Metering Overview page displays the power information for each PDU input, as well as a graphical measurement of the values. After you set current threshold parameter levels, the page shows the graphical measurements in different colors, depending on how you set the threshold levels. See [“Monitor the Enhanced PDU \(HTML Interface\)” on page 105](#) for more information.

Note - Screenshots with the reset functionality are from FW version 2.01. The reset functionality is not available beginning with FW version 2.02.

1. **Access the PDU metering unit from a system on the network.**

See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100.

2. Click on the Parameter link and log in as either an admin or user.

See [“Login Information”](#) on page 60.

The Parameter page displays and identifies the PDU inputs and phases. Depending on your PDU, you might have one or more inputs with one or more phases per input. See [“Understanding the Relationship Between Inputs and Outlet Groups”](#) on page 95 for a description of PDU inputs.

Metering Overview

Parameter

Net Configuration

Module Info

Admin logged in!

Logout

PDU

Energy	
Clear Energy for PDU	Clear

Input 0

Energy	
Clear Energy for Input	Clear

Phase	Parameter Current			Parameter Voltage		Trap Enable
	Info	Warning	Alarm	Warning	Alarm	
1	0.0 A	47.3 A	50.4 A	253.0 V	253.0 V	<input type="checkbox"/>
2	0.0 A	47.3 A	50.4 A	253.0 V	253.0 V	<input type="checkbox"/>
3	0.0 A	47.3 A	50.4 A	253.0 V	253.0 V	<input type="checkbox"/>

Out of Balance	
53.5 A	<input type="checkbox"/>
Submit	

Input 1

Energy	
Clear Energy for Input	Clear

Phase	Parameter Current			Parameter Voltage		Trap Enable
	Info	Warning	Alarm	Warning	Alarm	
1	0.0 A	47.2 A	66.0 A	253.0 V	253.0 V	<input type="checkbox"/>
2	0.0 A	47.2 A	3.3 A	253.0 V	253.0 V	<input checked="" type="checkbox"/>
3	0.0 A	47.2 A	61.9 A	253.0 V	253.0 V	<input checked="" type="checkbox"/>

Out of Balance	
50.0 A	<input checked="" type="checkbox"/>
Submit	

Note - The Clear Energy for the Input and PDU option allows you to reset Energy to zero to begin monitoring from “0”.

3. For each input, type in current levels for each threshold parameter.

a. For each phase of the input, set the following parameters (in amps):

- **Info** – A value when the attached equipment is using less current than expected.
- **Warning** – A value when the attached equipment is using more current than expected.
- **Alarm** – A value when the equipment is using a critical amount of current and requires immediate attention

b. Set the Out of Balance current level for the entire input.

A PDU can become out of balance if one phase uses more current than the others. Set the out of balance parameter to the number of amps that one phase cannot use more than any other in the input. For example, if you set this parameter to 5, and phase 1 uses 12 amps of current and phase 3 uses 4 amps, the Metering Overview displays an out of balance error message.

Note - If the PDU input contains only one phase, the Out of Balance parameter is not available.

c. For each phase of the input, set the following parameters (in volts).

- **Warning** – the minimal nominal operating voltage.
- **Alarm** – the minimal allowable operating voltage.

d. (Optional) If you have enabled SNMP control for the PDU, you can enable SNMP control for each PDU input.

If you enable SNMP on the Net Configuration page, you enable SNMP for all inputs in the PDU. However, you can disable or enable SNMP control of each PDU input from this page. See [“Enable and Configure SNMP \(Enhanced PDU\)” on page 116](#) for more information about SNMP settings.

e. Click the Submit button to set these threshold parameter values for the input.

- For FW version 2.01, the Reset button is available to reset all values.
- Beginning with FW version 2.02, the Reset button is not available.

4. Repeat [Step 3](#) for each PDU input.

Monitoring an Enhanced PDU

There are four ways you can monitor how much power, energy and current the equipment attached to the PDU uses, as well as the voltage level powering the equipment, the PDU's LCD screen, the Monitoring Overview page using HTML interface, the RS-232 interface, or the SSH interface.

Note - To provide better security, CLI access via telnet interface is not supported.

- [“Monitor the Enhanced PDU \(LCD Screen\)” on page 104](#)
- [“Monitor the Enhanced PDU \(HTML Interface\)” on page 105](#)
- [“Monitor the Enhanced PDU \(RS-232\)” on page 109](#)
- [“Monitor the Enhanced PDU \(SSH\)” on page 109](#)

▼ Monitor the Enhanced PDU (LCD Screen)

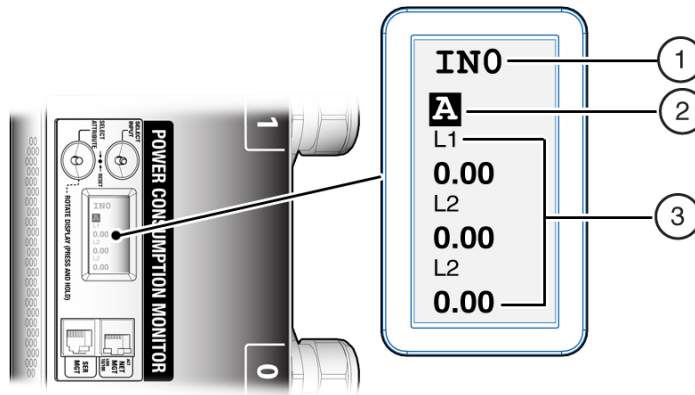
Using the metering unit's LCD screen, you can monitor how much power and current the equipment attached to the PDU uses, as well as the voltage level powering the equipment.

- 1. Locate the PDU you want to monitor in the rack.**
You might need to open the rack's rear door to access the PDU.
- 2. Locate the metering unit on the PDU.**
You can find the metering unit in the middle of the PDU.
- 3. Check the metering unit's LCD screen to view the current, voltage, and power being used by the equipment connected to each PDU input.**

The LCD screen displays the current measurements of all of the phases of each PDU input. See [“Understanding the Relationship Between Inputs and Outlet Groups” on page 95](#) for a description of PDU inputs.

- **Press the Select Attribute button to select the parameter displayed.**
- **If your PDU has more than one input, press the Select Input button to cycle through the available inputs.**

- For easier viewing, you can rotate the screen in 90-degree intervals by pressing the Select Attribute button for longer than 1 second. See [“Adjust the LCD Screen \(Enhanced PDU\)”](#) on page 128 for more information.



No.	Description
1	Input number
2	Attribute current, voltage or power
3	Measured value being used by the equipment connected to the PDU phase

▼ Monitor the Enhanced PDU (HTML Interface)

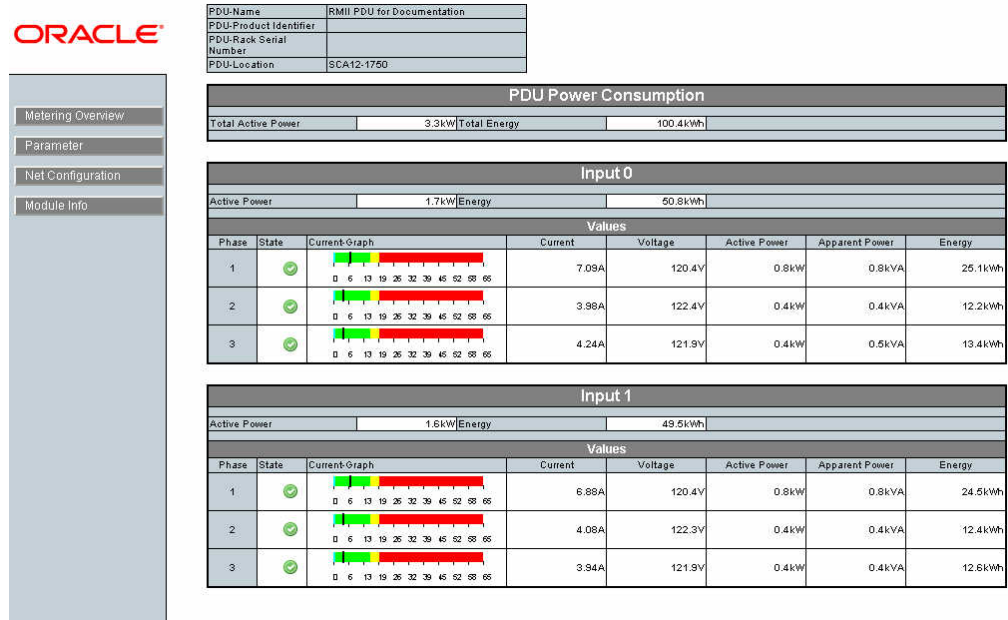
Using the metering unit's HTML interface, you can monitor how much power, energy, and current the equipment attached to the PDU uses, as well as the voltage level powering the equipment. The reported voltage for 3ph PDUs is L-N for HV PDUs and L-G for LV PDUs. The reported voltage for 1ph PDUs is L-N for HV PDUs and L-L for LV PDUs. You can see how the current and voltage readings relate to the threshold parameters you set in [“Set Threshold Parameter Values \(Enhanced PDU\)”](#) on page 101.

1. Access the PDU metering unit from a system on the network.

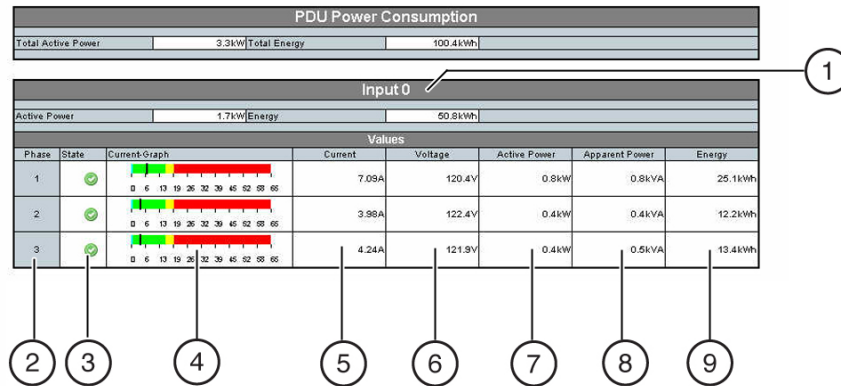
See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100. After accessing the PDU, the Metering Overview page displays.

2. View the Metering Overview page.

The following figure shows an example Metering Overview page for a 24kVA PDU, which has two inputs with three phases each. See “Understanding the Relationship Between Inputs and Outlet Groups” on page 95 for a description of PDU inputs.



The following figure displays the details of the current measurement of an example single PDU input.



No.	Description
1	PDU input number
2	Phase number
3	State
4	Graph displaying the amps of current being used per phase
5	Number of amps of current being used per phase
6	Voltage level applied per phase [†]
7	Amount of active power being used per phase
8	Amount of apparent power being used per phase
9	Energy level being used per phase

[†]The reported voltage for 3ph PDUs is L-N for HV PDUs and L-G for LV PDUs. The reported voltage for 1ph PDUs is L-N for HV PDUs and L-L for LV PDUs.

The black vertical bar indicates the current used by the attached equipment. The color behind the line is determined by the threshold parameter values. If you set voltage threshold parameter values, the background of the voltage color indicates the state of the voltage powering the equipment. For more information on threshold limits, see [“Set Threshold Parameter Values \(Enhanced PDU\)”](#) on page 101.

Note - The Enhanced PDU supports both, 10/100 Full Duplex and 10/100 Half Duplex as well as auto-negotiation as defined in IEEE802.3u. If the switch port supports auto-negotiation the Enhanced PDU will configure itself to the fastest speed supported by the switch. If a specific mode of operation is needed the switch port needs to be configured to the specific mode of operation.

Color	Value	Description
Blue	Measured current is below Info threshold.	Attached equipment is using less current than expected.
Green	Measured current is between the Info and Warning thresholds.	Attached equipment is using the expected amount of current.
Yellow	Measured current is above the Warning threshold, but below the Alarm threshold.	Attached equipment is using more current than expected.
Red	Measured current is above the Alarm threshold.	Attached equipment is using a critical amount of current and requires immediate attention.
Flashing bar with red text	Measured current is above the Out of Balance threshold. Also, a blinking red "Out of Balance" message displays above the input graph.	The equipment attached to one phase is using more current than the other phases on the input. The PDU and attached equipment require immediate attention.



Caution - If the PDU is out of balance, the PDU and the attached equipment might heat up and cause serious damage to the equipment, PDU, and the rack. Power off the equipment and the PDU immediately.

If you set voltage thresholds parameter values, the background of the voltage color indicates the state of the voltage powering the equipment. See the following table for a description of these colors.

Color	Value	Description
Green	Measured Voltage is above Warning threshold.	Attached equipment is operating with an expected voltage level.
Yellow	Measured Voltage is between Warning and Alarm threshold.	Attached equipment is operating at an allowable voltage level.
Red	Measured Voltage is below Alarm threshold.	Attached equipment might not operate as expected.



Caution - If the PDU input voltage is below the Alarm level, the attached equipment (and PDU) might be damaged. Power off the equipment and PDU immediately.

▼ Monitor the Enhanced PDU (RS-232)

Using the metering unit's RS-232, you can monitor how much power, energy, and current the equipment attached to the PDU uses, as well as the voltage level powering the equipment.

1. **Connect an RS-232 cable between the SER MGT port and the host.**
2. **Configure the host's terminal or terminal emulator with settings.**
See [“Terminal Configuration Settings” on page 60](#).
3. **When prompted, log in as an admin or user.**
See [“Login Information” on page 60](#).
4. **Familiarize yourself with the command options.**
See [“Understanding CLI Commands” on page 135](#).

▼ Monitor the Enhanced PDU (SSH)

Using the metering unit's SSH interface, you can monitor the power, energy, and current being used by equipment attached to the PDU and voltage powering the equipment.

1. **Connect an Ethernet cable between the NET MGT and the host.**
2. **Configure the SSH application with the PDU IP address.**
3. **When prompted, log in as an admin or user.**
See [“Login Information” on page 60](#).
4. **Familiarize yourself with CLI command options.**
See [“Understanding CLI Commands” on page 135](#).

Changing Interface Settings (Enhanced PDU)

The HTML interface allows you to name a PDU, assign new users, and send system log messages to systems on the network.

Note - Screenshots with the reset functionality are from FW version 2.01. The reset functionality is not available beginning with FW version 2.02.

- [“Set the PDU Information \(Enhanced PDU\)” on page 110](#)
- [“Add Users and Change Passwords \(Enhanced PDU\)” on page 111](#)
- [“Send System Log Messages to Systems on the Network \(Enhanced PDU\)” on page 112](#)

▼ Set the PDU Information (Enhanced PDU)

It is a good practice to name the PDU you are monitoring, especially if your network contains multiple racks and PDUs. Besides the name, you can set the location of the PDU, Product Identification, and serial number of the rack in which the PDU is installed. When set, the name and location are displayed on the top of each HTML page.

- 1. Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Enhanced PDU\)” on page 100](#).
- 2. Click on the Net Configuration link and log in as an admin user.**
See [“Login Information” on page 60](#).
- 3. Select the PDU Information tab.**
- 4. Provide a name, product identifier, rack serial number, and location for the PDU.**
The setting cannot exceed the following number of characters:

Setting	Characters
Name	32 maximum
Product identifier	40 maximum
Rack serial number	18 maximum

Setting	Characters
Location	32 maximum

IP-Settings	PDU-Information	HTTP-Access	SNMP-Access	SNMP-Traps	Syslog	SystemTime	EventLogging	Firmware Update	StartUp / Reset
PDU Information									
Name	D. Spinella PDU								
Product Identifier	12345								
Rack Serial Number	999999								
Location	West Coast, Rack 4								
<input type="button" value="Submit"/>									

5. Click the **Submit** button to set the PDU name and location.
6. Click your web browser **Reload** or **Refresh** button to view the updated PDU name and location.

▼ Add Users and Change Passwords (Enhanced PDU)

You can set up to five PDU users, including the admin user.

See [“Login Information” on page 60](#).

1. **Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Enhanced PDU\)” on page 100](#).
2. **Click on the Net Configuration link and log in as admin.**
See [“Login Information” on page 60](#).
3. **Select the HTTP-Access tab.**
4. **Add up to five users.**

Type in a name and password for each user, re-enter the password for each user, and designate the user as an admin or a user. If you change the admin user name or password, write the name and password down and save it in a secure location.

Note - Starting with FW 2.02, the username requires six characters and the password requires a minimum of eight characters.

Send System Log Messages to Systems on the Network (Enhanced PDU)

Setting	Characters (ISO - 8859-1)
UserName	Uppercase Letters, Lowercase Letters, and Numbers
Password	Uppercase Letters, Lowercase Letters, Numbers, and Special Characters (!, ", #, \$, %, &, ???, (,), *, +, -, @)

IP-Settings	PDU-Information	HTTP-Access	SNMP-Access	SNMP-Traps	Syslog	System Time	Event Logging	Firmware Update	StartUp / Reset
-------------	-----------------	-------------	-------------	------------	--------	-------------	---------------	-----------------	-----------------

HTTP enable	
Enable	<input checked="" type="checkbox"/>
Version	HTTP
Refresh Time for Metering Overview	1 s
Submit	

User Manager					
Nr.	Name	Password	Re-Enter Password	User	Admin
1.	admin	*****	*****	<input type="radio"/>	<input checked="" type="radio"/>
2.				<input checked="" type="radio"/>	<input type="radio"/>
3.				<input checked="" type="radio"/>	<input type="radio"/>
4.	david	*****	*****	<input checked="" type="radio"/>	<input type="radio"/>
5.	jina	*****	*****	<input type="radio"/>	<input checked="" type="radio"/>
Submit					

- Click the Submit button to set the PDU users and passwords.

▼ Send System Log Messages to Systems on the Network (Enhanced PDU)

You can set the PDU to send system log (syslog) messages to up to four systems on the network. syslog is the standard UNIX system logging utility, which monitors critical system events and configuration changes. These syslog messages are sent to the systems using user datagram protocol (UDP) port 514.

For more information about syslog, refer to the Oracle Solaris documentation and the syslogd(1M) and syslog.conf(4) man pages.

Example PDU syslog message:

```
Lines IN0: L1: 0.96kW 0.96kVA 8.02A 120.0V L2: 0.47kW 0.56kVA 4.65A 121.6V L3: 0.50kW 0.56kVA
4.66A 121.1V
```


Lines IN1: L1: 0.93kW 0.93kVA 7.75A 120.0V L2: 0.47kW 0.55kVA 4.59A 121.6V L3: 0.47kW 0.53kVA
 4.44A 121.1V
 Inputs: IN0: 1.93kW IN1: 1.88kW
 PDU: 3.82kW

In the example, Lines IN0: L1: 0.96kW 0.96kVA 8.02A 120.0V, is a message for Input 0, Phase 1. The PDU is consuming 8.02A, 0.96 kVA, and 0.96kW with 120.0V applied.

Inputs: IN0: 1.93kW, displays the message of the power consumed by Input 0.PDU: 3.82kW, displays the message of the power consumed by the PDU.

1. **Access the PDU metering unit from a system on the network.**
 See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100.
2. **Click on the Net Configuration link and log in as an admin user.**
 See [“Login Information”](#) on page 60.
3. **Select the Syslog tab.**

Note - This screenshot applies only to FW version 2.01, not FW version 2.02. The syslog and reset functionalities are not available in FW version 2.02.

IP-Settings	PDU-Information	HTTP-Access	SNMP-Access	SNMP-Traps	Syslog	System Time	Event Logging	Firmware Update	StartUp / Reset
-------------	-----------------	-------------	-------------	------------	--------	-------------	---------------	-----------------	-----------------

Syslog	
Enable	<input checked="" type="checkbox"/>
<input type="button" value="Submit"/>	

Destinations		
Host	IP-Address or Host-Name	Enable
1.	<input type="text"/>	<input type="checkbox"/>
2.	<input type="text"/>	<input type="checkbox"/>
3.	<input type="text"/>	<input type="checkbox"/>
4.	<input type="text"/>	<input type="checkbox"/>
<input type="button" value="Submit"/>		

Time interval for repeating values	
Hour(s):	<input type="text" value="3"/>
Minute(s):	<input type="text" value="5"/>
Second(s):	<input type="text" value="7"/>
Alarms:	<input checked="" type="checkbox"/>
<input type="button" value="Submit"/>	

Values				
	Current	Voltage	Active Power	Apperant Power
PDU	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Input(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Line(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Submit"/>				

4. **For FW version 2.01, click the Syslog Enable checkbox to enable remote syslog message logging, then click the Submit button.**

Note - This step is no longer required beginning with FW version 2.02.

5. **Type in up to four IP addresses and click the enable box next to the IP address of systems you want the metering unit to send syslog messages, then click the Submit button below the IP addresses.**

6. **Set the time duration between sending syslog messages.**

Valid time settings include:

- **Hours: 0 - 23**
- **Minutes: 0 - 59**
- **Seconds: 0 - 59**

For example, if you set the duration for 12 hours, the PDU sends syslog messages every 12 hours.

7. **Click the Alarms checkbox to send alarm messages over syslog messages.**

If checked, and if you set threshold parameter values (see [“Set Threshold Parameter Values \(Enhanced PDU\)” on page 101](#)), the metering unit sends alarm messages when threshold parameter values are reached.

Possible syslog alarm messages are shown in [“Enabling and Configuring SNMP \(Enhanced PDU\)” on page 114](#).

8. **Click the Submit button to enable these syslog settings.**

9. **Select values to be sent to syslog systems then click the Submit button to enable.**

Enabling and Configuring SNMP (Enhanced PDU)

The PDU metering unit supports Simple Network Management Protocol (SNMP). SNMP provides the ability to send traps, or notifications, when one or more conditions have been met. If you enable SNMP, the metering unit can send and receive traps to and from SNMP agents on the network.



Caution - Do not place more than three get commands in a single SNMP request. Additional get commands might cause the PDU to experience a network hang.

Note - These sections do not describe how to view SNMP trap information using an SNMP agent. Refer to your SNMP agent documentation for details on how to use it to view SNMP-based information.

- [“Types of PDU Metering Unit SNMP Traps \(Enhanced PDU\)” on page 115](#)
- [“Enable and Configure SNMP \(Enhanced PDU\)” on page 116](#)
- [“Configure SNMP Traps” on page 118](#)

Types of PDU Metering Unit SNMP Traps (Enhanced PDU)

The following table describes the SNMPv2 traps the metering unit can send to SNMP agents on the network (over UDP port 162). In the trap descriptions, *InputNum/LineNum* corresponds to the input number and line number of the PDU (for example, Input1/Line2).

Note - The InputNum for SNMP Traps start at 1, not 0.

SNMP Trap	SNMP Notification	Description
Keep alive	KeepAlive-Trap	The PDU sends a KeepAlive-Trap message to the SNMP host to ensure that the link between them is operational.
Dead	Dead-Trap	Sent after a PDU power cycle.
Current Info	Info-Trap on <i>InputNum/LineNum</i>	Attached equipment is using less current than expected.
Current Warning	Warning-Trap on <i>InputNum/LineNum</i>	Attached equipment is using more current than expected.
Current Alarm	Alarm-Trap on <i>InputNum/LineNum</i>	Attached equipment is using a critical amount of current and requires immediate attention.
Current Out of balance	OutOfBalance-Trap on <i>InputNum/LineNum</i>	The equipment attached to one phase is using more current than the other phases on the input. The PDU and attached equipment require immediate attention.
Current Return to normal	ReturnToNormal-Trap on <i>InputNum/LineNum</i>	After sending an alarm trap, the attached equipment has returned to using the expected amount of current.

SNMP Trap	SNMP Notification	Description
Voltage Warning	Warning-Trap on InputNum/LineNum	Attached equipment is operating with undesired but acceptable voltage level.
Voltage Alarm	Alarm-Trap on InputNum/LineNum	Attached equipment is operating with an unacceptable voltage level.
Voltage return to normal	ReturnToNormal-Trap on InputNum/LineNum	Attached equipment is operating with an expected voltage level.

▼ Enable and Configure SNMP (Enhanced PDU)

Use the HTML interface to enable SNMP, NMS community hosts, and SNMP users.

Note - Screenshots with the reset functionality are from FW version 2.01. The reset functionality is not available beginning with FW version 2.02.

- 1. Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100.
- 2. Click on the Net Configuration link and log in as an admin user.**
See [“Login Information”](#) on page 60.

3. Select the SNMP-Access tab.

IP-Settings	PDU-Information	HTTP-Access	SNMP-Access	SNMP-Traps	Syslog	SystemTime	EventLogging	Firmware Update	StartUp / Reset
-------------	-----------------	-------------	--------------------	------------	--------	------------	--------------	-----------------	-----------------

SNMP	
Enable SNMPv1/v2	<input checked="" type="checkbox"/>
Enable SNMPv3	<input type="checkbox"/>
SNMP-Port	161
Select SNMP-MIB	RMI-MIB <input type="radio"/> RMI-compatible MIB <input checked="" type="radio"/>
Submit	

NMS (SNMPv1/v2)						
Host	IP-Address or Host-Name	read-write community	read-only community	access	enable	
1.	10.153.115.17	private	public	read-write	<input checked="" type="checkbox"/>	
2.				read-only	<input type="checkbox"/>	
3.				read-only	<input type="checkbox"/>	
4.				read-only	<input type="checkbox"/>	
Submit						

SNMPv3								
Engine ID:	0x 80 00 0a d1 03 00 0b 38 be d0 11							
Nr.	UserName	Security Level	Auth Algorithm	Auth Password	Privacy Algorithm	Privacy Password	Access	Enable
1.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
2.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
3.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
4.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
5.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
6.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
7.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
8.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
9.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
10.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
Submit								

4. Click the SNMP v1/v2, or v3 Enable checkbox to enable SNMP.

If desired, you can disable HTTP access to the PDU by deselecting the HTTP enable checkbox on the HTTP-Access tab of the Net Configuration page.

IP-Settings	PDU-Information	HTTP-Access	SNMP-Access	SNMP-Traps	Syslog	SystemTime	EventLogging	Firmware Update	StartUp / Reset
-------------	-----------------	--------------------	-------------	------------	--------	------------	--------------	-----------------	-----------------

HTTP enable	
Enable	<input checked="" type="checkbox"/>
Version	HTTP
Refresh Time for Metering Overview	1 s
Submit	

User Manager					
Nr.	Name	Password	Re-Enter Password	User	Admin
1.	admin	*****	*****	<input type="radio"/>	<input checked="" type="radio"/>
2.				<input checked="" type="radio"/>	<input type="radio"/>
3.				<input type="radio"/>	<input type="radio"/>
4.	david	*****	*****	<input checked="" type="radio"/>	<input type="radio"/>
5.	jina	*****	*****	<input type="radio"/>	<input checked="" type="radio"/>
Submit					



Caution - If you disable HTTP, you are no longer be able to log in to the HTML interface using a web browser. To re-enable HTTP access, you can use your SNMP agent software. Refer to the SNMP agent documentation or the Oracle Solaris snmpset(1M) man page for more information. You can also use the CLI command to re-enable HTTP, pducli -> set net_web_version=1 or 2 (1 for HTTP, 2 for HTTPS.).

5. Select the appropriate MIB and click submit.

The enhanced PDU is the default MIB setting.

6. Define up to four NMS hosts on the network for SNMP v1/v2 then click submit.

A network management station (NMS) host runs network management applications that monitor and control SNMP-managed devices. NMS hosts provide the resources required for network management.

7. Define up to 10 SNMP v3 users then click submit.

For each user select security level, auth algorithm, privacy algorithm, access type, and then check the enable box to enable this user.

See Step 4 in [“Add Users and Change Passwords \(Enhanced PDU\)”](#) on page 111.

SNMPv3								
Engine ID	0x80 00 0a d1 03 00 0b 38 be d0 11							
Nr.	UserName	Security Level	Auth Algorithm	Auth Password	Privacy Algorithm	Privacy Password	Access	Enable
1.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
2.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
3.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
4.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
5.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
6.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
7.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
8.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
9.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
10.		no auth / no priv	MD5		DES		read-only	<input type="checkbox"/>
Submit								

▼ Configure SNMP Traps

Use the HTML interface to specify SNMP trap hosts, trap options, and test trap configurations.

Note - Screenshots with the reset functionality are from FW version 2.01. The reset functionality is not available beginning with FW version 2.02.

1. **Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100.
2. **Click on the Net Configuration link and log in as an admin user.**
3. **Select the SNMP-Traps tab.**
4. **Define up to ten SNMP trap hosts then click submit.**

Once configured, the Metering unit sends SNMP traps to the hosts that are enabled. For each host enter the IP address or host name and community name. Select the SNMP trap version and check the enable box for traps to be sent to this host. If v3 SNMP traps are selected, select the user associated with this host.

IP-Settings	PDU-Information	HTTP-Access	SNMP-Access	SNMP-Traps	Syslog	SystemTime	EventLogging	Firmware Update	StartUp / Reset
-------------	-----------------	-------------	-------------	------------	--------	------------	--------------	-----------------	-----------------

Trap Host Setup					
Host	IP-Address or Host-Name	Community	User	Version	Enable
1.	10.153.115.17	public	1:.....	V1	<input checked="" type="checkbox"/>
2.	10.153.115.17	public	1:.....	V1	<input type="checkbox"/>
3.	10.153.115.17	public	1:.....	V1	<input type="checkbox"/>
4.	10.153.115.17	public	1:.....	V1	<input type="checkbox"/>
5.	10.153.115.17	public	1:.....	V1	<input type="checkbox"/>
6.	10.153.115.17	public	1:.....	V2	<input type="checkbox"/>
7.	10.153.115.17	public	1:.....	V2	<input type="checkbox"/>
8.	10.153.115.17	public	1:.....	V2	<input type="checkbox"/>
9.	10.153.115.17	public	1:.....	V2	<input type="checkbox"/>
10.	10.153.115.17	public	1:.....	V2	<input type="checkbox"/>

Trap options	
SNMP-Trap Port	162
Interval Keep Alive Trap	0 s
Interval for repeating Traps	1 s
Number of Traps	1

Check trap settings	
Send a test trap	<input type="button" value="Start"/>

5. **Provide values to the repeating trap settings.**

Here is a description of these repeating trap settings.

Setting	Description	Permitted Values
KeepAlive Trap	The number of seconds between repeating the KeepAlive trap.	0 - 60
Repeating Time for Traps	The number of seconds between sending trap messages to SNMP hosts.	0 - 60
Number of traps	The number of times the same trap can repeated to the same host.	0 -255

6. **Click the Submit button to enable these SNMP settings.**
7. **Send a test trap to verify the SNMP settings.**

Verifying and Updating the Firmware (Enhanced PDU)

The PDU metering input contains firmware that operates the LCD screen and provides the HTML interface. This firmware might be updated in the future to correct issues and provide new functionality.

- [“View Module Information \(Enhanced PDU\)” on page 120](#)
- [“Update the PDU Metering Unit Firmware \(HTML\)” on page 121](#)
- [“Update the PDU Metering Unit Firmware \(SSH\)” on page 122](#)

▼ View Module Information (Enhanced PDU)

Before downloading any new firmware, confirm the firmware revision level currently running on the PDU metering unit.

1. **Access the PDU metering unit from a system on the network.**
See [“Access a Metering Unit on the Network \(Enhanced PDU\)” on page 100](#).

2. Click on the Module Info link to verify the firmware revision level, as well as other information, on the Module Info page.

FRUID	
PDU Part Number	
PDU Serial Number	
PDU Date of manufacture	
PDU Product Description	
System Info	
Hardware Version	01/C
Firmware Version	00.01T13 - 23.04.2014
Bootloader Version	00.01 - 15.10.2013
MAC-Address	00-0b-38-bc-d0-11
User Settings	
PDU Name	RMII PDU for Documentation
PDU Product Identifier	
PDU Rack Serial Number	
PDU Location	SCA12-1750

▼ Update the PDU Metering Unit Firmware (HTML)

You can download updates of the PDU metering unit firmware from the My Oracle Support (MOS) web site.

Note - Updating the firmware does not overwrite any configurations you set previously.

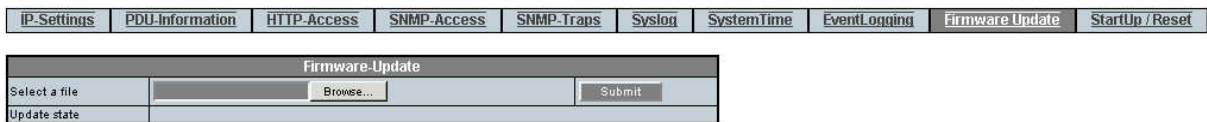
1. **Using a web browser, connect to the MOS web site:**
<https://myoraclesupport.com>
2. **Locate and download the latest version of the firmware.**
To locate the latest PDU firmware, search the Download Center for the *Oracle Rack 1242*. Follow the instructions on the web site to download the firmware.
3. **Save the downloaded firmware ZIP file to a directory accessible to the PDU over the network.**
4. **Use the unzip command to extract the metering unit firmware from the downloaded ZIP file.**

The downloaded ZIP file contains one update file:

■ **MKAPP_Vx.x.dl – metering unit firmware**

If the ZIP file also contains a text file, review it for any additional information about the firmware updates.

5. **Access the PDU metering unit from a system on the network.**
See “[Access a Metering Unit on the Network \(Enhanced PDU\)](#)” on page 100.
6. **Click on the Net Configuration link and log in as an admin user.**
See “[Login Information](#)” on page 60.
7. **Select the Firmware-Update tab.**



8. **Click on the Browse button and locate the MKAPP_Vx.x.dl file you downloaded previously.**
9. **Click the Submit button update the metering unit firmware.**
10. **Confirm that you updated the firmware successfully.**
See “[View Module Information \(Enhanced PDU\)](#)” on page 120 for instructions on viewing the firmware revision level.

▼ **Update the PDU Metering Unit Firmware (SSH)**

1. **Using a web browser, connect to the MOS web site:**
<https://myoraclesupport.com>
2. **Locate and download the latest version of the firmware.**
To locate the latest PDU firmware, search the Download Center for the *Oracle Rack 1242*. Follow the instructions on the web site to download the firmware.

3. **Save the downloaded firmware ZIP file to a directory accessible to the PDU over the network.**
4. **Use the `unzip` command to extract the metering unit firmware from the downloaded ZIP file.**

The downloaded ZIP file contains one update file:

- **MKAPP_Vx.x.dl – metering unit firmware**

If the ZIP file also contains a text file, review it for any additional information about the firmware updates.

5. **Using an appropriate SSH application, execute the following command.**

```
scp MKAPP_Vx.x.dl admin@xxx.xxx.xxx.xxx:Firmware.dl
xxx.xxx.xxx.xxx = PDU ipaddr
```

6. **When prompted, enter the admin password.**
See [“Login Information” on page 60](#).
7. **When finished, the PDU will reboot and disconnect from the SSH application.**
8. **Confirm that you updated the firmware successfully.**
See [“View Module Information \(Enhanced PDU\)” on page 120](#).

Administering the PDU Metering Unit (Enhanced PDU)

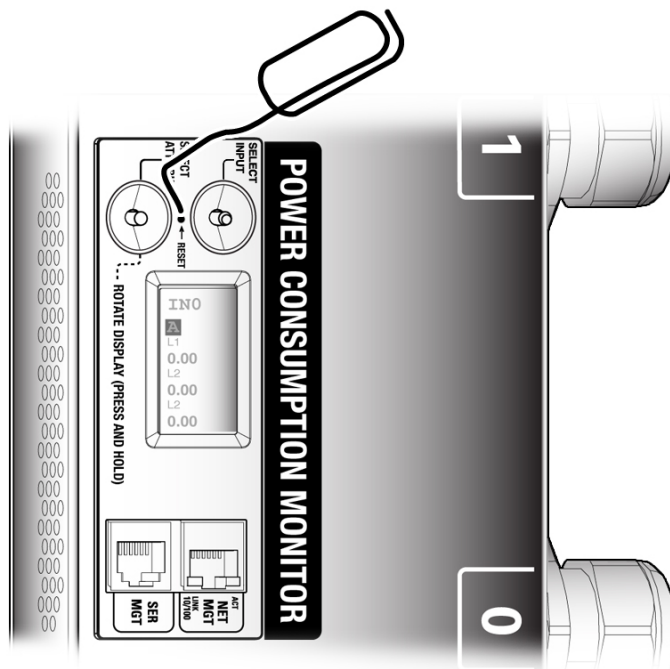
Besides monitoring the power, energy, and current of attached equipment and the voltage powering the equipment, you can reboot the PDU, view information about the network connection and firmware revisions, set the time, check events, and adjust the LCD screen.

- [“Reset the Enhanced PDU Metering Unit \(Reset Button\)” on page 124](#)
- [“Reboot the Enhanced PDU Metering Unit \(LCD\)” on page 124](#)
- [“Reboot the Enhanced PDU Metering Unit \(HTML\)” on page 125](#)
- [“Reboot the Enhanced PDU Metering Unit \(RS-232\)” on page 125](#)
- [“Reboot the Enhanced PDU Metering Unit \(SSH\)” on page 126](#)
- [“View Status Information on the LCD Screen \(Enhanced PDU\)” on page 126](#)
- [“Adjust the LCD Screen \(Enhanced PDU\)” on page 128](#)
- [“Set the PDU System Time” on page 128](#)
- [“Access the Event Logging Page” on page 130](#)

Note - Restarting the metering unit does not power cycle equipment attached to the PDU.

▼ Reset the Enhanced PDU Metering Unit (Reset Button)

- Press the Reset button with a paper clip.



▼ Reboot the Enhanced PDU Metering Unit (LCD)

1. Press and hold the buttons for 10 seconds until you see a five-second countdown displayed on the LCD screen.

See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100.

2. During the five-second countdown, release the buttons and then tap the buttons again to reboot the PDU.

▼ Reboot the Enhanced PDU Metering Unit (HTML)

1. Log in to the PDU metering unit.
See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100.
2. Click on the Net Configuration link and log in as an *admin* user.
See [“Login Information”](#) on page 60.
3. Select the StartUp/Reset heading.

IP-Settings	PDU-Information	HTTP-Access	SNMP-Access	SNMP-Traps	Syslog	SystemTime	EventLogging	FirmwareUpdate	StartUp / Reset
StartUp									
Display-InfoPageTime		5						s	
Submit									
Factory-Reset									
Set PDU to factory settings									
Submit									
Button-ResetTime		10						s	
Submit									
Restart-PDU									
Restart PDU									
Submit									

4. Click the Submit button next to the Restart PDU to reboot the PDU Monitoring Unit.

▼ Reboot the Enhanced PDU Metering Unit (RS-232)

1. Connect an RS-232 cable between the SER MGT port and the host.
2. Configure the host's terminal or terminal emulator.
See [“Terminal Configuration Settings”](#) on page 60.
3. When prompted, log in as *admin*.

```
Welcome to Oracle PDU <host name>
pducli -> username:
pducli -> password:
```

See [“Login Information” on page 60](#).

4. After successful login, type.

```
pducli -> reset=yes
```

▼ Reboot the Enhanced PDU Metering Unit (SSH)

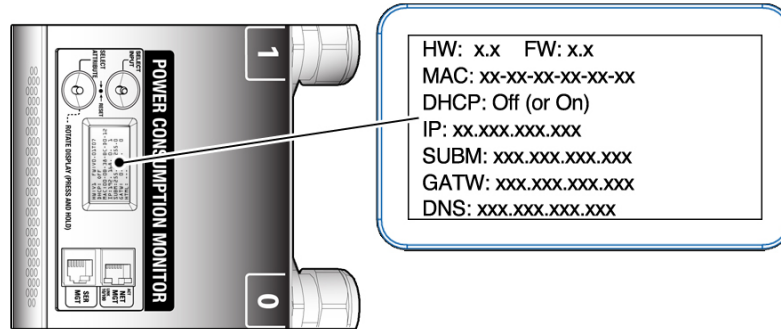
1. **Connect an Ethernet cable between the NET MGT and the host.**
2. **Configure the SSH application with the PDU IP Address.**
3. **When prompted, log in as admin.**
See [“Login Information” on page 60](#).
4. **After successful login, type.**

```
pducli -> reset=yes
```

▼ View Status Information on the LCD Screen (Enhanced PDU)

When the PDU metering unit resets or powers on, you can view network and firmware version level information on the LCD screen.

- Press the Select Attribute button until the PDU information appears.



The screen displays the following information:

```

HW: x.x      FW:x.x
DHCP: OFF (or ON)
MAC: xx-xx-xx-xx-xx-xx
IP: xxx.xxx.xxx.xxx
SUB:xxx.xxx.xxx.xxx
GATW:xxx.xxx.xxx.xxx
DNS: xxx.xxx.xxx.xxx
  
```

The following table describes the LCD screen information.

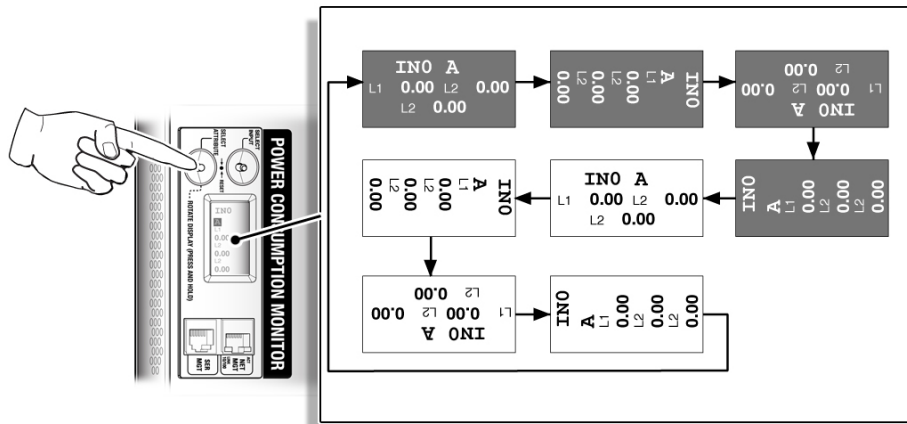
LCD Text	Description
HW	Version of the PDU hardware.
FW	Version of the PDU firmware.
DHCP	Displays ON, when DHCP is enabled, and OFF when DHCP is disabled. See “Connect an Original PDU to a DHCP Network” on page 42 for more information about DHCP.
MAC	MAC address of the metering unit.
IP	IP address of the metering unit. <ul style="list-style-type: none"> ■ If DHCP is OFF, the IP address is an internally stored static address. ■ If DHCP is ON, the IP address is set by the DHCP server.
SUB NET MASK	IP subnet netmask.
GATEWAY	IP address of the gateway router.
DNS	IP address of the DNS server of the metering unit.

▼ Adjust the LCD Screen (Enhanced PDU)

You can adjust the LCD screen orientation and background to help you view the screen within the rack.

- **Press and hold the Select Attribute button until the LCD screen rotates 90 degrees.**

Continue to press and release the Select Attribute button to cycle through different LCD screen orientations. The first four screens have black text on a white background, while the other four have white text on a black background. The final selected screen becomes the new default orientation.



▼ Set the PDU System Time

Use the HTML interface to set the PDU time and configure the NTP server.

Note - Screenshots with the reset functionality are from FW version 2.01. The reset functionality is not available beginning with FW version 2.02.

1. **Log in to the PDU metering unit.**

See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100.

2. Click on the **Net Configuration** link and log in as an admin user.

See [“Login Information”](#) on page 60.

3. Select the **System Time** tab.

IP Settings	PDU Information	HTTP Access	SNMP Access	SNMP Traps	Syslog	System Time	Event Logging	Firmware Update	StartUp / Reset
Manual Settings									
Date: year/month/day	1970	January	1						
Time: hours/minutes/seconds	3	26	21						
Submit									
NTP Server Settings									
Enable	<input checked="" type="checkbox"/>								
NTP Server									
Time zone	(GMT-03:30) Newfoundland								
Poll interval	3	hours							
Last sync	----								
Submit									
Current PDU System Time									
Time	1970-01-01 03:26:33								

4. Enter the current date and time and click submit.
5. If necessary for your location, enable daylight saving time and click submit.

Note - Enabling daylight saving time will add an hour to the previously set time. The time will not automatically return to standard time when daylight saving time ends. Disable this setting once Daylight Saving Time ends for your location.

DST (Daylight Saving Time) Settings	
Enable	<input type="checkbox"/>
Submit	

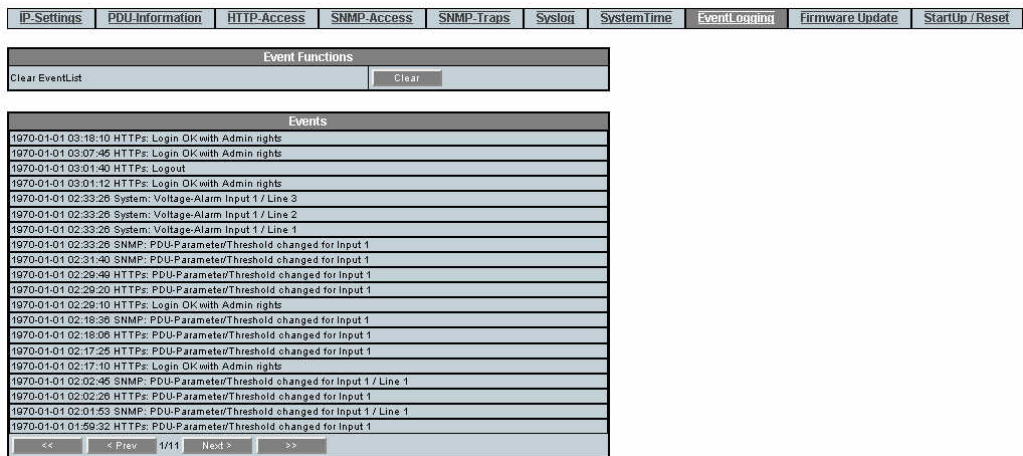
6. Configure the NTP server and click submit.

Note - If the NTP is not enabled, rebooting the PDU resets the date to 1970 January 1.

▼ Access the Event Logging Page

Use the HTML interface to review the last 1,000 events.

1. **Log in to the PDU metering unit.**
See [“Access a Metering Unit on the Network \(Enhanced PDU\)”](#) on page 100.
2. **Click on the Net Configuration link and log in as an admin user.**
See [“Login Information”](#) on page 60.
3. **Select the EventLogging tab.**



Restoring the PDU to Factory Default Settings (Enhanced PDU)

If you need to correct a configuration error, or you want to clear the PDU before moving it to a different rack, you can restore the PDU metering unit back to its factory settings.

After restoring the unit, all network and configuration settings reset back to their default values (for example, admin is the only user and the IP address returns to 0.0.0.0 with DHCP enabled). All settings that you set for your environment are lost.

Note - After restoring the PDU metering unit back to its factory settings, you must reconnect it to the network. See [“Connecting PDUs to the Network” on page 41](#) for instructions.

- [“Restore the PDU to Factory Default Settings \(LCD\)” on page 131](#)
- [“Restore the PDU to Factory Default Settings \(HTML\)” on page 131](#)
- [“Restore the PDU to Factory Default Settings \(RS-232\)” on page 132](#)
- [“Restore the PDU to Factory Default Settings \(SSH\)” on page 132](#)

▼ Restore the PDU to Factory Default Settings (LCD)

You can restore the PDU to factory default settings using the two buttons on the LCD.

1. **Press and hold the buttons for 10 seconds until you see a five-second countdown displayed on the LCD screen.**
2. **During the five-second countdown, release the buttons and then press and hold the buttons.**
The countdown continues.
3. **At the end of the five-second countdown, a ten-second countdown starts, prompting you to hold the buttons until it completes.**
4. **At the end of the ten-second countdown, a second five-second countdown is displayed on the LCD screen.**
5. **During the second five-second countdown, release the buttons and then tap the buttons again to force the PDU to reset to factory defaults.**

▼ Restore the PDU to Factory Default Settings (HTML)

1. **Log in to the PDU metering unit.**
See [“Access a Metering Unit on the Network \(Enhanced PDU\)” on page 100](#).
2. **Click on the Net Configuration link and log in as an *admin* user.**
See [“Login Information” on page 60](#).

3. **Select StartUp/Reset heading.**

Note - Screenshots with the reset functionality are from FW version 2.01. The reset functionality is not available beginning with FW version 2.02.

The screenshot shows a web interface with a navigation bar at the top containing the following tabs: IP-Settings, PDU-Information, HTTP-Access, SNMP-Access, SNMP-Traps, Syslog, SystemTime, EventLogging, Firmware Update, and StartUp /Reset. The StartUp /Reset tab is selected. Below the navigation bar, there are three main sections:

- StartUp**: Contains a field for "Display-InfoPageTime" with a value of "6" and a "Submit" button.
- Factory-Reset**: Contains two fields: "Set PDU to factory settings" with a "Submit" button, and "Button-ResetTime" with a value of "10" and a "Submit" button.
- Restart-PDU**: Contains a "Restart PDU" field with a "Submit" button.

4. **Click the Submit button to restore the PDU metering unit back to its default factory settings.**

▼ Restore the PDU to Factory Default Settings (RS-232)

1. **Connect an RS-232 cable between the SER MGT port and the host.**
2. **Configure the host's terminal or terminal emulator.**
See [“Terminal Configuration Settings” on page 60.](#)
3. **When prompted, log in as an admin user.**
See [“Login Information” on page 60.](#)
4. **After successful login, type.**

```
pducli -> factory_default=yes
```

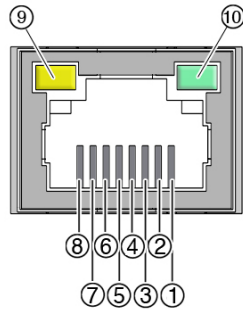
▼ Restore the PDU to Factory Default Settings (SSH)

1. **Connect an Ethernet cable between the NET MGT and the host.**

2. **Configure the SSH application with the PDU IP address.**
3. **When prompted, log in as an admin user.**
See [“Login Information” on page 60.](#)
4. **After successful login, type.**

```
pducli -> factory_default=yes
```

NET MGT Port LED and Pin Descriptions



Pin	Signal Description	Pin	Signal Description
1	Transmit+ (TX+)	6	Receive- (RX-)
2	Transmit- (TX-)	7	Not used
3	Receive+ (RX+)	8	Not used
4	Not used	9	Activity LED – flashes when network data is being transmitted through the port
5	Not used	10	Link LED – lights when the unit is connected to a network

SER MGT Ports and Pin Descriptions

The SER MGT RJ-45 port, provides an TIA/EIA-232 serial Oracle/Cisco standard connection to the SP. This port is the default connection to the Oracle ILOM system controller. For DTE

to DTE communications, you can use the supplied RJ-45 to DB-9 crossover adapter with a standard RJ-45 cable to achieve the required null modem configuration.



Pin	Signal Description	Pin	Signal Description
1	Request to Send	5	Ground
2	Data Terminal Ready	6	Receive Data
3	Transmit Data	7	Data Set Ready
4	Ground	8	Clear to Send

Understanding CLI Commands

This chapter contains information about user and administrator commands.

- [“Help Commands” on page 135](#)
- [“Understanding User and Administrator Commands” on page 136](#)
- [“Understanding Administrator-Only Commands” on page 140](#)

Help Commands

After successful login, you can use different commands at the CLI prompt.

Starting with FW 2.02, typing `help` or `?` at the command prompt provides a list of covered topics. The list of covered topics might be different between firmware releases.

```
pducli -> help  
<list of provided topics based on firmware version>
```

TABLE 15 List of Covered Topics for the `help` Command

Topics	Syntax
PDU-SystemInfo	pducli -> help PDU-SystemInfo
NetworkServices	pducli -> help NetworkServices
NetworkPorts	pducli -> help NetworkPorts
IPv4-Configuration	pducli -> help IPv4-Configuration
IPv6-Configuration	pducli -> help IPv6-Configuration
Host-Configuratoin	pducli -> help Host-Configuration
User-Configuration	pducli -> help User-Configuration
SystemTime	pducli -> help SystemTime
PowerInfo (Total PDU)	pducli -> help PowerInfo (Total PDU)
PowerInfo (Inputs)	pducli -> help PowerInfo (Inputs)

Topics	Syntax
PowerInfo (Lines)	<code>pducli -> help PowerInfo (Lines)</code>
PDU-EventList	<code>pducli -> help PDU-EventList</code>

Each topic contains a list of valid commands for the PDU. To get a list of valid commands for a topic, type:

```
pducli -> help topic-name
```

Note - Some commands are restricted to accounts with admin privileges only.

To get help on a specific command, type:

```
pducli -> help command-name
```

This command provides information on how to use the command in the format:

```
pducli -> help command-name parameter value <(if applicable)>
```

Understanding User and Administrator Commands

These topics describe commands for users and administrators.

- [“User and Administrator Commands” on page 136](#)
- [“PDU System Information Parameters \(get Command\)” on page 137](#)
- [“Power Information Parameters” on page 137](#)
- [“Input Parameters” on page 138](#)
- [“Line Parameters” on page 139](#)

User and Administrator Commands

TABLE 16 User and Administrator Commands

Command	Syntax	Description
get	<code>pducli -> get Params</code>	Gets PDU specific configuration and measurement parameters.
set	<code>pducli -> set Params=Values</code>	Sets PDU specific configuration and measurement parameters.

Command	Syntax	Description
exit	pducli -> exit	Exits the CLI and returns to the login prompt.

PDU System Information Parameters (get Command)

TABLE 17 PDU System Information Parameters (get Command) Available Starting with FW 2.02

Parameters	Syntax	Response
pdu_name	pducli -> get pdu_name	pducli -> pdu_name=xxxx
pdu_product_id	pducli -> get pdu_product_id	pducli-> pdu_product_id=xxxxx
pdu_rack_serial_number	pducli -> get pdu_rack_serial_number	pducli-> pdu_rack_serial_number=xxxxx
pdu_location	pducli -> get pdu_location	pducli-> pdu_location=xxxxx
pdu_part_number	pducli -> get pdu_part_number	pducli-> pdu_part_number=xxxxx
pdu_serial_number	pducli -> get pdu_serial_number	pducli-> pdu_serial_number=xxxxx
pdu_date_of_manufacture	pducli -> get pdu_date_of_manufacture	pducli-> pdu_date_of_manufacture=xxxxx
pdu_product_description	pducli -> get pdu_product_description	pducli-> pdu_product_description=xxxxx
pdu_hardware_version	pducli -> get pdu_hardware_version	pducli-> pdu_hardware_version=xxxxx
pdu_firmware_version	pducli -> get pdu_firmware_version	pducli-> pdu_firmware_version=xxxxx
pdu_bootloader_version	pducli -> get pdu_bootloader_version	pducli-> pdu_bootloader_version=xxxxx
pdu_mac_address	pducli -> get pdu_mac_address	pducli-> pdu_mac_address=XXXXXX
pdu_display_info_time	pducli -> get pdu_display_info_time	pducli-> pdu_display_info_time=xxxxx (with xxx in seconds)
pdu_web_gui_refresh_interval	pducli -> get pdu_web_gui_refresh_interval	pducli-> pdu_web_gui_refresh_interval=xx (with xx in seconds, 1-60 allowed)

Power Information Parameters

TABLE 18 Power Info on the Total PDU Parameters (get Command) Available Starting with FW 2.01

Parameters	Syntax	Response
pwr_power_system	pducli -> get pwr_power_system	pducli-> pwr_power_system=EU (or pwr_power_system=US)
pwr_total_pdu_power	pducli -> get pwr_total_pdu_power	pducli-> pwr_total_pdu_power=xxxxW
pwr_total_pdu_energy	pducli -> get pwr_total_pdu_energy	pducli-> pwr_total_pdu_energy=xxxxWh
pwr_total_pdu_max_load	pducli -> get pwr_total_pdu_max_load	pducli-> pwr_total_pdu_max_load=xxxxVA

Parameters	Syntax	Response
pwr_total_pdu_load	pducli -> get pwr_total_pdu_load	pducli-> pwr_total_pdu_load=xxx%

TABLE 19 Power Info on the Total PDU Parameters (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
power_total_pdu_energy	pducli -> set power_total_pdu_energy=0 (only 0 allowed for clear energy)	pducli-> set OK (or an error message)

Input Parameters

TABLE 20 Input Parameters (get Command) Available Starting with FW 2.01

Parameters	Syntax	Response
pwr_input_power	pducli -> get pwr_input_power.x	pducli-> pwr_input_power.x=yyyyW
pwr_input_energy	pducli -> get pwr_input_energy.x	pducli-> pwr_input_energy.x=yyyyWh
pwr_input_max_load	pducli -> get pwr_input_max_load.x	pducli-> pwr_input_max_load.x=yyyyVA
pwr_input_load	pducli -> get pwr_input_load.x	pducli-> pwr_input_load.x=yyy%

Note - Replace *x* with the input number (0 to 5).

TABLE 21 Input Parameters (get Command) Available Starting with FW 2.02

Parameters	Syntax	Response
pwr_input_outofbalance	pducli -> get pwr_input_outofbalance.x (<i>x</i> =input number)	pducli-> pwr_input_outofbalance.x=yyya (<i>yyy</i> =OutOfBalance Current in [A] for input <i>x</i>)
pwr_input_outofbalance_threshold_alarm	pducli -> get pwr_input_outofbalance_threshold_alarm.x (<i>x</i> =input number)	pducli-> pwr_input_outofbalance_threshold_alarm.x=yyya (<i>yyy</i> =OutOfBalance-AlarmThreshold in [A] for input <i>x</i>)
pwr_input_outofbalance_trap_enable	pducli -> get pwr_input_outofbalance_trap_enable.x (<i>x</i> =input number)	pducli-> pwr_input_outofbalance_trap_enable.x=0n (Or Off for input <i>x</i>)

TABLE 22 Inputs Parameters (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
power_input_energy	pducli -> set power_input_energy.x=0	pducli-> set OK (or an error message)

Parameters	Syntax	Response
	(Only 0 allowed for clear energy)	
pwr_input_outofbalance_threshold_alarm	pducli -> set pwr_input_outofbalance_threshold_alarm.x=yyy	pducli-> set OK (or an error message)
	(yyy=OutOfBalance-alarmThreshold in [A] for input x)	
pwr_input_outofbalance_trap_enable	pducli -> set pwr_input_outofbalance_trap_enable.x=0n	pducli-> set OK (or an error message)
	(Or Off for input x)	

Line Parameters

TABLE 23 Line Parameters (get Command) Available Starting with FW 2.01

Parameters	Syntax	Response
pwr_line_current	pducli -> get pwr_line_current.x.y	pducli-> pwr_line_current.x.y=zzzzA
pwr_line_voltage	pducli -> get pwr_line_voltage.x.y	pducli-> pwr_line_voltage.x.y=zzzzV
pwr_line_power	pducli -> get pwr_line_power.x.y	pducli-> pwr_line_power.x.y=zzzzW
pwr_line_energy	pducli -> get pwr_line_energy.x.y	pducli-> pwr_line_energy.x.y=zzzzWh
pwr_line_max_load	pducli -> get pwr_line_max_load.x.y	pducli-> pwr_line_max_load.x.y=zzzzVA
pwr_line_load	pducli -> get pwr_line_load.x.y	pducli-> pwr_line_load.x.y=zzz%

Note - Replace x with the input number (0 to 5) and y with the line number (1 to 3).

TABLE 24 Line Parameters (get Command) Available Starting with FW 2.02

Parameters	Syntax	Response
pwr_line_apparent_power	pducli -> get pwr_line_apparent_power.x.y	pducli-> pwr_line_apparent_power.x.y=zzzzVA
pwr_line_currrent_threshold_info	pducli -> get pwr_line_current_threshold_info.x.y	pducli-> pwr_line_current_threshold_info.x.y=zzzA
pwr_line_currrent_threshold_warning	pducli -> get pwr_line_current_threshold_warning.x.y	pducli-> pwr_line_current_threshold_warning.x.y=zzzA
pwr_line_currrent_threshold_alarm	pducli -> get pwr_line_current_threshold_alarm.x.y	pducli-> pwr_line_current_threshold_alarm.x.y=zzzA
pwr_line_voltage_threshold_warning	pducli -> get pwr_line_voltage_threshold_warning.x.y	pducli-> pwr_line_voltage_threshold_warning.x.y=zzzV

Parameters	Syntax	Response
pwr_line_voltage_threshold_alarm	pducli -> get pwr_line_voltage_threshold_alarm.x.y	pducli-> pwr_line_voltage_threshold_alarm.x.y=zzzV
pwr_line_trap_enable	pducli -> get pwr_line_trap_enable.x.y	pducli-> pwr_line_trap_enable.x.y=On (or Off for input x, line y)

Note - Replace x with the input number (0 to 5) and y with the line number (1 to 3).

TABLE 25 Line Parameters (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
pwr_line_energy	pducli -> set pwr_line_energy.x.y=0 (only 0 allowed for clear energy for input x, line y)	pducli-> set OK (or an error message)
pwr_line_current_threshold_info	pducli -> set pwr_line_current_threshold_info.x.y=zzz (zzz=Current-InfoThreshold in [A] for input x, line y)	pducli-> set OK (or an error message)
pwr_line_current_threshold_warning	pducli -> set pwr_line_current_threshold_warning.x.y=zzz (zzz= Current-WarningThreshold in [A] for input x, line y)	pducli-> set OK (or an error message)
pwr_line_current_threshold_alarm	pducli -> set pwr_line_current_threshold_alarm.x.y=zzz (zzz= Current-AlarmThreshold in [A] for input x, line y)	pducli-> set OK (or an error message)
pwr_line_voltage_threshold_warning	pducli -> set pwr_line_voltage_threshold_warning.x.y=zzz (zzz= Voltage-WarningThreshold in [A] for input x, line y)	pducli-> set OK (or an error message)
pwr_line_voltage_threshold_alarm	pducli -> set pwr_line_voltage_threshold_alarm.x.y=zzz (zzz= Voltage-AlarmThreshold in [V] for input x, line y)	pducli-> set OK (or an error message)
pwr_line_trap_enable	pducli -> set pwr_line_trap_enable.x.y=On (or Off for input x, line y)for input x, line y)	pducli-> set OK (or an error message)

Understanding Administrator-Only Commands

- [“Administrator-Only Commands” on page 141](#)
- [“PDU System Information Parameters \(set Command\)” on page 141](#)

- “Network Services Configuration Parameters” on page 142
- “Network Ports Configuration Parameters” on page 144
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- “System Time Configuration Parameters” on page 151

Administrator-Only Commands

TABLE 26 Administration-Only Commands

Command	Syntax	Description
set	pducli -> set <i>Params=Values</i>	Sets PDU specific configuration and measurement parameters.
get	pducli -> get <i>Params</i>	Gets PDU specific configuration and measurement parameters.
reset	pducli -> reset= yes	Reboots the PDU.
factory_default	pducli -> factory_default= yes	Sets PDU to factory default settings.

PDU System Information Parameters (set Command)

TABLE 27 PDU System Information Parameters (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
pdu_name	pducli -> set pdu_name= xxxx	pducli-> set OK (or an error message)
pdu_product_id	pducli -> set pdu_product_id= xxxx	pducli-> set OK (or an error message)
pdu_rack_serial_number	pducli -> set pdu_rack_serial_number= xxxx	pducli-> set OK (or an error message)
pdu_location	pducli -> set pdu_location= xxxx	pducli-> set OK (or an error message)
pdu_display_info_time	pducli -> set pdu_display_info_time= xx (xx is seconds; 1-60 allowed)	pducli-> set OK (or an error message)
pdu_web_gui_refresh_interval	pducli -> set pdu_web_gui_refresh_interval= xx (xx is seconds; 1-60 allowed)	pducli-> set OK (or an error message)

Note - Display Time is the time the Net Configuration is displayed on the PDU LCD screen before the screen displays current measurements.

Network Services Configuration Parameters

TABLE 28 Network Services Configuration Parameters (set Command) Available Starting with FW2.01

Parameters	Syntax	Response
net_web_version	pducli -> set net_web_version=x (0 for disable, 1 for HTTP, 2 for HTTPS)	pducli-> set OK (or an error message)
net_snmp_version	pducli -> set net_snmp_version=x (0 for disable, 1 for SNMPv2, 2 for SNMPv3, 3 to enable both versions)	pducli-> set OK (or an error message)
net_snmp_mib	pducli -> set net_snmp_mib=x (0 for enhanced PDU MIB, 1 for original PDU MIB)	pducli-> set OK (or an error message)
net_syslog_enable [†]	pducli -> set net_syslog_enable=0n	pducli-> set OK (or an error message)

[†]This command is available only in FW 2.01.

Note - After executing any combination of the commands above, execute a **reset=yes** command for the changes to take affect.

TABLE 29 Network Services Configuration Parameters (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
net_alivetrapped_interval	pducli -> set net_alivetrapped_interval=xx (xx=seconds: 0-60 allowed; 0=disabled)	pducli-> set OK (or an error message)
net_traprepeat_interval	pducli-> set net_traprepeat_interval=xx (xx=seconds: 0-60 allowed; 0=disabled)	pducli-> set OK (or an error message)
net_traprepeat_qty	pducli-> set net_traprepeat_qty=xx (xx=number for repeats; 0-255 allowed)	pducli-> set OK (or an error message)
net_testtrap_init	pducli-> set net_testtrap_init=yes (only available if Enhanced-MIB is selected)	pducli-> set OK (or an error message)
net_syslog_interval_hour	pducli -> set net_syslog_interval_hour=xx (xx= Interval in hours: 0-24 allowed)	pducli-> set OK (or an error message)
net_syslog_interval_min	pducli -> set net_syslog_interval_min=xx	pducli-> set OK (or an error message)

Parameters	Syntax	Response
	(xx=Interval in minutes: 0-59 allowed)	
net_syslog_interval_sec	pducli -> set net_syslog_interval_sec=xx	pducli-> set OK (or an error message)
	(xx= Interval in seconds; 0-59 allowed)	
net_syslog_alarm_enable	pducli-> set net_syslog_alarm_enable=on (or <i>net_syslog_alarm_enable=off</i>)	pducli-> set OK (or an error message)
net_syslog_values_enable_pdu	pducli -> set net_syslog_values_enable_pdu=xx (0 - disabled, 4 - active power)	pducli-> set OK (or an error message)
net_syslog_values_enable_inputs	pducli -> set net_syslog_values_enable_inputs=xx (0 - disabled, 4 - active power)	pducli-> set OK (or an error message)
net_syslog_values_enable_lines	pducli -> set net_syslog_values_enable_lines=xx (0 - disable, 1 - for Current, 2 - Voltage, 4 - ActivePower, 8 - ApparentPower => 15 Current/Voltage/ActivePower/ApparentPower)	pducli-> set OK (or an error message)

TABLE 30 Network Services Configuration Parameters (get Command) Available Starting with FW 2.01

Parameters	Syntax	Response
net_web_version	pducli -> get net_web_version	pducli-> net_web_version=1 (0 for disabled, 1 for HTTP, or 2 for HTTPS)
net_snmp_version	pducli -> get net_snmp_version	pducli-> net_snmp_version=3 (0 for disabled, 1 for SNMPv1/v2, 2 for SNMPv3, or 3 for both versions)
net_snmp_mib	pducli -> get net_snmp_mib	pducli -> net_snmp_mib=1 (0 for Enhanced PDU MIB or 1 for original PDU MIB)

TABLE 31 Network Services Configuration Parameters (get Command) Available Starting with FW 2.02

Parameters	Syntax	Response
net_term_version	pducli-> get net_term_version	pducli-> net_term_version=2 (2 for ssh; no other versions supported)
net_alivetrapp_interval	pducli-> get net_alivetrapp_interval	pducli-> net_alivetrapp_interval=xx (with xx in seconds: 0-60 allowed; 0 is disabled)
net_traprepeat_interval	pducli-> get net_traprepeat_interval	pducli-> net_traprepeat_interval=xx

Parameters	Syntax	Response
net_traprepeat_qty	pducli-> get net_traprepeat_qty	(with xx in seconds: 0-60 allowed; 0 is disabled) pducli-> net_traprepeat_qty=xx
net_syslog_interval_hour	pducli -> get net_syslog_interval_hour	(with xx number for repeats: 0-60 allowed) pducli-> net_syslog_interval_hour=xx
net_syslog_interval_min	pducli -> get net_syslog_interval_min	(with xx is the interval in hours: 0-24 allowed) pducli-> net_syslog_interval_min=xx
net_syslog_interval_sec	pducli -> get net_syslog_interval_sec	(with xx is the interval in minutes: 0-59 allowed) pducli-> net_syslog_interval_sec=xx
net_syslog_alarm_enable	pducli-> get net_syslog_alarm_enable	(with xx is the interval in seconds: 0-59 allowed) pducli-> net_syslog_alarm_enable=0n (or net_syslog_alarm_enable=0ff)
net_syslog_values_enable_pdu	pducli -> get net_syslog_values_enable_pdu	pducli-> net_syslog_values_enable_pdu=xx (with xx=0 for disable, or xx=4 for include ActivePower)
net_syslog_values_enable_inputs	pducli -> get net_syslog_values_enable_inputs	pducli-> net_syslog_values_enable_inputs=xx (with xx=0 for disable, xx=4 for include ActivePower)
net_syslog_values_enable_lines	pducli -> get net_syslog_values_enable_lines	pducli-> net_syslog_values_enable_lines=xx (xx=0 for disabled, xx=1 for include Current, xx=2 for include Voltage, xx=4 for include ActivePower, xx=8 for include ApparentPower => xx=15 for include Current/Voltage/ActivePower/ApparentPower)

Network Ports Configuration Parameters

TABLE 32 Network Ports Configuration Parameters (get Command) Available Starting with FW 2.02

Parameters	Syntax	Response
net_port_snmp	pducli -> get net_port_snmp	pducli-> net_port_snmp=161
net_port_trap	pducli -> get net_port_traps	pducli-> net_port_traps=162

TABLE 33 Network Ports Configuration Parameters (set Command) for FW 2.02

Parameters	Syntax	Response
net_port_snmp	pducli -> set net_port_snmp=161	pducli-> set OK (or an error message)
net_port_trap	pducli -> set net_port_traps=162	pducli-> set OK (or an error message)

IPv4 Configuration Parameters

TABLE 34 IPv4 Configuration Parameters (get Command) Available Starting with FW 2.01

Parameters	Syntax	Response
net_ipv4_dhcp	pducli -> get net_ipv4_dhcp	pducli-> net_ipv4_dhcp=0n (or net_ipv4_dhcp=0ff)
net_ipv4_ipaddr	pducli -> get net_ipv4_ipaddr	pducli-> net_ipv4_ipaddr=xxx.xxx.xxx.xxx
net_ipv4_subnet	pducli -> get net_ipv4_subnet	pducli-> net_ipv4_subnet=xxx.xxx.xxx.xxx
net_ipv4_gateway	pducli -> get net_ipv4_gateway	pducli-> net_ipv4_gateway=xxx.xxx.xxx.xxx
net_ipv4_dns1	pducli -> get net_ipv4_dns1	pducli-> net_ipv4_dns1=xxx.xxx.xxx.xxx
net_ipv4_dns2	pducli -> get net_ipv4_dns2	pducli-> net_ipv4_dns2=xxx.xxx.xxx.xxx

TABLE 35 IPv4 Configuration Parameters (set Command) Available Starting with FW 2.01

Parameters	Syntax	Response
net_ipv4_dhcp	pducli -> set net_ipv4_dhcp=0n (or net_ipv4_dhcp=0ff)	pducli-> set OK (or an error message)
net_ipv4_ipaddr	pducli -> set net_ipv4_ipaddr=xxx.xxx.xxx.xxx	pducli-> set OK (or an error message)
net_ipv4_subnet	pducli -> set net_ipv4_subnet=xxx.xxx.xxx.xxx	pducli-> set OK (or an error message)
net_ipv4_gateway	pducli -> set net_ipv4_gateway=xxx.xxx.xxx.xxx	pducli-> set OK (or an error message)
net_ipv4_dns1	pducli -> set net_ipv4_dns1=xxx.xxx.xxx.xxx	pducli-> set OK (or an error message)
net_ipv4_dns2	pducli -> set net_ipv4_dns2=xxx.xxx.xxx.xxx	pducli-> set OK (or an error message)

Note - After executing any combination of set commands for IPv4 configuration parameters, execute a **reset=yes** command for the changes to take affect.

IPv6 Configuration Parameters

TABLE 36 IPv6 Configuration Parameters (get Command) Available Starting with V2.07

Parameters	Syntax	Response
net_ipv6_enable	pducli -> get net_ipv6_enable	pducli-> net_ipv6_enable=0n (or net_ipv6_enable=0ff)
net_ipv6_manual_ip_enable	pducli -> get net_ipv6_manual_ip_enable	pducli-> net_ipv6_manual_ip_enable=0n (or net_ipv6_manual_ip_enable=0ff)
net_ipv6_ipaddr	pducli -> get net_ipv6_ipaddr	pducli-> net_ipv6_ipaddr=xxxx::xxxx,yyyy::yyyy (with list of all available IPv6-Addresses)

TABLE 37 IPv6 Configuration Parameters (get Command) Available Starting with V2.07

Parameters	Syntax	Response
net_ipv6_manual_ipaddr	pducli -> get net_ipv6_manual_ipaddr	pducli-> net_ipv6_manual_ipaddr=xxxx::xxxx (xxxx::xxxx = manual configured IPv6-Address)

TABLE 38 IPv6 Configuration Parameters (set Command) Available Starting with V2.07

Parameters	Syntax	Response
net_ipv6_enable	pducli -> set net_ipv6_enable=0n (or net_ipv6_enable=0ff)	pducli-> set OK (or an error message)
net_ipv6_manual_ip_enable	pducli -> set net_ipv6_manual_ip_enable=0n (or net_ipv6_manual_ip_enable=0ff)	pducli-> set OK (or an error message)
net_ipv6_manual_ipaddr	pducli -> set net_ipv6_manual_ipaddr=xxxx::xxxx	pducli-> set OK (or an error message)

PDU Events List Parameters

TABLE 39 PDU Event List Parameter (get Command) Available Starting with V2.07

Parameters	Syntax	Description
pdu_event_list	pducli -> get pdu_event_list-xx (with option xx is max. number of event for CLI output, without option xx -> default = 10 events)	pducli-> pdu_event_list=E1: yyyy.mm.dd/hh:mm:ss/xxxxxxxxyyyyy.mm.dd/hh:mm:ss/xxxxxxx (with yyyy.mm.dd is date, hh:mm:ss is time and xx is event info)

Note - A maximum of 1000 events can be handled from a PDU.

TABLE 40 PDU Event List Parameter (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
pdu_clear_event_list	pducli -> set pdu_clear_event_list=yes	pducli-> set OK (or an error message)

Host Configuration Parameters

TABLE 41 Host Configuration Parameters (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
snmp_nms_host	pducli -> set snmp_nms_host.x=yyyyy (yyyyy= Host Name, Host x from 1-4)	pducli-> set OK (or an error message)

Parameters	Syntax	Response
snmp_nms_community_readonly	pducli -> set snmp_nms_community_readonly.x=yyyy (yyyy= ReadOnly-Community, Host x from 1-4)	pducli-> set OK (or an error message)
snmp_nms_community_readwrite	pducli -> set snmp_nms_community_readwrite.x=yyyy (yyyy= ReadWrite-Community, Host x from 1-4)	pducli-> set OK (or an error message)
snmp_nms_accessright	pducli -> set snmp_nms_accessright.x=y (0=readonly, 1=read/write, 2=both, Host x from 1-4)	pducli-> set OK (or an error message)
snmp_nms_enable	pducli-> set snmp_nms_enable.x=0n (or Off, Host x from 1-4)	pducli-> set OK (or an error message)
snmp_traptarget_host	pducli-> set snmp_traptarget_host.x=yyyy (yyyyHost-Name, TrapTarget x from 1 to 10.)	pducli-> set OK (or an error message)
snmp_traptarget_version	pducli-> set snmp_traptarget_version.x=2	pducli-> set OK (or an error message)
snmp_traptarget_enable	pducli-> set snmp_traptarget_enable.x=0n	pducli-> set OK (or an error message)
snmp_nms_traptargethost	pducli-> set snmp_nms_traptargethost.x=yyyy (yyyy= Host Name, TrapTarget x from 1-10)	pducli-> set OK (or an error message)
snmp_nms_traptarget_community	pducli-> set snmp_nms_traptarget_community.x=yyyy (yyyy= SNMP Trap Community, TrapTarget x from 1-10)	pducli-> set OK (or an error message)
snmp_nms_traptarget_version	pducli -> set snmp_nms_traptarget_version.x=y (1=SNMPv1, 2=SNMPv2, 3=SNMPv3, TrapTarget x from 1-10)	pducli-> set OK (or an error message)
snmp_nms_traptarget_enable	pducli -> set snmp_nms_traptarget_enable.x=0n (or Off, TrapTarget x from 1-10)	pducli-> set OK (or an error message)
syslogserver_host	pducli -> set syslogserver_host.x=yyyy (yyyy= SyslogServer-Host, SyslogServer x from 1-4)	pducli-> set OK (or an error message)
syslogserver_enable	pducli -> set syslogserver_enable.x=0n (or Off, SyslogServer x from 1-4)	pducli-> set OK (or an error message)

X = represents the Host Number associated with either an IP address or Host Name.

yyyy = is the community name

For example:

```
pducli->set snmp_nms_host.4=User1
pducli->set OK
pducli->set snmp_nms_community_readonly.4=User1_Com_r
pducli->set OK
pducli->set snmp_nms_community_readwrite.4=User1_Com_w
pducli->set OK
pducli->
```

TABLE 42 Host Configuration Parameters (get Command) Available Starting with FW 2.02

Parameters	Syntax	Response
snmp_nms_host	pducli -> get snmp_nms_host.x	pducli-> -> snmp_nms_host.x= yyyy (yyyy= Host Name, Host x from 1-4)
snmp_nms_community_readonly	pducli -> get snmp_nms_community_readonly.x (x= Host-Number 1-4)	pducli -> snmp_nms_community_readonly.x=yyyy (yyyy= ReadOnly-Community for Host x)
snmp_nms_community_readwrite	pducli -> get snmp_nms_community_readwrite.x (x= Host-Number 1-4)	pducli -> snmp_nms_community_readwrite.x=yyyy (yyyy= ReadWrite-Community for Host x)
snmp_nms_accessright	pducli -> get snmp_nms_accessright.x x= Host-Number 1-4)	pducli -> snmp_nms_accessright.x=y (0=readonly, 1=read/write, 2=both, for Host x)
snmp_nms_enable	pducli-> get snmp_nms_enable.x (x= Host-Number 1-4)	pducli-> snmp_nms_enable.x=0n (or snmp_nms_enable.x=Off for Host x)
snmp_traptarget_host	pducli-> get snmp_traptarget_host.x (x= TrapTarget-Number from 1-10)	pducli-> snmp_traptarget_host.x=yyyy (yyyy= Host Name for TrapTarget x)
snmp_traptarget_community	pducli -> get snmp_nms_traptarget_community.x (x=TrapTarget-Number from 1-10)	pducli-> snmp_nms_traptarget_community.x=yyyy (yyyy= SNMP TrapCommunity for TrapTarget x)
snmp_traptarget_version	pducli -> get snmp_nms_traptarget_version.x (x= TrapTarget from 1-10)	pducli -> snmp_nms_traptarget_version.x=y (1=SNMPv1, 2=SNMPv2, 3=SNMPv3 for TrapTarget x)
snmp_traptarget_enable	pducli -> get snmp_nms_traptarget_enable.x (x= TrapTarget from 1-10)	pducli -> snmp_nms_traptarget_enable.x=0n (or snmp_nms_traptarget_enable.x=Off for TrapTarget x)

Parameters	Syntax	Response
syslogserver_host	pducli -> get syslogserver_host.x (x= SyslogServer-Number from 1-4)	pducli -> syslogserver_host.x=yyyy (yyyy= SyslogServer-Host for SyslogServer x)
syslogserver_enable	pducli -> get syslogserver_enable.x (x= SyslogServer-Number from 1-4)	pducli -> syslogserver_enable.x=0n (or syslogserver_enable.x=0ff for SyslogServer x)

User Configuration Parameters

TABLE 43 User Configuration Parameters (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
user_name	pducli -> set user_name.x=yyyy (yyyy= UserName, User-Number x from 1-5)	pducli-> set OK (or an error message)
user_password	pducli -> set password.x=yyyy (yyyy= UserPassword, User-Number x from 1-5)	pducli-> set OK (or an error message)
user_accessright	pducli -> set accessright.x=y (1= User, 2= Admin, User-Number x from 1-5)	pducli-> set OK (or an error message)
user_snmpv3_name	pducli -> set user_snmpv3_name.x=yyyy (yyyy= SNMPv3-UserName, SNMPv3- User x from 1-10)	pducli-> set OK (or an error message)
user_snmpv3_security_level	pducli -> set user_snmpv3_name.x=y (0= No Auth/No Priv, 1= Auth/No Priv, 2= Auth/Priv, Userx from 1-10) SNMPv3 UserName, SNMPv3 User x from 1-10)	pducli-> set OK (or an error message)
user_snmpv3_auth_alg	pducli -> set user_snmpv3_auth_alg.x=y (0= MD 3, 1 = SHA, SNMPv3 User x from 1-10)	pducli-> set OK (or an error message)
user_snmpv3_auth_password	pducli -> set user_snmpv3_auth_password.x=yyyy (yyyy= SNMOv3-AuthPassword, SNMPv3- User x from 1-10)	pducli-> set OK (or an error message)
user_snmpv3_priv_alg	pducli -> set user_snmpv3_priv_alg.x=y (0= DES, 2= AES, 3= AES192, 4= AES256, SNMPv3- User x from 1-10)	pducli-> set OK (or an error message)
user_snmpv3_priv_password	pducli -> set user_snmpv3_priv_password.x=yyyy	pducli-> set OK (or an error message)

Parameters	Syntax	Response
	(yyyy= SNMPv3-PrivPassword, SNMPv3- User x from 1-10)	
user_snmpv3_accessright	pducli -> set user_snmpv3_accessright.x=y	pducli-> set OK (or an error message)
	(0=readonly, 1=readwrite, SNMPv3- User x from 1-10)	
user_snmpv3_enable	pducli -> set user_snmpv3_enable.x=0n	pducli-> set OK (or an error message)
	(or Off, SNMPv3- User x from 1-10)	

Examples of CLI commands and responses

Example 1:

```
set user_name.2=Thisisusertwo
get user_name.2
user_name.2=Thisisusertwo
```

Example 2:

```
get user_accessright.2
user_accessright.2=0
```

Note - user_accessright.2=0 indicated that the new user has not been set up as a user or admin.

Example 3:

```
set user_password.2=Let2inplease
set OK
```

Example 4:

```
set user_accessright.2=1
set OK

get user_accessright.2
user_accessright.2=1
```

TABLE 44 User Configuration Parameters (get Command) Available Starting with FW 2.02

Parameters	Syntax	Response
user_name	pducli -> get user_name.x	pducli -> user_name.x=yyyy (yyyy= UserName for x)

Parameters	Syntax	Response
	(x= User-Number from 1-5)	
user_accessright	pducli -> get accessright.x	pducli -> accessright.x=y(1= User, 2=Admin for User x)
	(x= UserName-Number from 1-5)	
user_snmpv3_name	pducli -> get user_snmpv3_name.x	pducli -> user_snmpv3_name.x=yyyy (yyyy= SNMPv3-UserName for SNMPv3- User x)
	(x=SNMPv3-User-Number from 1-10)	
user_snmpv3_security_level	pducli -> get user_snmpv3_name.x	pducli -> user_snmpv3_name.x=y (0= No Auth/No Priv, 1= Auth/No Priv, 2= Auth/Priv for SNMPv3- User x)
	(x= SNMPv3-User-Number from 1-10)	
user_snmpv3_auth_alg	pducli -> get user_snmpv3_auth_alg.x	pducli -> user_snmpv3_auth_alg.x=y (0= MD5, 1= SHA, SNMPv3-User)x
	(x= SNMPv3-User-Number from 1-10)	
user_snmpv3_priv_alg	pducli -> get user_snmpv3_priv_alg.x	pducli -> user_snmpv3_priv_alg.x =y (0= DES, 2= AES, 3= AES192, 4= AES256, for SNMPv3- User x)
	(x = SNMPv3-User-Number from 1-10)	
user_snmpv3_accessright	pducli -> get user_snmpv3_accessright.x	pducli -> user_snmpv3_priv_password.x =yyyy (0=readonly, 1=readwrite for SNMPv3- User x)
	(x= SNMPv3-User-Number from 1-10)	
user_snmpv3_enable	pducli -> get user_snmpv3_enable.x	pducli -> user_snmpv3_enable.x =0n (or <i>user_snmpv3_enable.x</i> =Off for SNMPv3- User x)
	(x= SNMPv3-User-Number from 1-10)	

System Time Configuration Parameters

Note - Enabling Daylight Saving Time will add an hour to the previously set time. The time will not automatically return to Standard Time when Daylight Saving Time ends. Set the `system_dst_enable` parameter to Off to disable this setting once Daylight Saving Time ends for your location.

TABLE 45 System Time Configuration Parameters (get Command) Available Starting with FW 2.02

Parameters	Syntax	Response
system_manual_date	pducli -> get system_manual_date	pducli -> system_manual_date =yyyy-mm-dd (yyyy= year, mm= month, dd= day)
system_manual_time	pducli -> get system_manual_time	pducli -> system_manual_time=hh:mm:ss (hh= hour, mm= minutes, ss= seconds)
system_ntp_server_enable	pducli -> get system_ntp_server_enable	pducli -> system_ntp_server_enable=0n

Parameters	Syntax	Response
systemtime_ntp_server	pducli -> get systemtime_ntp_server	(or systemtime_ntp_server_enable=Off) pducli -> systemtime_ntp_server=xxxx (xxxx= NTP-Server)
systemtime_ntp_server_timezone	pducli -> get systemtime_ntp_server_timezone	pducli -> systemtime_ntp_server_timezone=xx (xx=index to Timezone-Table; 0-77 allowed. See also WebConfiguration)
systemtime_ntp_server_poll_interval	pducli -> get systemtime_ntp_server_poll_interval	pducli -> systemtime_ntp_server_poll_interval=xx (xx= Poll-Interval in hours: 1-24 allowed)
systemtime_ntp_server_last_sync	pducli -> get systemtime_ntp_server_last_sync	pducli -> systemtime_ntp_server_last_sync=yyyy-mm-dd hh:mm:ss (yyyy= year, mm= month, dd= day, hh= hours, mm= minutes, ss= seconds)
systemtime_current_pdu_time	pducli -> get systemtime_current_pdu_time	pducli -> systemtime_current_pdu_time=yyyy-mm-dd hh:mm:ss (yyyy= year, mm= month, dd= day, hh= hours, mm=minutes, ss= seconds)
systemtime_dst_enable	pducli -> get systemtime_dst_enable	pducli -> systemtime_dst_enable=0n (or set systemtime_dst_enable=Off)

TABLE 46 System Time Configuration Parameters (set Command) Available Starting with FW 2.02

Parameters	Syntax	Response
systemtime_manual_date	pducli -> set systemtime_manual_date=yyyy-mm-dd (yyyy= year, mm= month, dd= day)	pducli-> set OK (or an error message)
systemtime_manual_time	pducli -> set systemtime_manual_time=hh:mm:ss (hh= hour, mm= minutes, ss= seconds)	pducli-> set OK (or an error message)
systemtime_ntp_server_enable	pducli -> set systemtime_ntp_server_enable=0n (or set systemtime_ntp_server_enable=Off)	pducli-> set OK (or an error message)
systemtime_ntp_server	pducli -> set systemtime_ntp_server=xxxx (xxxx= NTP-Server)	pducli-> set OK (or an error message)
systemtime_ntp_server_timezone	pducli -> set systemtime_ntp_server_timezone=xx (xx=index to Timezone-Table; 0-77 allowed. See also WebConfiguration)	pducli-> set OK (or an error message)
systemtime_ntp_server_poll_interval	pducli -> set systemtime_ntp_server_poll_interval=xx (xx= Poll-Interval in hours: 1-24 allowed)	pducli-> set OK (or an error message)

Parameters	Syntax	Response
systemtime_dst_enable	pducli-> set systemtime_dst_enable=0n (or Off)	pducli-> set OK (or an error message)

The following table shows the timezones and their corresponding numeric values:

- 0: (GMT) UTC
- 1: (GMT-12:00) International Date Line West
- 2: (GMT-11:00) Midway Island, Samoa
- 3: (GMT-10:00) Hawaii-Aleutian Time
- 4: (GMT-09:00) Alaskan Time
- 5: (GMT-08:00) Pacific Time (US and Canada); Tijuana
- 6: (GMT-07:00) Arizona
- 7: (GMT-07:00) Mountain Time (US and Canada)
- 8: (GMT-07:00) Chihuahua, La Paz, Mazatlan
- 9: (GMT-06:00) Central America Time
- 10: (GMT-06:00) Central Time (US and Canada)
- 11: (GMT-06:00) Guadalajara, Mexico City, Monterrey
- 12: (GMT-06:00) Saskatchewan
- 13: (GMT-05:00) Bogota, Lima, Quito
- 14: (GMT-05:00) Eastern Time (US and Canada)
- 15: (GMT-05:00) Indiana (East)
- 16: (GMT-04:00) Atlantic Time (Canada)
- 17: (GMT-04:00) Caracas, La Paz
- 18: (GMT-04:00) Santiago
- 19: (GMT-03:30) Newfoundland
- 20: (GMT-03:00) Brasilia
- 21: (GMT-03:00) Buenos Aires, Georgetown
- 22: (GMT-03:00) Greenland
- 23: (GMT-02:00) Mid-Atlantic
- 24: (GMT-01:00) Azores
- 25: (GMT-01:00) Cape Verde Island
- 26: (GMT) Casablanca, Monrovia
- 27: (GMT) Dublin, Edinburgh, Lisbon, London
- 28: (GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm
- 29: (GMT+01:00) Belgrade, Bratislava, Budapest, Ljubljana
- 30: (GMT+01:00) Brussels, Copenhagen, Madrid, Paris
- 31: (GMT+01:00) Sarajevo, Skopje, Warsaw, Zagreb
- 32: (GMT+01:00) West Central Africa
- 33: (GMT+02:00) Athens, Istanbul, Minsk
- 34: (GMT+02:00) Bucharest
- 35: (GMT+02:00) Cairo
- 36: (GMT+02:00) Harare, Pretoria
- 37: (GMT+02:00) Helsinki, Kyiv, Riga, Sofia, Tallinn, Vilnius
- 38: (GMT+02:00) Jerusalem
- 39: (GMT+03:00) Baghdad
- 40: (GMT+03:00) Kuwait, Riyadh

41: (GMT+03:00) Nairobi
42: (GMT+03:30) Tehran
43: (GMT+03:00) Moscow, St. Petersburg, Volgograd
44: (GMT+04:00) Abu Dhabi, Muscat
45: (GMT+04:00) Baku, Tbilisi, Yerevan
46: (GMT+04:30) Kabul
47: (GMT+05:00) Ekaterinburg
48: (GMT+05:00) Islamabad, Karachi, Tashkent
49: (GMT+05:30) Chennai, Kolkata, Mumbai, New Delhi
50: (GMT+05:45) Kathmandu
51: (GMT+06:00) Almaty, Novosibirsk
52: (GMT+06:00) Astana, Dhaka
53: (GMT+06:00) Sri Jayawardenepura
54: (GMT+06:30) Rangoon
55: (GMT+07:00) Bangkok, Hanoi, Jakarta
56: (GMT+07:00) Krasnoyarsk
57: (GMT+08:00) Beijing, Chongqing, Hong Kong, Urumqi
58: (GMT+08:00) Irkutsk, Ulaan Bataar
59: (GMT+08:00) Kuala Lumpur, Singapore
60: (GMT+08:00) Perth
61: (GMT+08:00) Taipei
62: (GMT+09:00) Osaka, Sapporo, Tokyo
63: (GMT+09:00) Seoul
64: (GMT+09:00) Yakutsk
65: (GMT+09:30) Adelaide
66: (GMT+09:30) Darwin
67: (GMT+10:00) Brisbane
68: (GMT+10:00) Canberra, Melbourne, Sydney
69: (GMT+10:00) Guam, Port Moresby
70: (GMT+10:00) Hobart
71: (GMT+10:00) Vladivostok
72: (GMT+11:00) Magadan
73: (GMT+11:00) Solomon Islands, New Caledonia
74: (GMT+12:00) Auckland, Wellington
75: (GMT+12:00) Kamchatka, Anadyr
76: (GMT+12:00) Fiji Islands, Kamchatka, Marshall Islands
77: (GMT+13:00) Nuku'alofa

Servicing PDUs

Perform these tasks when servicing PDUs.

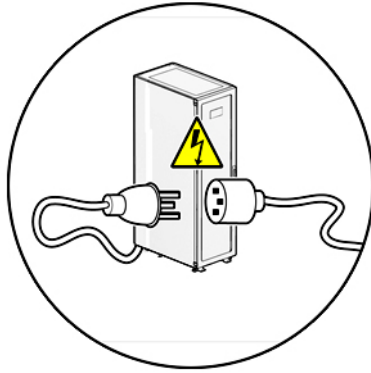
Description	Links
Replace a PDU.	“Disconnect the Main Input Power Cords From the Power Source” on page 155 “Remove a PDU” on page 156 “Installing PDUs” on page 31

▼ Disconnect the Main Input Power Cords From the Power Source

Note - Refer to the service manuals of the equipment installed in the rack for the proper PDU replacement procedures, if applicable.

1. **Prepare for services as you would for installation.**

See [“Preparing for Installation”](#) on page 25.



2. **Disconnect the power cords.**

3. **Remove a PDU.**

To remove a PDU, see [“Remove a PDU”](#) on page 156.

▼ Remove a PDU

Note - Refer to the service manuals of the equipment installed in the rack for the proper PDU replacement procedures, if applicable.

1. **Shut down and power off the equipment installed in the rack.**

Refer to the system and equipment documentation for the proper shut down and power off procedures.

2. **Open the rear door of the rack.**

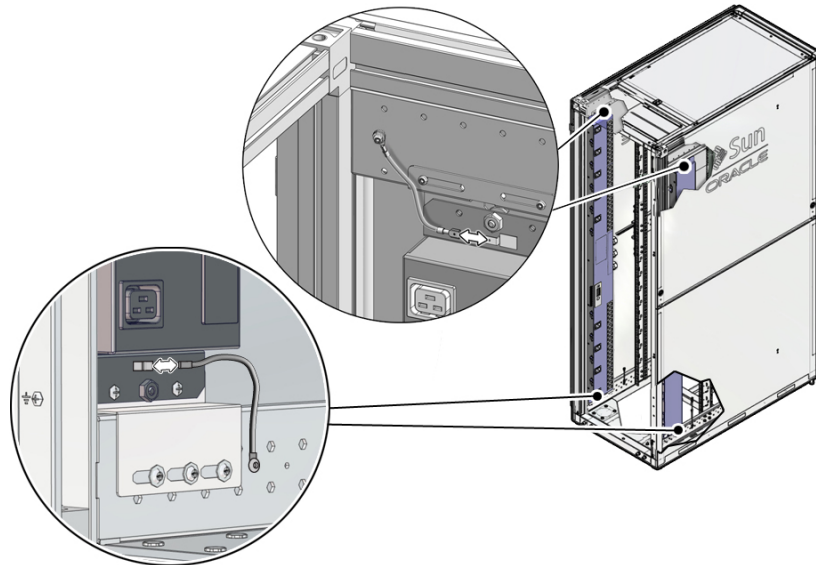
3. **Attach a wrist strap to your wrist and to an ESD grounding jack on the rack.**

See [“Attach an Antistatic Wrist Strap”](#) on page 28.

4. **Switch off all of the PDU circuit breakers in the rack.**

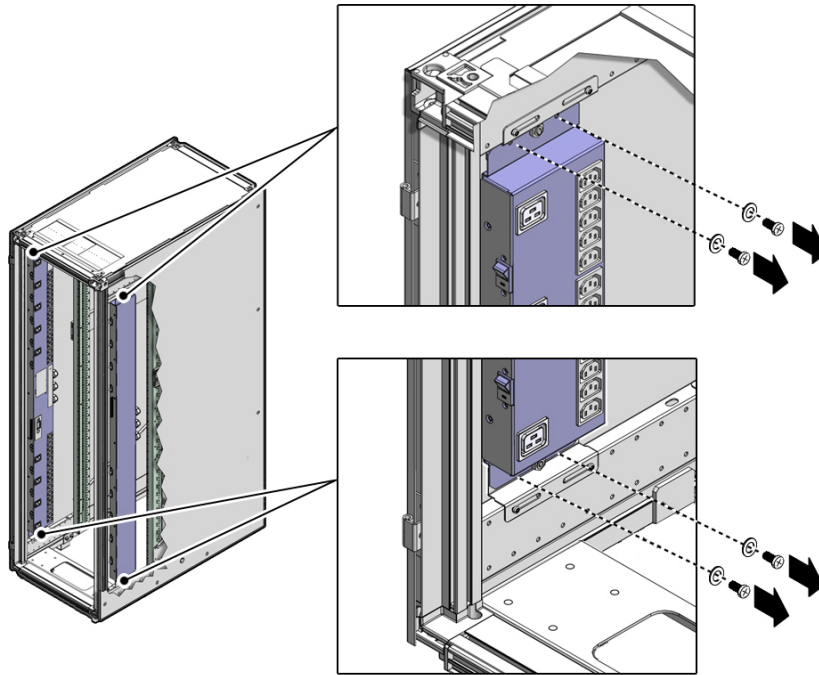
Press down on the Off (0) toggle switch to power off the PDU. These circuit breakers are at the rear of the rack cabinet. See [“Circuit Breaker Locations”](#) on page 38.

5. **Disconnect the PDU's main power lead cords from the AC power source.**
See [“Disconnect the Main Input Power Cords From the Power Source”](#) on page 155.
6. **Disconnect any power jumper cords connected to the PDU from equipment in the rack.**
Note where these jumper cords were attached to the PDU.
7. **Cut any tie-wraps securing the PDU power input lead cords to the tie-down brackets.**
8. **Disconnect the grounding strap connecting the top of the PDU to the rack.**



9. **If the rack included a factory-installed PDU, use a T-25 wrench key to remove the four M5 screws and washers securing the PDU to the mounting brackets.**

These screws secured the PDU for shipping purposes. You might have already removed these screws when you installed the rack at the installation site.



10. **Carefully lift the PDU up and off the mounting brackets. Remove the PDU from the rack and place it on a clean work table.**
11. **Install a new PDU.**
See [“Installing PDUs” on page 31.](#)

Glossary

C

Compact PDU Compact power distribution unit.

D

DHCP Dynamic Host Configuration Protocol.

DST Daylight saving time.

I

IPv4 Internet Protocol version 4.

IPv6 Internet Protocol version 6.

N

NMS Network management station.

O

Oracle ILOM Oracle Integrated Lights Out Manager.

P

PDU Power distribution unit. There are three types of PDUs, compact PDU, standard original PDU, and standard enhanced PDU.

S

SNMP Simple Network Management Protocol.

SR11 Oracle Rack 1242.

standard PDU Standard power distribution unit. There are two types of standard PDUs, original PDU and enhanced PDU.

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