POWER INNOVATIONS INTERNATIONAL

LITEON GROUP

MGX Inverter Shelf
Models:
PF-2662-P20N

Operation Manual

MNL230

Revision: 1.1

READ THIS MANUAL CAREFULLY
SAVE ALL INSTRUCTIONS

This manual contains important information regarding Power Innovations International (Pii) products or processes listed on the title page. Please read all instructions carefully before assembling, installing, or operating equipment. Keep this manual handy for easy reference.

This manual may accompany other instructional guides or manuals for standard installation and operations of the supported products. Please contact Pii if you need additional guides or manuals and have not received them.

Contents

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1 - Introduction

This user manual is based on the engineering specification PF-2662-P20N. It includes installation and operation instructions for the 6.6 kW Inverter Shelf System.

2 - System Description

The PF-2662-P20N Inverter Shelf is a 6.6 kW, 240 Vac output power system designed to power accessory equipment for data processing racks. It supports full redundancy when configured independently parallel and integrates inverters, DC/DC converters, signal interfaces, and AC connectors.

Input rating:
- DC, 42 to 60 VDC, Bizlink Connector PN: 747-BL01B6S8BNB3Y2006, 50-60 Hz, 170 A max

Output rating:
- AC, 240 Vac, C19 receptacle, 50-60 Hz, 28 A per shelf or 14 A per inverter max

Power Shelf:
- The power shelf houses two (2) inverters and two (2) DC/DC converter units. The system is capable of full redundancy when configured in parallel. Each shelf in the system also houses the controller.

PMC:
- The PMC is a power monitoring controller, which collects module signals and report the collected data to an external management unit as an ethernet server. It is connected to the modules in the shelf through the system back board and connected to the centralized system through the front RJ45 connector.

Inverters:
- The system contains two inverters (IM-2332-01P1-DC) which provide load power and during normal operating conditions.

DC/DC Converters:
- The system contains two DC/DC converters (DD-2352-02P1-LF) which take input from the main rack bus and provide voltage adjusted power to the inverters.

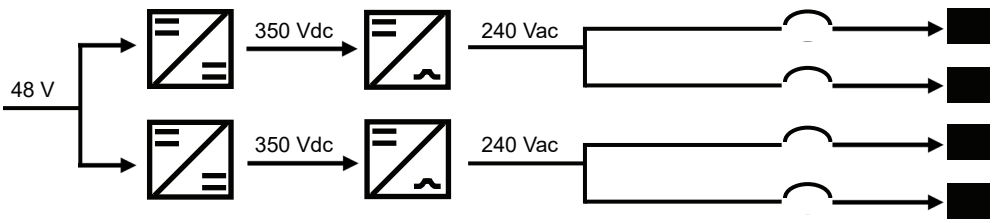


Figure 2.1 - Pii power shelf overview illustration

3 - Power Shelf: Installing the System

Ensure proper alignment with input busbars and secure the shelf using mounting levers.

3.1. Acceptance Checklist

This section contains the Acceptance Checklist, designed to ensure the system is properly installed and ready for initial operation. As you complete each procedure outlined in this document, check the corresponding box. If a procedure does not apply to your installation site, still check the box to indicate that you have reviewed it. Once installation is complete, verify that every item on the checklist has been marked. Note that some procedures may have already been completed at the factory.

Making Electrical Connections

- 50 VDC Input Connection Made
- AC Output Connections Made & Secured

Installing the PSUs and PMC

- 2 pcs Inverters installed as required
- 2 pcs DC/DC Converters installed as required
- 1 pcs PMC (CM-14MP-1-R) installed as required

Power shelf starting up and operation checking

- Preparation for power up and operation checking

3.2. Checking the Equipment

1. Check the packing slip to make sure all components ordered were received. Report any missing items to the carrier and your local sales representative immediately.
2. Inspect the equipment and shipping container(s) for any signs of damage or mishandling.
3. As the equipment is unpacked, visually examine the system for transit damage.
4. Do not attempt to install the system if damage is apparent.
5. If any damage is noted, follow local practices for reporting and handling damaged goods.

3.3. Installing the Bracket Kit and Power Shelf into a Rack

There are two types of brackets that can be installed on 19-inch and 21-inch racks.

3.3.1. Installing the brackets into a 19-inch rack

Install rack brackets kit into a 19-inch frame of a rack as follows. Refer to Figure 3.1, Figure 3.2, and Figure 3.3 as this procedure is performed.

Procedure

1. Use a Phillips screwdriver to remove the mounting screws from the bracket.
2. Align the positioning screws on the bracket with the mounting holes on the rack, and insert the bracket.
3. Align the other side of the bracket with the mounting holes on the rack, and insert it.
4. Reinstall the mounting screws onto the bracket to secure the shelf to the rack.

Item	Description
1	PF-2662-P20N - Power Shelf
2	M6 Mounting Hardware
3	KE-0001-015N Rails

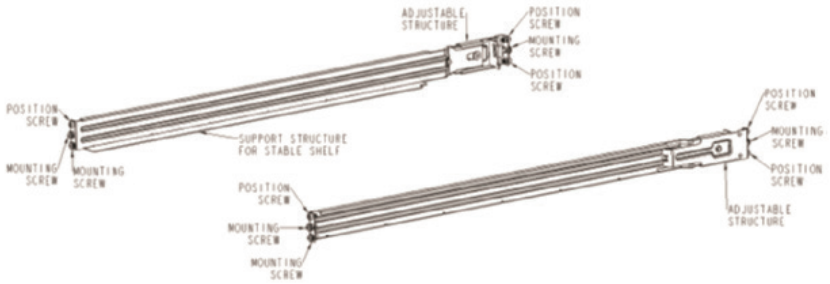
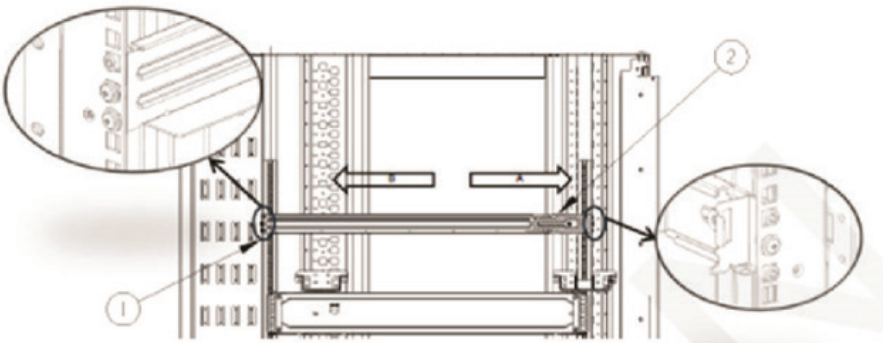
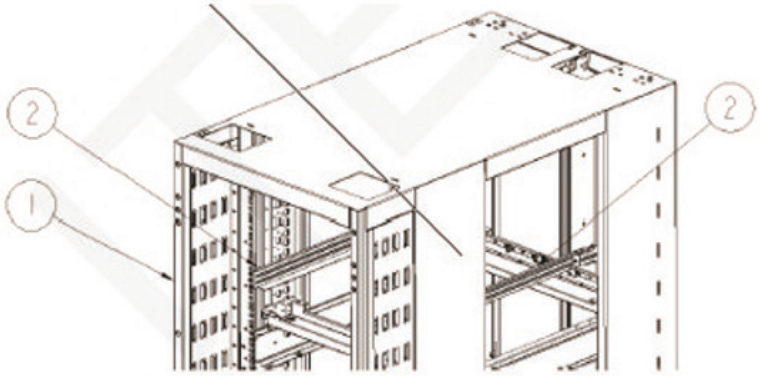


Figure 3.1 - KE-0001-015N Rails



Item	Description
1	Fix structure of rack
2	Position of brackets

Figure 3.2 - Brackets



Item	Description
1	Rack
2	Brackets

Figure 3.3 - Brackets

3.3.2. Installing the power shelf into a 19-inch rack

Procedure

1. Insert the Power shelf into the front of the rack, resting the bottom of the Power shelf on the rack brackets.
2. Confirm the power shelf DC input clip with the DC busbar set in the rear of the rack.

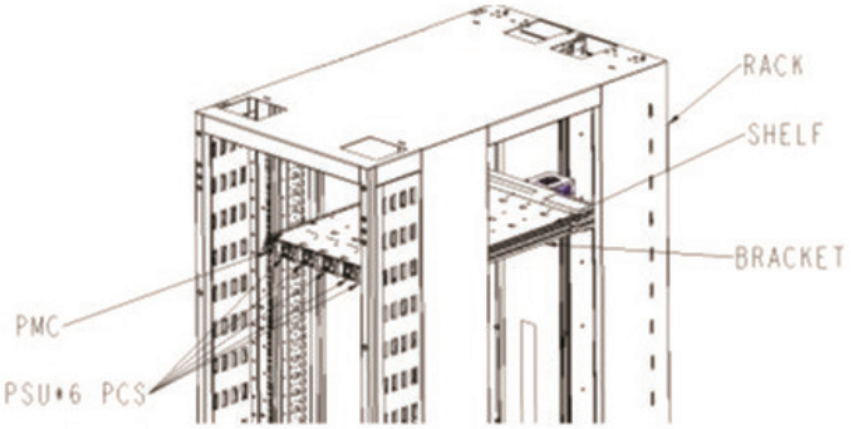


Figure 3.4 - Install the 19-inch power shelf into the 19-inch rack

3.3.3. Installing the brackets kit and power shelf into a 21-inch rack

Install the brackets kit into a 21-inch frame of a rack as follows. Refer to Figure 3.6 as this procedure is performed.

Item	Description
1	PF-2662-P20N - Power Shelf
2	MT03146 - 21” ORV3 Power Shelf Rail Kit, 1OU
3	KE-0001-014N – 19-21” Adapter Tray and Shelf Hardware

Procedure

1. Set the left and right bracket onto the corresponding holes in the rack.
2. Insert the Power shelf into the front of the Adapter Tray, resting the bottom of the Power shelf on the tray as shown in Figure 3.7.
3. Slide all the way in and fix screw between the bracket and shelf in location shown in Figure 3.8.
4. Slide the combined Adapter Tray and Shelf assembly into the 21” support brackets. Confirm the power shelf DC input clip with the DC busbar set in the rear of the rack.

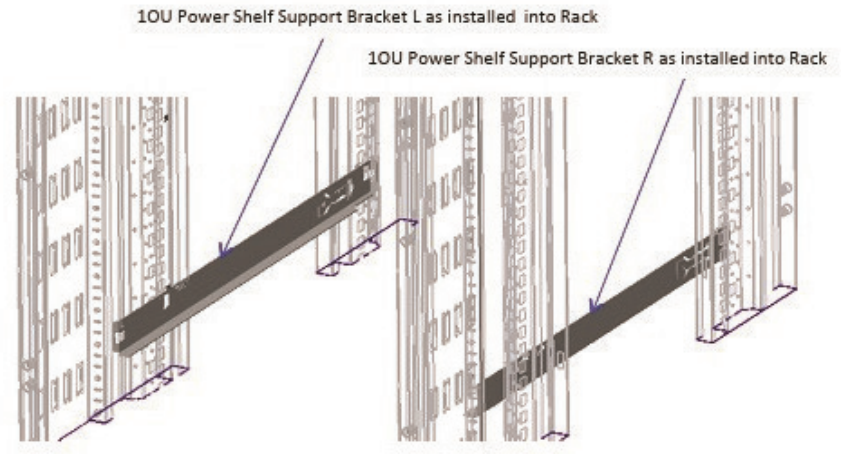


Figure 3.5 - Installing 21” brackets kit

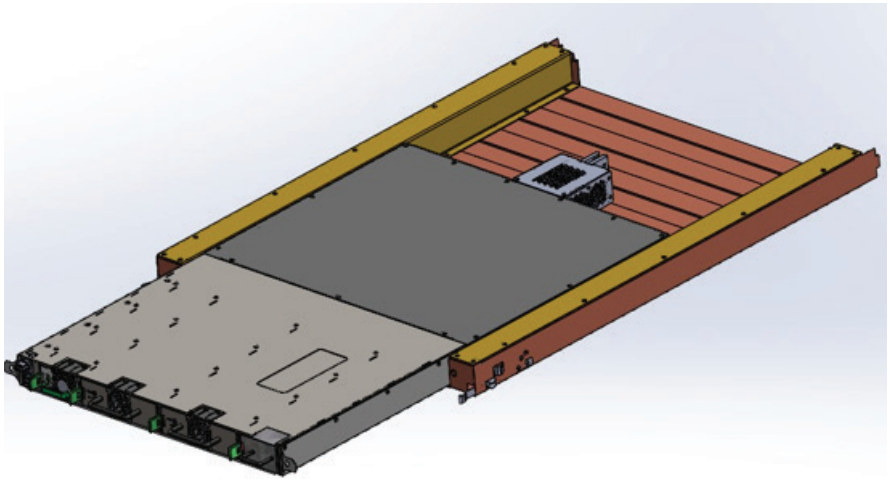


Figure 3.6 - Shelf sliding into adapter tray

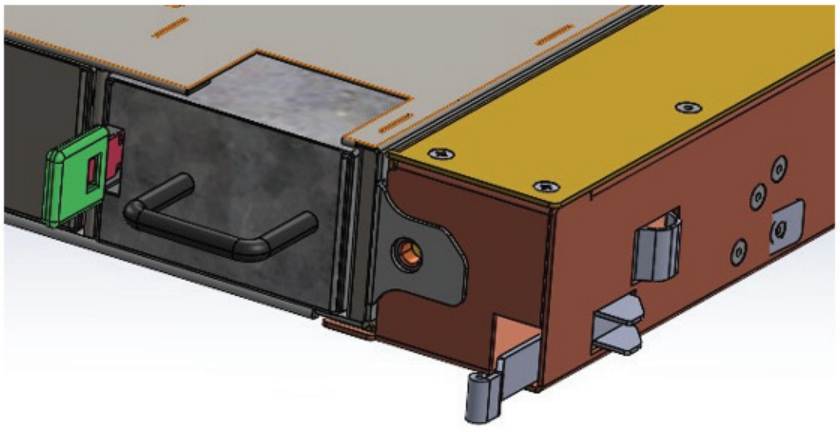


Figure 3.7 - Fasten with provided M6 mounting hardware through front hole

4 - Making Electrical Connections

Connect DC input to DC busbar. Connect AC outputs using properly secured connectors.

4.1. Acceptance Checklist

DC input is provided via a DC input connector located on the back of the Power shelf as shown in Figure 4.1. This connector is compatible with the vertical DC busbar set in a rack.

4.2. AC Output and AC Output Equipment

The Power shelf is designed to accommodate (4) 240 Vac C19 receptacles, two receptacles for one inverter output and two receptacles for the second inverter output. Each receptacle has a 20 A circuit breaker for overcurrent protection. See Figure 4.1.

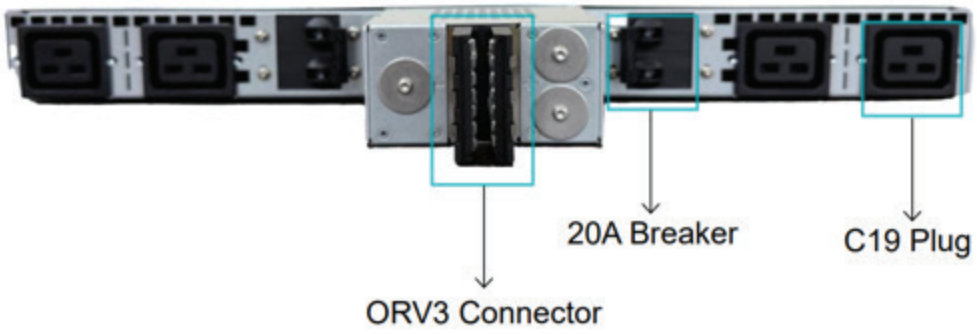


Figure 4.1 - 50 VDC input & AC Output Connectors

4.2.1. Safety Accessory Installation

When making connections into C19 receptacles, please utilize accessory cable ties in the following method.

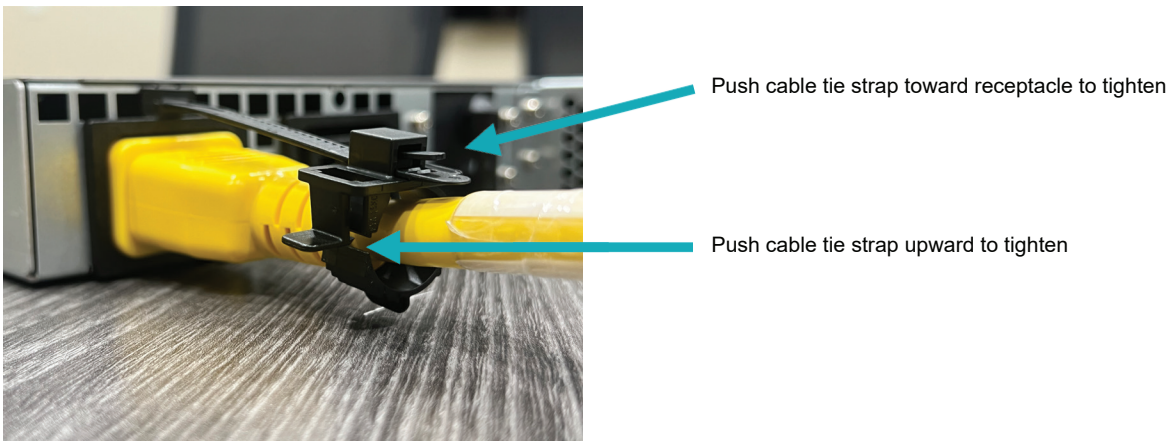


Figure 4.2 - Accessory Cable Tie Installation

4.3. Controller Front Panel RJ45 Connector

In the front of the PMC, there is a single RJ45 connector and a button. This is a RJ45 with two LEDs. RJ45 Port includes electrical connections for Ethernet communications. Communication with rack monitored via Ethernet. This denoted button is used to reset the PMC function.

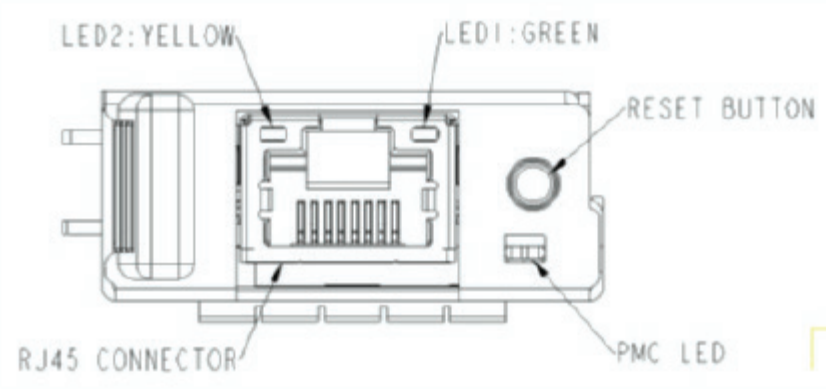


Figure 4.3 - RJ45 Connector

PIN# / LED	Description	
1	A+	
2	A-	
3	B+	
4	C+	
5	C-	
6	B-	
7	D+	
8	D-	
Green	OFF	Link off
	ON	Link on (any speed)

Table 4.1 - RJ-45 Pin Configuration

4.3.1. Controller Indicator Light

There are two LED indicator lights, for the details please refer to the following table:

LED Name	Color	Description
LED1	Green	Indicates Power Status of the PMC
LED2	Yellow	Indicates that a fault has occurred

Table 4.2 - LED Indicator Definition

4.3.2. Controller Power Input/Output

Power input:

- Voltage: 12 V to 54 V (DC)
- Current: 0.2 A (Rating)

5 - Installing the Inverters, DC/DC Converters and PMC Units

Insert inverter and DC/DC converter units into designated slots and secure with latch. PMC module should be installed similarly. Ensure EEPROM FRU is present and readable. Verify LED indicators for operational status.

5.1. Installing Inverters

1. Unpack the Inverter.
2. Partially insert the inverter into the mounting shelf.
3. Push the spring latch handle on the front of the inverter to the right to retract the securing latch located on the side of the unit.
4. Fully slide the inverter into the shelf and release the spring latch handle. The securing latch will automatically engage with a notch in the shelf, locking the inverter in place.
5. When all inverters are installed in their respective shelves, they are ready for immediate operation once power is supplied.
6. If the system is operating, ensure that there are no local or remote alarms active on the system.

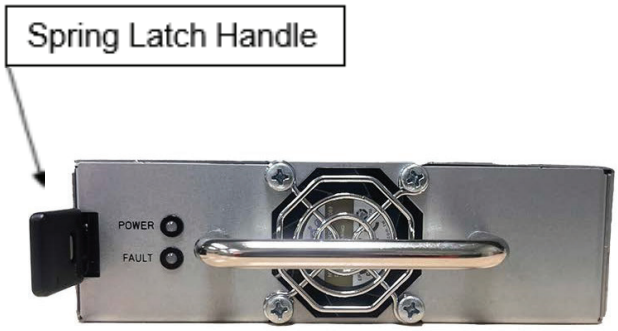


Figure 5.1 - Installing inverter

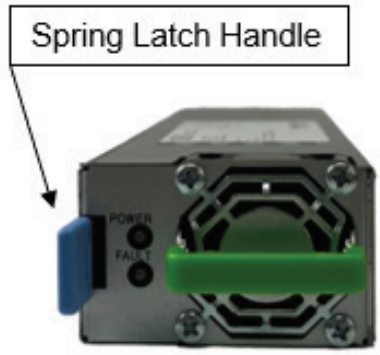


Figure 5.2 - Installing DC/DC

5.2. Installing the DC/DC Converter modules

1. Unpack the DC/DC Converter module.
2. Partially insert the DC/DC Converter module into the mounting shelf.
3. Push the spring latch handle on the front of the DC/DC Converter module to the right to retract the securing latch located on the side of the unit.
4. Fully slide the DC/DC Converter module into the shelf and release the spring latch handle. The securing latch will automatically engage with a notch in the shelf, locking the DC/DC Converter module in place.
5. Flip handle downwards to ensure proper airflow through modules.
6. When all modules are installed in their respective shelves, they are ready for immediate operation once power is supplied.
7. If the system is operating, ensure that there are no local or remote alarms active on the system.

5.3. Installing the PMC

1. Unpack the Power Management Controller (PMC).
2. Partially insert the PMC into the shelf.
3. Push the spring latch handle on the front of the PMC to the right to retract the securing latch located on the side of the unit.
4. Fully slide the PMC into the shelf and release the spring latch handle. The securing latch will automatically engage with a notch in the shelf, locking the PMC in place.
5. If the system is operating, wait for the PMC to complete its boot process and verify that the system is functioning normally.
6. If the system is operating, ensure that there are no local or remote alarms active on the system.

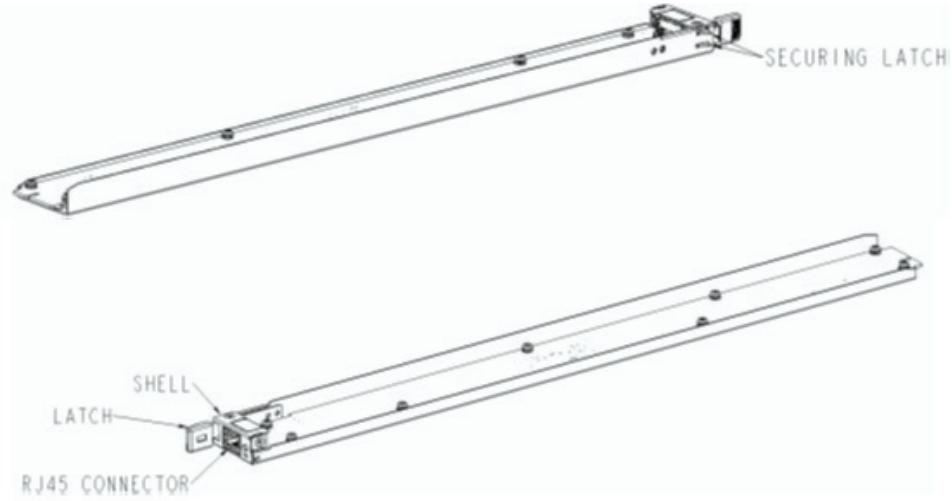


Figure 5.3 - Installing controller

6 - Power Shelf Starting Up and Operation Checking

Apply DC power and monitor Inverters, DC/DC Converters modules and PMC indicators. Use SYNC_START signal for coordinated startup. Confirm Ethernet communication.

6.1. Preparation for Power-Up

1. Check out Inverter, DC/DC Converter, PMC, busbar and power shelf installing on the rack.
2. Measure input voltage matched the spec requirement.

6.2. Operation Checking

1. When the DC input is on, DC/DC modules are waiting for a Sync Start signal and module's indicator LED1 is blinking green at 2Hz.
2. When the DC input is on, inverters are waiting for a Sync Start signal and inverter's indicator LED1 is blinking green at 2Hz.
3. DC/DC Converter units normally turn on, the DC/DC Converter indicator LED1 is solid green.
4. Inverters normally turn on, the Inverter indicator LED1 is solid green.
5. PMC card will turn on.
6. Confirm there are no alarms.

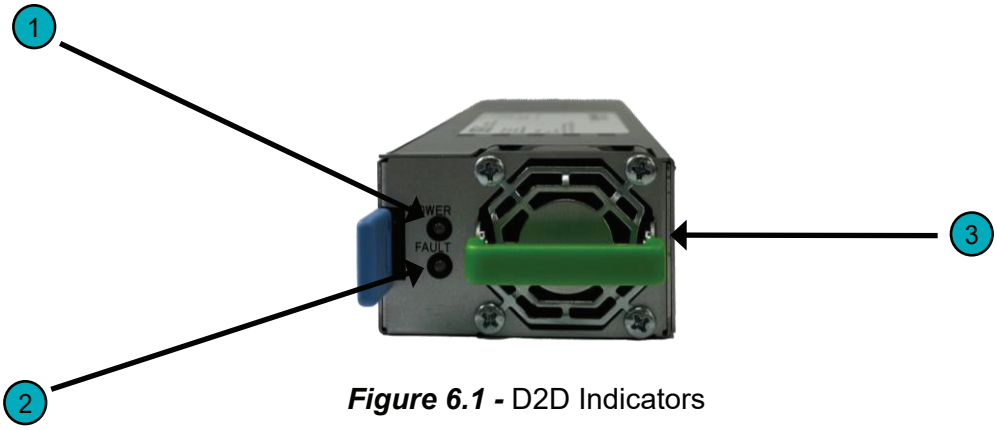
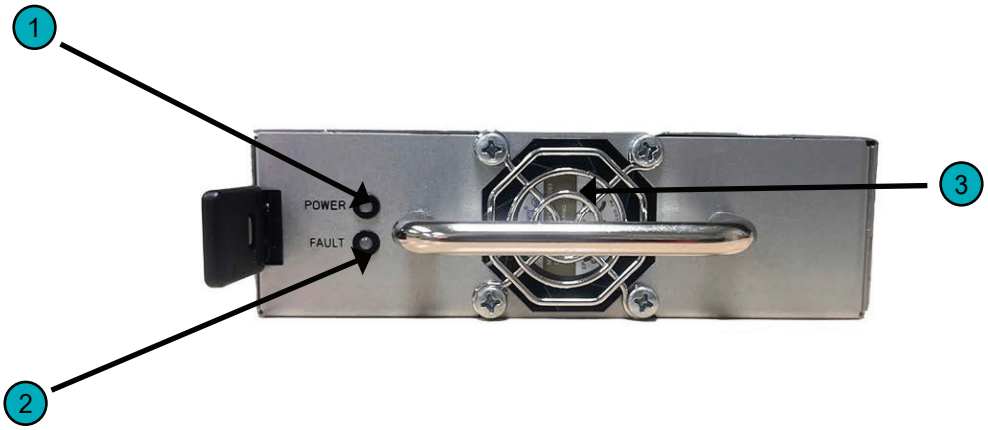


Figure 6.1 - D2D Indicators

1	"POWER" LED	Output power indicator: green-colored LED
2	"FAULT" LED	PSU fault indicator: amber-colored LED
3	Fans	Cooling fans

Status	LED Green: Power	LED Amber: FAULT
Output Normal	**Solid Green**	Off
Storage Temperature	**Blinking Green @ 2 Hz**	Off
Output Disable/Fault	Off	**Solid Amber**
Output Disable/Firmware Update	Off	**Blinking Amber @ 2 Hz**

Table 6.1- D2D LED1 and LED2 Indicators

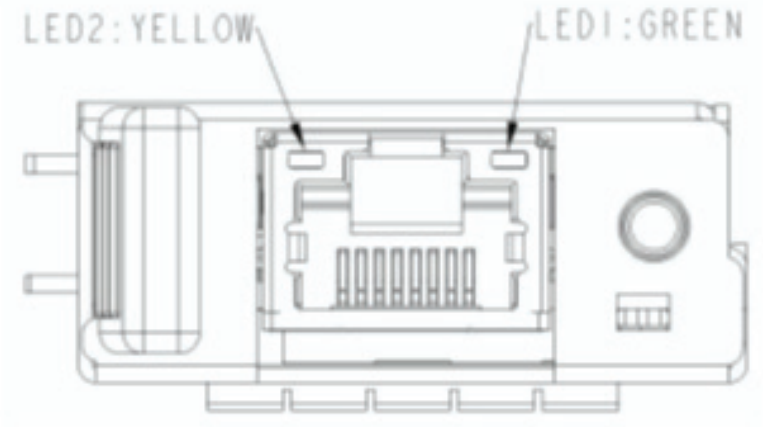


1	“POWER” LED	Output power indicator: green-colored LED
2	“FAULT” LED	PSU fault indicator: amber-colored LED
3	Fans	Cooling fans

Figure 6.2 - D2D Indicators

Status	LED Green: Power	LED Amber: FAULT
Output Normal	**Solid Green**	Off
Storage Temperature	**Blinking Green @ 2 Hz**	Off
Output Disable/Fault	Off	**Solid Amber**
Output Disable/Firmware Update	Off	**Blinking Amber @ 2 Hz**

Table 6.2- D2D LED1 and LED2 Indicators



*For the LED indicator definition, please refer to Table 4.1.

Figure 6.2- PMC Indicator

7 - Safety and Specifications

The following safety instructions apply throughout the Power Shelf and Module installation process. Be familiar with them before moving on to the next section to complete the installation.

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

ELECTRICAL WARNINGS – WARNING! RISK OF ELECTRIC SHOCK!

WARNING! RISK OF ELECTRIC SHOCK! ONLY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THIS TYPE OF EQUIPMENT AND THE HAZARDS INVOLVED SHOULD ADJUST, MODIFY, AND SERVICE THIS EQUIPMENT. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE INJURY OR DEATH.

WARNING! RISK OF ELECTRIC SHOCK! READ THIS MANUAL THOROUGHLY PRIOR TO INSTALLING AND ENERGIZING THE EQUIPMENT. INSPECTION AND MAINTENENACE OF THIS EQUIPMENT SHOULD BE PERFORMED IN ACCORDANCE WITH THE PROCEDURES DETAILED IN THIS MANUAL.

WARNING! RISK OF ELECTRIC SHOCK! THIS UNIT CONTAINS NO INTERIOR PARTS THAT CAN BE SERVICED WITHOUT QUALIFIED PERSONNEL. IF MAINTENANCE PROCESSES SPECIFIED IN THIS MANUAL FAIL TO SOLVE THE PROBLEM, QUALIFIED PERSONNEL MUST SERVICE THE UNIT.

WARNING! RISK OF ELECTRIC SHOCK! THE PURPOSE OF THIS MANUAL IS TO PROVIDE YOU WITH INFORMATION NECESSARY TO SAFELY INSTALL, OPERATE, AND MAINTAIN THIS EQUIPMENT. KEEP THIS MANUAL FOR FUTURE REFERENCE.

WARNING! RISK OF ELECTRIC SHOCK! SHUT OFF POWER SUPPLY BEFORE BEGINNING INSTALLATION ACTIVITIES OR MAINTENANCE WORK. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE INJURY OR DEATH.

WARNING! RISK OF ELECTRIC SHOCK! THIS EV FAST CHARGER CONTAINS HIGH VOLTAGE POWER THAT IS POTENTIALLY DANGEROUS IF NOT HANDLED PROPERLY.

CAUTION!
The installer is responsible for conforming to all local and national electrical codes and standards applicable in the jurisdiction this equipment is installed in.

8 - Regulatory Information

This product and its documentation comply with the following UL Standards:

- **IEC 62368-1 Standard for Safety**: Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements

9 - Warranty

Power Innovations International warrants that products purchased hereunder are free and clear of all liens and encumbrances.

Power Innovations International warrants that products are to be free from material or workmanship defect under normal use for a period of two (2) years from the invoice date.

In the event that any defect is found under normal usage conditions during the above warranty period, Power Innovations International will be responsible for repair or replacement at its sole discretion and subject to the replacement may be refurbished products.

All repair covered by this warranty must be done at Power Innovations International factory, or other repair facilities as designated by Power Innovations International unless Power Innovations International specifically directs that this service be performed at another location or service provider.

Customer shall, at its own costs, be responsible for shipping the defective products to the designated repair facilities subject to a RMA issued by Power Innovations International.

Power Innovations International will be responsible for shipping the repaired or refurbished unit back to the customer.

Power Innovations International shall not have any warranty obligations for claims: (i) caused by the misuse or abuse of products by end users; (ii) caused by modifications or repairs made to the products or disassembly of products by any person other than Power Innovations International, unless receiving Power Innovations International authorization; (iii) in relation to the appearance damage.

This Warranty Term states the exclusive liability of Power Innovations International and the exclusive remedy of buyer/customer with respect to any claim or defects of the products.

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10 - Contact Information

If there are any questions or comments about this product, please feel free to contact us.

Power Innovations International, Inc.

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