IPS-1201

12-Outlet Intelligent Power Distribution Unit

Version 1.0

Preface

About this Manual

Congratulations on purchasing the PDU III. This user manual provides detailed descriptions of the hardware components and how to use the PDU III. Read this manual carefully and follow the instructions while using the PDU III.

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Safety Instructions

Follow these safety instructions to avoid injury to self and damage to the PDU III.

- To reduce the risk of fire or electric shock, install the unit in a temperature-controlled indoor area free of conductive contaminants. Do not place the unit near liquids or in an excessively humid environment.
- Do not allow liquids or foreign objects to enter the unit.
- The unit does not contain any user-serviceable parts. Do not open the unit.
- Servicing, maintenance, and repair for this equipment must be performed by qualified service personnel. Remove rings, watches and other jewelry before servicing the unit.
- Before maintenance, repair or shipment, the unit must be completely switched off and unplugged and all connections must be removed.
- Before plugging in the power cord of the device, make sure that the power source rating matches the power rating of the PDU III.
- Use a standard power cord when connecting any device to the outlets of PDU III.
- The digital output only can connect switches, indicators, or other output devices that are normally open or normally closed.

Safety Notices

⚠️	**Caution:** This unit has been provided with a real time clock circuit. There is a danger of explosion if the battery is incorrectly replaced. Replace only with a 3V Lithium cell (CR2032) or equivalent type. Discard used batteries according to the manufacturer's instructions.

⚠️	**Caution:** Rack-Mounted Equipment – The unit is intended to be rack-mounted, the Installation Instructions shall contain wording to address the following concerns when the unit is mounted in a rack system. A. "The equipment is to be installed in an environment with maximum ambient temperature must not exceed 50°C." B. "The openings on the enclosure are for air convection hence protected the equipment from overheating. DO NOT COVER THE OPENINGS." C. "Lay this equipment on a reliable surface when install. A drop or fall could cause injury." D. "The equipment shall be installed according to specification as nameplate. Make sure the voltage of the power source when connect the

| | | equipment to the power outlet. The current of load and output power of loads shall be not over the specification." |
| | | E. "This equipment must be connected to the reliable earth before using." |

Table of Content

Introduction the PDU III

Congratulations on purchasing the PDU III, an intelligent power management system. The PDU III is designed to measure the input and individual outlet current consumption and auto email history report to supervisor for power bill charge. At the same time, the PDU III provides the useful ability of managing power for any combination of network equipment connected to it. User can control the power on/off for any device connected to the PDU III, remotely, using a console or Ethernet connections. The PDU III comes with twelve power outlets, each of which can be monitored and controlled through the console or web interfaces.

The PDU III is also equipped with a console port for connecting an EMD (Environmental Monitoring Device) for sensing temperature and humidity along with two alarms that can be activated when either of the sensors shows unusual values. The PDU III is provided with two digital outputs which users can use for connecting status indicators or digital switches.

Features

- To calculate the power consumption on hourly basis, and have an accumulation of daily
- Provide detail data-logging for statistical analysis and diagnostic then auto email daily history report
- Daisy-chaining can cascade up 8 pieces PDU III
- Sequential power-up on the outlets / Allows users to configure the sequence in which power is turned on or off for each outlet
- Intelligently turn on/off devices based on event occurrence or planned schedule
- Event notification by pop-up/Sending Trap or E-Mail for events notification
- Twelve power outlets that can be turned on or off in multiple ways, with easy monitoring of current consumption
- Set over-current watchdog for each outlet (Threshold settings for over-current warnings and alerts)
- Versatile sensors supported through EMD (Environmental Monitoring Device) inputs
- Activate extended devices via digital outputs
- Comprehensive power management and flexible configuration through web browser, NMS, Telnet, SNMP, or HyperTerminal (console)
- Support Secure Socket Layer V3 and Secure Shell V1 protocols
- Administrator and multiple users with password protection for double-layer security
- Address-specific IP security masks to prevent unauthorized access
- User-friendly interface to display input and output status

- Upgrade utility for easy firmware upgrade
- Available in 120V and 230V models

Package Contents

Make sure the PDU III package has the following items. If any of items is missing or damaged, contact your nearest service center or vendor.

1. PDU IPS-1201
2. Ears (x2)
3. U-type handles (x2)
4. U-type handle screws (x4)
5. Ear screws (x6)
6. Feet screws (x4)
7. Feet (x4)
8. Quick Install Guide
9. Power cord (x1) for 1-inlet model
10. USB cable

Hardware Components

Take a moment to familiarize yourself with the PDU III front and rear panels. The following sections provide descriptions about the front and rear panel components and how to use them.

Front Panel of 1-inlet Model

Component	Description
1. LCM indicator	User can configure the **LCM Direction**, **Daisy Chain**, **RS485 Terminal Resistor**, **Inlet Energy**, **Outlet On/Off** of this PDU from this LCM. Regarding to turn on/off outlet, if this PDU has support network function, user can set the whole outlet configuration from **Outlet Control** webpage. The **Outlet Control** page displays.
2. LCM button	▼ Press the **Down** button to navigate through the menu options. ▲ Press the **Up** button to navigate through the menu options. ⬇ Press the **Set** button to access the menu options and confirm user selection. ESC Press the **ESC** button to cancel any

	configuration or leave to up menu.
3. Serial port	User can also connect an optional EMD to this port.
4. Ethernet (LAN) port	Enable user to configure the PDU III through a LAN or WAN.
5. Mini USB (CONSOLE) port	Enable you to configure the PDU III using the Mini USB port.
6. Reset button	Enable you to reset the PDU III in case the system locks up.
7. Daisy-chaining port	Enable user to cascade next PDU III through a CAT 5 cable.
8. Breaker	Prevent excessive current flow to protect the system.

Status indicators

The front panel of the PDU III has several LED indicators that provide information about the input and output power status. The following table describes these status indicators.

Main Menu Screen of Single Phase PDU
IP: XXX.XXX.XXX.XXX Input: XXX.XV Daisy Chain: Mater 01
LCM Direction Screen
LCM Direction XX → LCM Direction Setting: XX
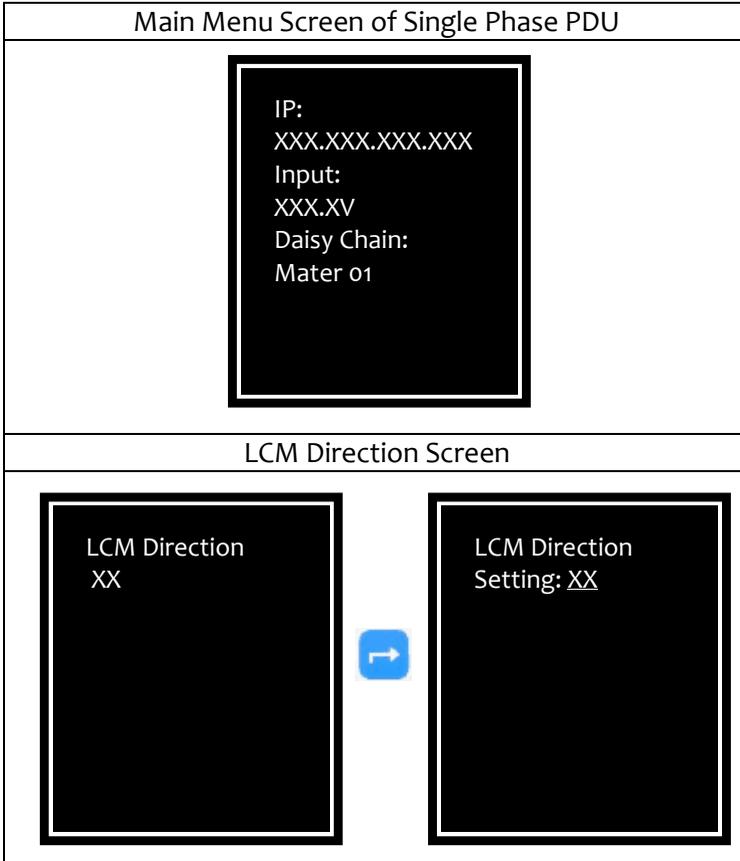
Daisy Chain Screen	
Daisy Chain: Master 01	Daisy Chain: Setting : Master 01

RS485 Terminal Resistor Screen	
RS485　Terminal Resistor: XXX	RS485　Terminal Resistor: XXX

Inlet Screen	
Inlet: XX.XX/XX.XX A XXX.X V XXXX.X/XXXX.X W XXX.X kwh XXX.X %	Inlet Info. Version: Vx.XXX Type:　　X-Phase XX/XX A

Total Power Screen
Total Power: XXXXX.X W Total Energy: XXXXX.X kwh

Clear Inlet Energey Screen
Clear All the Inlet Energy: XXXX.X	→	Clear All the Inlet Energy: XXXX.X

Clear Outlet Engergy Screen
Clear All the Outlet Energy: XXXX.X	→	Clear All the Outlet Energy: XXXX.X

Save Energy	
Save Energy: XX	Save Energy: <u>XX</u>

Control All the Outlet Screen	
Control All the Outlet: XX	Control All the Outlet: <u>XX</u>

Outelet On/OFF Screen(1/4)	
Outlet 01 & 02: XX.XX/XX.XX A XXX.X V XXXX.X/XXXX.X W XXXX/XXXX kwh XXX.X/XXX.X % Relay 1: ON Relay 2: OFF	Outlet 01& 02: Version: Vx.XXX Type: A2 Relay

Outelet On/OFF Screen(2/4)

```
Relay 01: XX
Relay 02: XX
```

→

```
Relay 01: XX
Relay 02: XX
```

Outelet On/OFF Screen(3/4)

```
Outlet n & n+1:
XX.XX/XX.XX A
XXX.X V
XXXX.X/XXXX.X W
XXXX/XXXX kwh
XXX.X/XXX.X %
Relay 1: ON
Relay 2: OFF
```

→

```
Outlet n&n+1:

Version:
Vx.XXX

Type: A2 Relay
```

Outelet On/OFF Screen(4/4)

```
Relay n: XX
Relay n+1: XX
```

→

```
Relay 01: XX
Relay 02: XX
```

Rear Panel of NEMA 5-15R
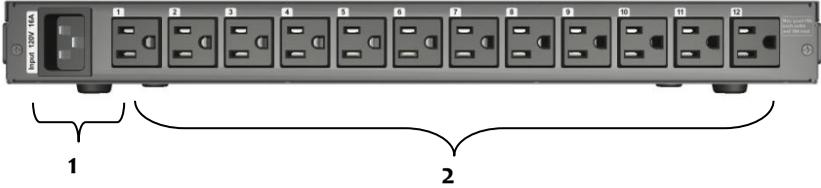
Rear Panel of IEC C-13
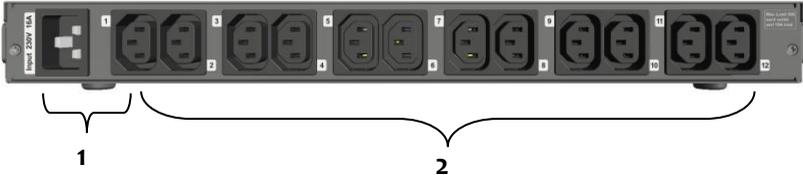
Rear Panel Components

Component	Description
1. Input power(G1)	Connect to a power outlet 1-inlet model: * G1 supplies power to outlet 1 to 12
2. Power outlet(1 ~ 12)	Connect a device to each power outlet to supply power to it. *NEMA 5-15R: The maximum load is 15 Amps for one outlet. *IEC-320-C13: Two outlets group into one unit and the maximum load is 10 Amps for one unit or one outlet.

Getting Started

This section provides information about setting up the PDU III, connecting power, and connecting devices to it before users start using it for power management. Read this section carefully to learn how to connect various devices to the PDU III.

Attaching the Feet

The PDU III comes with four feet or spacers that are attached to the bottom. Use the four screws provided with the feet to attach the feet to the bottom of the PDU III as shown:

Note: Users do not need to attach the feet if users are going to install the PDU III in a rack.

Attaching the Ears

The PDU III is designed to be placed in a rack arrangement and comes with two ears (mounting brackets) that help users to move the device easily. Attach each ear with the three screws provided in the package.
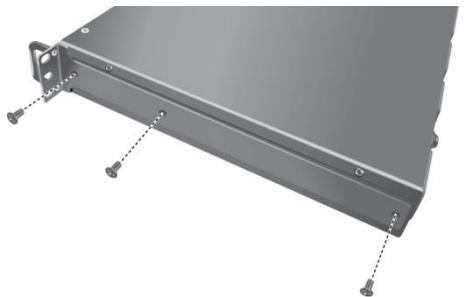
Rack Mounting

The PDU III can be installed in most standard 19" (1U) racks. After attaching the ears to each side of the device, position the device in the rack and align the holes in the ears (mounting brackets) with the hole in the rack. Use the screws supplied with your racks to tighten the ears (mounting brackets) to the rack.

Making Connections

The PDU III is a versatile product that can be connected to several different types of input and output devices. This makes it a useful tool for connecting devices to it and controlling their power on/off status through its user interface.

The PDU III can be attached to twelve output devices whose power status can be controlled remotely. It also supports an EMD (Environmental Monitoring Device) connecting with sensors for detecting environmental conditions as well as digital outputs for enabling devices with normally open or normally close conditions. Moreover, the PDU III supports a Mini USB port (console) and Ethernet (LAN/WAN) connection that lets users control the PDU III outputs remotely.
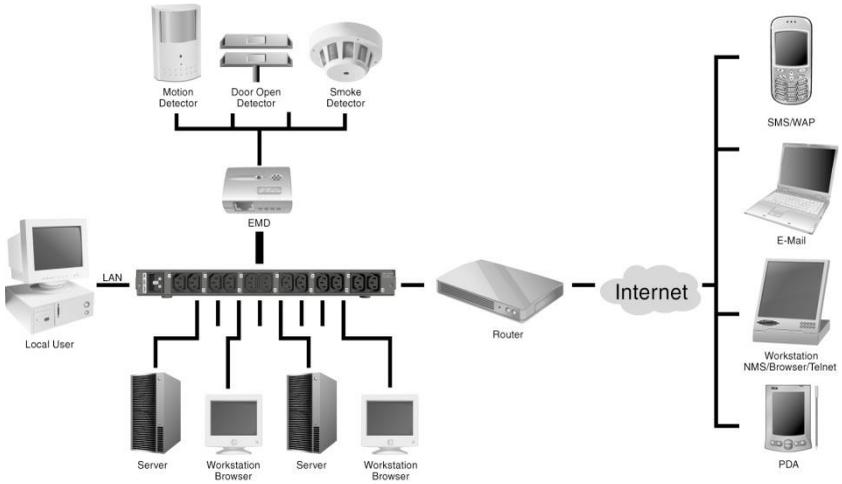
The following procedure describes the basic steps needed to set up the PDU III:

Connecting PDU III

The 1-inlet model has just one inlet for supplying power to all outlets. For each inlet, connect the power cord to the power inlet and plug the other end into a power outlet as shown:

1. To set up the hardware, connect power to the power inlet and output devices to the power outlets. Connect devices with normally open or normally close conditions to the digital output ports, and an EMD to the console port.

2. To configure the PDU III, users can use the console or LAN port. Connect the PDU III to a console and a LAN to enable its configuration through the console or browser menu.
3. After connecting to a console, use a console application such as PuTTY to access the console menu. Please set up the PuTTY configuration as shown firstly. After PuTTY configuration and please enter default user name and password (admin/admin). Select the **IP, Time and System Group** submenu under the **PDU Configuration Settings** to set up the related IP address and the system date/time. This IP address will be used while accessing the web interface to configure the PDU III parameters.

a. To configure the related **Serial line** and **Speed** (115200) of the PuTTY. Regarding to Serial line, please check **Connection Port (COM)** of **Device Manger** in the Window system.

b. To enter the username and password (default username and password: admin).

c. To select **PDU Configuration Setting**.

d. To Select **IP, Time and System Group**.
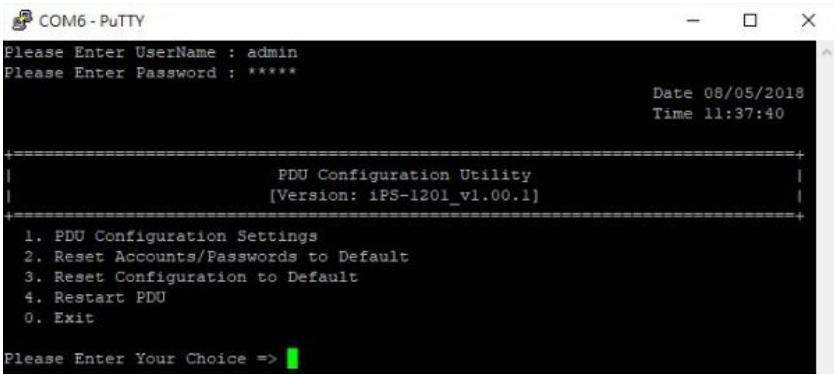
```
COM6 - PuTTY                                          —   □   ×
Please Enter Password : *****
                                               Date 08/05/2018
                                               Time 11:37:40

+=====================================================================+
|                      PDU Configuration Utility                      |
|                      [Version: iPS-1201_v1.00.1]                    |
+=====================================================================+
 1. PDU Configuration Settings
 2. Reset Accounts/Passwords to Default
 3. Reset Configuration to Default
 4. Restart PDU
 0. Exit

Please Enter Your Choice => 1

+=====================================================================+
|                      PDU Configuration Utility                      |
|                      [PDU Configuration Settings]                   |
+=====================================================================+
 1. IP, Time and System Group
 0. Back to Main Menu

Please Enter Your Choice => █
```

e. To Select **IPV4 Group.**


```
COM6 - PuTTY                                          —   □   ×
+=====================================================================+
|                      PDU Configuration Utility                      |
|                      [PDU Configuration Settings]                   |
+=====================================================================+
 1. IP, Time and System Group
 0. Back to Main Menu

Please Enter Your Choice => 1

+=====================================================================+
|                      PDU Configuration Utility                      |
|                      [IP, Time and System Group]                    |
+=====================================================================+
    Firmware Version : iPS-1201_v1.00.1
    Ethernet Address : 00:E0:D8:FF:C0:DB
 1. IPv4 Group
 2. IPv6 Group
 3. Date and Time Group
 4. System Contact   : Technical Support Team
 5. System Name      : IPS-1201 Intelligent Power
 6. System Location  :
 0. Return to previous menu

Please Enter Your Choice => █
```

f. To configure the related IPv4 parameters.
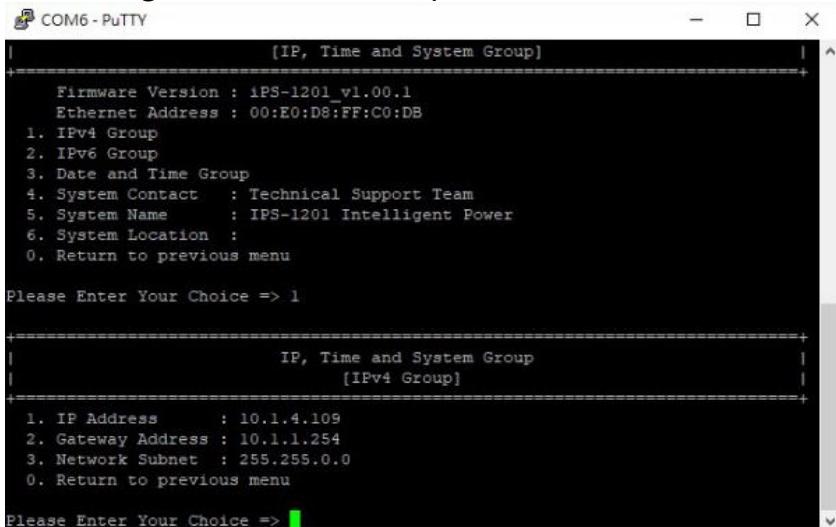

```
COM6 - PuTTY                                             —   □   ×

                    [IP, Time and System Group]
+===============================================================+
    Firmware Version : iPS-1201_v1.00.1
    Ethernet Address : 00:E0:D8:FF:C0:DB
  1. IPv4 Group
  2. IPv6 Group
  3. Date and Time Group
  4. System Contact   : Technical Support Team
  5. System Name      : IPS-1201 Intelligent Power
  6. System Location  :
  0. Return to previous menu

Please Enter Your Choice => 1

+===============================================================+
              IP, Time and System Group
                      [IPv4 Group]
+===============================================================+
  1. IP Address      : 10.1.4.109
  2. Gateway Address : 10.1.1.254
  3. Network Subnet  : 255.255.0.0
  0. Return to previous menu

Please Enter Your Choice =>
```

4. After connecting to LAN, open a browser from a PC in the network and use the PDU III's IP address specified through the console menu to open the web interface for system configuration.

The following sections provide instructions about how to make various connections.

Connecting Output Devices

The PDU III has twelve power outlets for connecting devices such as workstations, servers, and printers. Their power on/off status can be controlled remotely through the LAN and Console ports. Connect the power connectors of the devices to each of the power outlets 1 through 12 with the power cords supplied with the devices as shown:

Server   Workstation   Server   Workstation
Browser   Browser
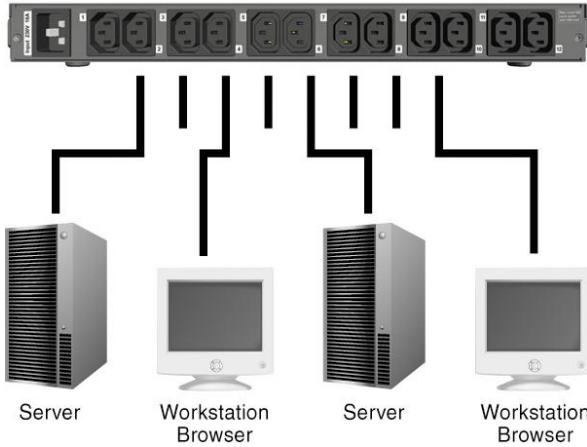
Connecting EMD

An Environmental Monitoring Device (EMD) that is connected to sensors for detecting temperature, humidity, water leak, and so on can be connected to the PDU III with the console port. The EMD can also be connected to alarms or indicators and controlled through the PDU III. Connect the EMD to the console port as shown:

Motion Detector   Door Open Detector   Smoke Detector

EMD
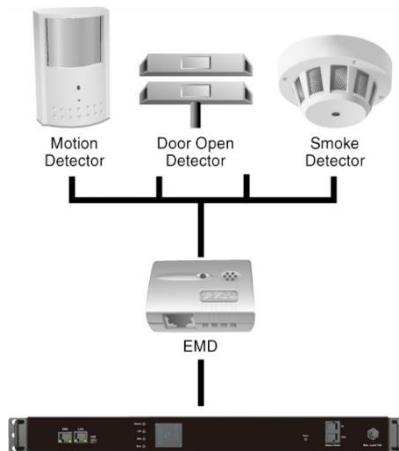
After connecting to EMD, open a browser from a PC in the network. The temperature and humidity status is automatically displayed on the **PDU III Environment Monitoring** page.

Connecting the Console

Users can control the output devices and manage the power status through a Mini USB connection with a PC. Use the Mini USB cable provided in the PDU III package to connect the USB port of the PC and the Mini USB port of the PDU III as shown.

Refer to Connecting PDU III on page 21 to learn how to use the console with a console application such as PuTTY.

Connecting to a LAN/WAN

The PDU III has an RJ-45 LAN connection that enables users to monitor and manage the power outlets and digital outputs over the network. The PDU III has a graphic user interface that allows users to control the device through a web
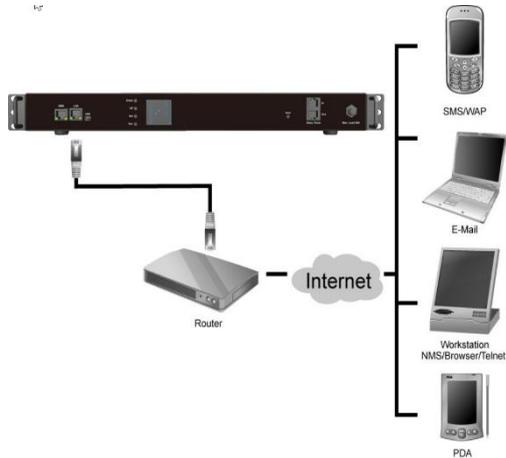
browser. Connect the PDU III to a free port on the router using an Ethernet cable as shown. Users can then control the PDU III from PC, laptop, mobile phone, or PDA which is connected to the router network.

Daisy Chaining

To manage more devices, up to 7 additional PDU IIIs can be daisy chained to the first unit. Follow instructions below to set up a daisy chained installation.

1. For each PDU III that you add to the chain, use CAT 5 cables to connect it to the parent PDU III's Daisy Chaining Port. The upper **In** port( ) of child PDU III is connected to lower **Out** port( ) of its parent PDU III and the lower **Out** port( ) of the lowest level PDU III is connected to the highest level parent's upper **In** port( ) to form a cyclic(ring) structure as illustrated in the following figure.

2. The daisy chained installation can operate in Manual mode. Use Daisy-chaining mode in the LCM to set the operation mode.

Use LCM on the front panel to set the (Daisy Chain) ID number for each PDU III that you add to the chain. You may set Master 01 for the first unit (Master) and the Salve 02 for the second unit (Slave 02) etc. The screen for Daisy Chain is described in the following.
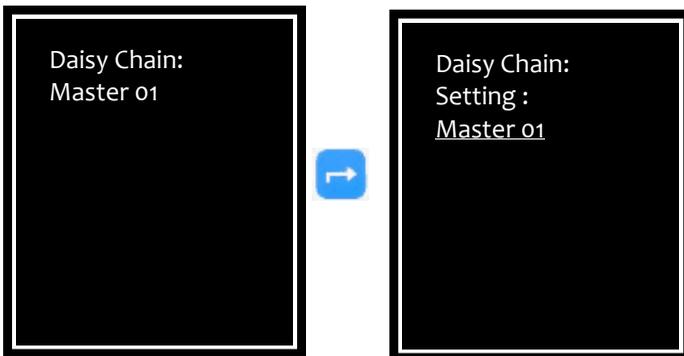
3. After configure the Daisy Chain ID from LCM, please disable **Master Device** from **Maintenance** webpage of the **Settings** menu for Slave PDUs as shown. It will make sure the Master and Slave function of Daisy Chain works normally.
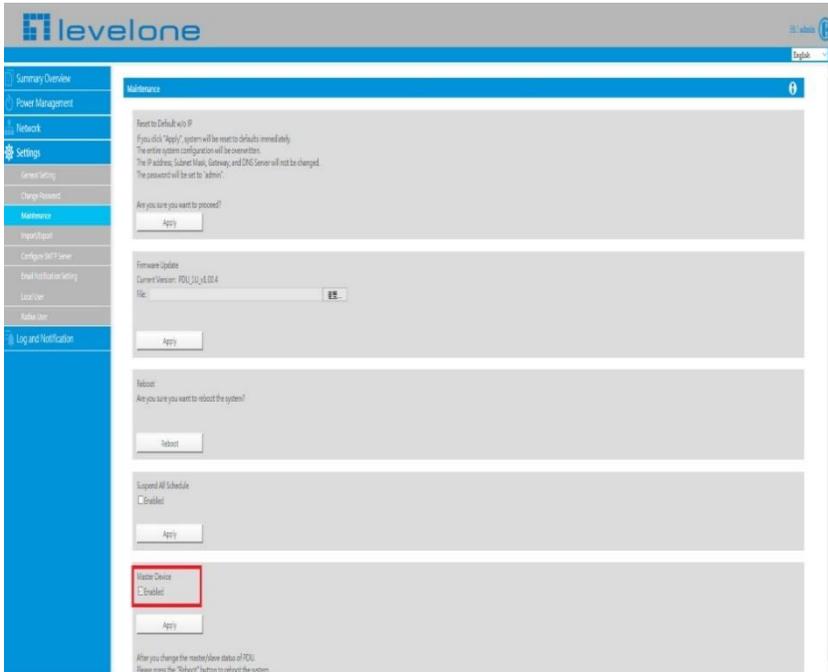
After all the PDU IIIs have been set up, power on all the PDU IIIs. All the PDU IIIs and connected devices in the Daisy Chain can be controlled through Web Interface.

Select **System Overview** from the System Overview menu. The Overview page displays as shown.

Select **Inlet Configuration** from the Power Management menu. The Inlet Configuration page displays as shown.

Select **Outlet Control** from the Power Management menu. The Outlet Control page displays as shown.

Select **Outlet Grouping** from the Power Management menu. The Outlet Grouping page displays as shown.
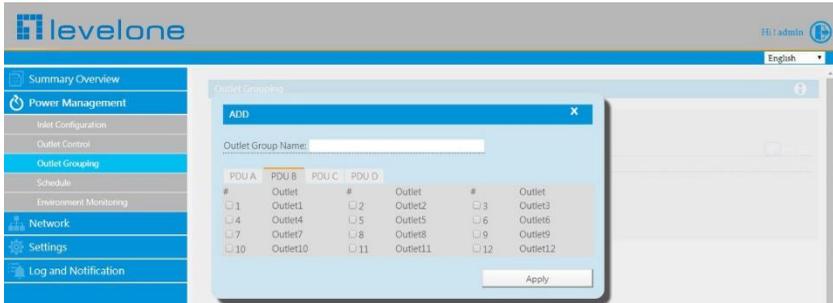
Select **Schedule** from the Power Management menu. The Schedule page displays as shown.
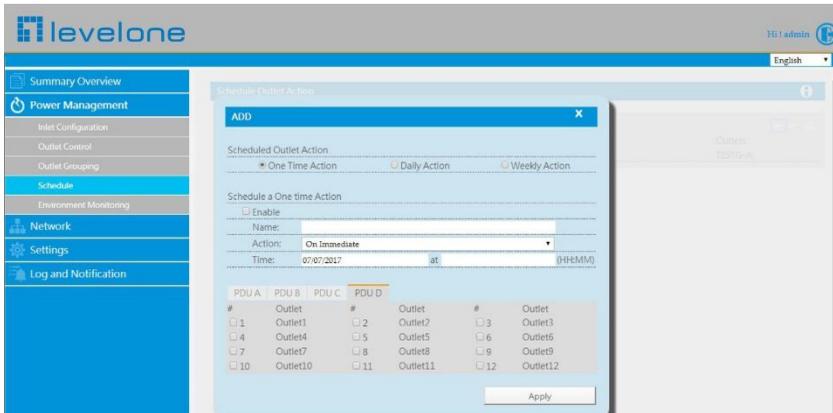
Appendix

Specifications

The specifications for PDU are listed as following:

Model	PDU IPS-1201	
Type	120V	230V
Acceptable input voltage	100-125VAC 50/60Hz	200-240VAC 50/60Hz
Maximum input current (phase)	16A	16A
Input power	1.7 KVA	4 KVA
Input frequency	50/60Hz	50/60Hz
Input connection	IEC 320 C-20	
Output voltage	100-125 VAC	200-240 VAC
Output Receptacles	IEC-320-C13 x 12 (Grouping 2pcs outlet into 1 unit) NEMA 5-15R x 12	
Output current (outlet)	IEC-320-C13: 10A Each unit	
	NEMA 5-15R: 15A Each Unit	
	CT and Relay will be support 16A	
Maximum output current (phase)	16A	16A
Locking Power Cord Solution	Plug Sleeve	
LCD display	Displays power status of system	
Ethernet port	Enables user to configure the PDU through a LAN or WAN	
mini USB port	Enables user to configure the PDU using this port	
EMD port	User can also connect an optional EMD to this port	
Daisy-chain port	Up to eight rack PDUs share one IP address	
Operating temperature	0 to 50℃	
Temperature non-operating	-40 to 65℃	
Humidity operating	20 ~ 80 %	

Humidity non-operating	5 ~ 95 %
Enclosure Dimensions	431.6(W) x 200(D) x 42(H) mm
Power cord length	3.0 m (10 ft)
Accuracy	± 3% full scale
Regulation application	FCC Class A
	CE, LVD
Warranty	Two years (Not include LCD)

Regulatory Information

FCC Statement

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

- This device may not cause harmful interference; and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING! The use of a shielded-type power cord is required in order to meet FCC emission limits and to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used. Use only shielded cables to connect I/O devices to this equipment. Users are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate the equipment.

CE

This device complies with the EMC directive of the European Community and meets or exceeds the following technical standards:

- EN 55022 CE commits and Methods of Measurement of Radio interference Characteristics of Information Technology Equipment." This device complies with the CISPR Class A standard.
- EN 55024 CE complies with the CISPR Class A standard.mmunity standard, Part 1: Residential and light industry."