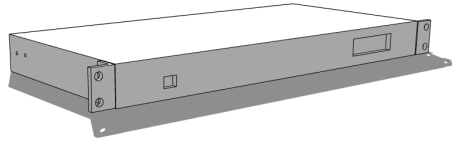


Smart Switched PDU Installation



Models

SPDU-D308H

SPDU-D308V

Important Safety Instruction

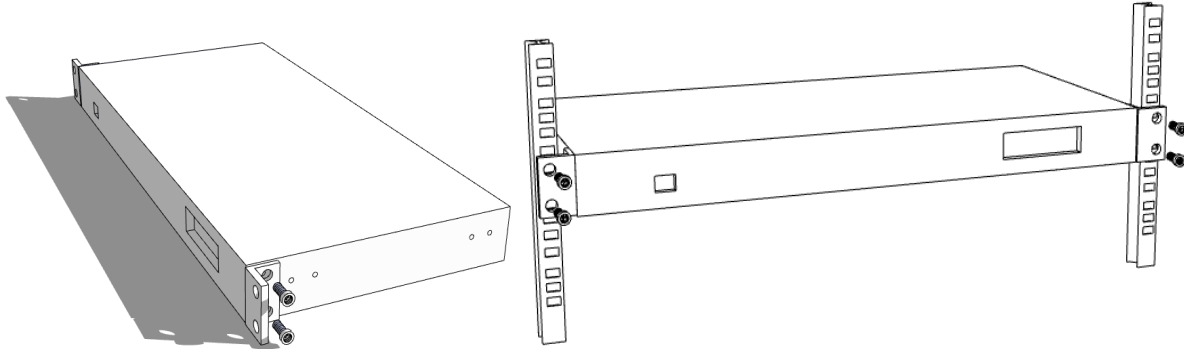


There are no user-serviceable parts inside. Do not attempt to open any part of Power Distribution Unit (PDU). Doing so may expose you to possible shock hazard and voids the product warranty.

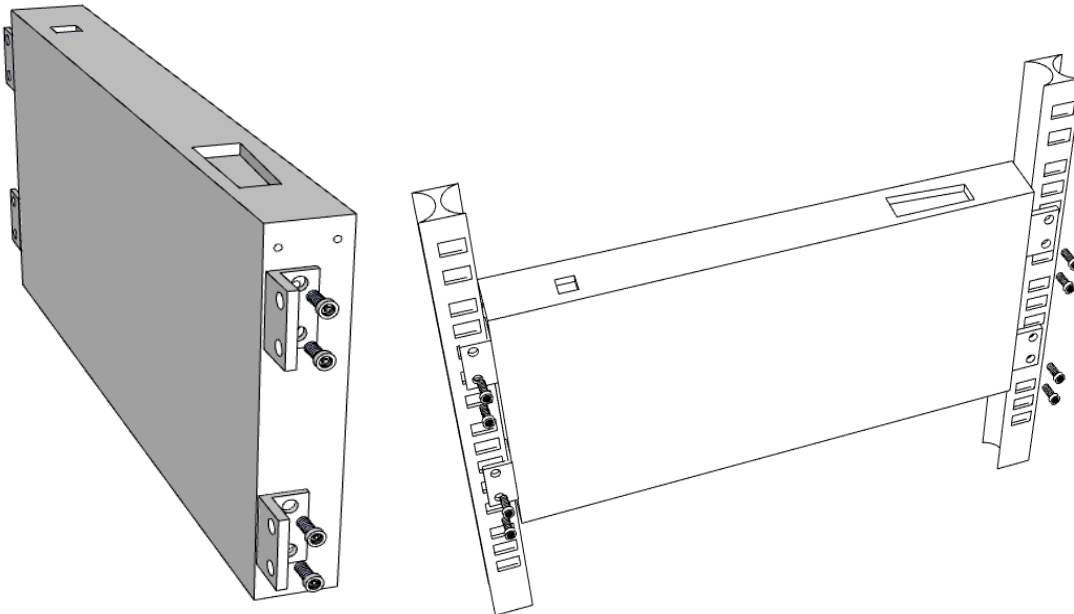
- The PDU does not provide short-circuit protection. Therefore, Echola Systems does not recommend plugging the unit directly into any unprotected power source, such as a wall outlet. Always connect to an appropriately rated branch circuit's outlet which provides short-circuit protection using standard Circuit Breakers or Fuses.
- Always maintain reliable earthing of the PDU. Do not connect the PDU to an ungrounded outlet or adapters or extension cords that doesn't have ground connection.
- The power requirement of each equipment connected to the PDU's outlet should not exceed individual outlet's rated maximum capacity (refer to specification of appropriate model for ratings).
- The aggregate power requirements of equipments connected to all outlets at any time should not exceed the maximum input capacity of PDU (refer to specification of appropriate model for ratings).
- Install the PDU where it may be easily disconnected for service.
- The PDU is designed for indoor use only. Avoid exposing to extreme ambient temperatures.

Installing in a Rack (SPDU-D308H)

The PDU can be installed in a standard 19" rack or enclosure. It can be mounted horizontally at front of the rack or vertically at the back as shown below.





Rack Horizontal Installation





Vertical Installation at the back of the Rack

SPDU-D308H Specification

Input	
Acceptable Input voltage range	120-380V DC
Input plug type	Andersonn Saf-D-Grid connectors with First Mate, Last Break Ground Contact. 
Maximum Input Current	20A
Input Current Monitoring Accuracy	±2%
Cord Length	N/A
Power Consumption	< 5 Watts
Output	
Output voltage	Same as Input
Output receptacle type	Andersonn Saf-D-Grid connectors with First Mate, Last Break Ground Contact 
Maximum Output current/outlet	12A (Aggregate current of all outlets can't exceed Max. Input current)
Number of Outlets	8
Outlet Current Monitoring Accuracy	±5%
Interfaces	
Network Interface	RJ45, 10Base-T Ethernet
Front Panel display	2x16 Color character LCD with LED backlight
Environmental	
Operating Environment	32-113° F
Operating Relative Humidity	0-95%
Operating Elevation	0-10000 feet
Physical	
Net weight	~10 lbs
Maximum height	1.75 inches (1U)
Maximum width	17.5 inches
Maximum depth	8 inches
Color	Olive Green front panel, Grey chassis

SPDU-D308V Specification

Input	
Acceptable Input voltage range	120-380V DC
Input plug type	Andersonn Saf-D-Grid connectors with First Mate, Last Break Ground Contact. 
Maximum Input Current	20A
Protection	Midget Fuse Protection with indicator
Input Current Monitoring Accuracy	±2%
Cord Length	N/A
Power Consumption	< 5 Watts
Output	
Output voltage	Same as Input
Output receptacle type	Andersonn Saf-D-Grid connectors with First Mate, Last Break Ground Contact 
Maximum Output current/outlet	12A (Aggregate current of all outlets can't exceed Max. Input current)
Number of Outlets	8
Outlet Current Monitoring Accuracy	±5%
Interfaces	
Network Interface	RJ45, 10Base-T Ethernet
Front Panel display	2x16 Color character LCD with LED backlight
Environmental	
Operating Environment	32-113° F
Operating Relative Humidity	0-95%
Operating Elevation	0-10000 feet
Physical	
Net weight	~10 lbs
Maximum height	19 inches (1U)
Maximum width	5 inches
Maximum depth	3.5 inches
Color	Grey chassis

Initial Software Configuration

You may need to change network settings of Echola PDU device before connecting it to your network's switch/router. If your network has a DHCP server then you may want to skip this section and connect PDU Ethernet port to their network's switch/router and the IP address will be assigned automatically by your DHCP server. The assigned IP address will be shown on the LCD panel. Use that IP to login into PDU and manage it.

If you don't have a DHCP server running on your network then you may want to configure Static IP; there are three ways you could do this:

1. Using NBNS (NetBIOS Name Service) of PDU
2. Using built-in DHCP server of PDU
3. Using Static IP configuration of your PC/Laptop

[Using NBNS \(NetBIOS Name Service\)](#)

You would need a Windows based Laptop or a PC to configure PDU using this method for the first time. You may also need a ethernet crossover cable to connect PDU to a PC or a Laptop but most of the modern PC/Laptops would work with either type of cable (straight or crossover). Make sure the PC/Laptop IP option "Obtain IP address automatically" is checked in the Internet Protocol Properties of the ethernet interface. Now launch the internet browser and type <http://echolasys> in the address bar and press Enter key. Now you will be prompted with a PDU's login dialog; If this is first time then use default username and password. After login, you will see the main menu page of the PDU. Now click on the Setup tab of the menu to bring the Network Config menu. From here you can assign static IP, subnet mask and gateway and save your configuration. That's it, now you are set to connect PDU to your network/switch/router and access it from remote.

- **Default Username:** admin
- **Default Password:** admin

[Using built-in DHCP server](#)

The procedure is same as above NBNS except that instead of using hostname 'echolasys' in your browser you will have to use the IP address (like <http://192.168.2.222>) displayed on the LCD panel. This method works for non-windows PC/Laptop as well.

[Using Static IP configuration](#)

Configure your PC/Laptop ethernet port's IP address to match the network portion of default IP address of PDU.



- **Default IP Address of PDU:** 192.168.2.222
- **Default Gateway of PDU:** 192.168.2.222
- **Default Subnet mask of PDU:** 255.255.255.0

For example you can configure your PC/Laptops IP address as 192.168.2.222 and access the main menu of PDU. After configuring the PC/Laptop ethernet address, just use any internet browser to access PDU with new configure IP address. Now you will be prompted with PDU's login dialog; If this is first time then use default username and password. Now the default network settings of IP, subnet mask and gateway can be changed to match your network setting through **Setup** tab.

- **Default Username:** admin
- **Default Password:** admin

User Authentication

Admin user is always the privileged user who can access any web page. You can also create a different user who can access to main Control/Monitor page but is not allowed to access **Setup** page. This user is by default called "guest" but name can be changed using **Setup->User** tab and default password is "guest" as well.

If the authentication fails "Authentication Required" message will be displayed. The authentication can optionally be disabled for Control/Monitor web page (the home page) on the main menu by using **Setup->User** setting so that admin or guest user can access main page without login but the **Setup** web page will still require login.

User Interfaces

Front Panel LCD

LCD moving character display on the front panel displays following important information. This is useful when you are near the device to setup or monitor.

1. Hostname
2. IP Address
3. Outlet Status
4. Total Current Consumption in Amps

The outlet status shows the status of all 8 outlets and it could be one of the following,

- (1) o (Empty circle): means corresponding outlet is switched OFF
- (2) ● (Filled circle): means corresponding outlet is switched ON
- (3) x (Cross): means corresponding outlet has been shut off due to overload (Individual port overload protection feature)

Web Interface

You will have to make sure that you are running latest version (you need version 7 and above) of runtime JAVA on your PC or Linux variants. You can configure, monitor and control the PDU through user friendly web interface. The web interface uses AJAX for providing near real-time update on current consumption for each outlets, total current, Temperature and outlet statuses.



The screenshot shows the Echola Systems web interface in Internet Explorer. The browser address bar shows <http://echolasy.com/>. The interface features a navigation menu with options: Control/Monitor, Device Info, Setup, Automation, Reports, and Help. The main content area displays the following information:

Temperature: 71°F

Outlet Number	Status/ Toggle	Current Consumption	On/Off Control
1	●	7.1	---
2	●	1.0	---
3	●	1.0	---
4	●	1.0	---
5	●	1.0	---
6	●	1.0	---
7	●	1.0	---
8	●	1.0	---
Total Current		14.3	<input type="button" value="Update"/>

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To access GUI from any smart phone/mobile devices, just use letter '/m' after the ipaddress or the hostname, like <http://192.168.2.21/m>

You can refer to “Help” page of web interface for more information on web interface features.

Alternatively you can also refer to latest User’s Manual at <http://www.echola.com/support>.



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Automation

You can use Tcl scripting language (refer to separate document for automation using Tcl) or Perl or SNMP for automation. Here is an example how to use Perl script which uses api.xml file from the PDU to parse certain outputs. If you are on windows you can use strawberry perl.

```
#####  
#   Command Syntax: perl xmlget.pl http://<ipaddress>           #  
#####  
use LWP::UserAgent;  
use XML::Simple;  
$IPADDR = shift;  
  
# create objects  
$xml = new XML::Simple;  
$ua = LWP::UserAgent->new;  
  
# send request for api.xml  
$REQUEST=$IPADDR . "/api.xml";  
$req = HTTP::Request->new(GET => $REQUEST);  
$req->header('Cookie' => 'test=quest');  
$res = $ua->request($req);  
$data = $xml->XMLin($res->content);  
  
# print them  
print "Outlet1 Power: $data->{pow1}";  
print "Outlet2 Power: $data->{pow2}";  
print "Outlet3 Power: $data->{pow3}";  
print "Outlet4 Power: $data->{pow4}";  
print "Outlet5 Power: $data->{pow5}";  
print "Outlet6 Power: $data->{pow6}";  
print "Outlet7 Power: $data->{pow7}";  
print "Outlet8 Power: $data->{pow8}";  
print "Voltage/Frequency: $data->{volt}";  
print "Temperature: $data->{temp}";
```



SNMP Interface

Echola Systems sPDU supports SNMP v2c. Any network management systems that supports SNMP v2c can be used to monitor and control sPDU using following MIBs.

MIB Information

Here is the snmpwalk output from 16-outlet SPDU... [root@localhost ~]# snmpwalk -v2c -c public 192.168.2.11

SNMPv2-MIB::sysDescr.0 = STRING: Echola RPS208 sPDU running SNMP v1/v2c Agent

SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.28465

DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (34817) 0:05:48.17

SNMPv2-MIB::sysContact.0 = STRING: techsupport@echola.com

SNMPv2-MIB::sysName.0 = STRING: Echola Systems

SNMPv2-MIB::sysLocation.0 = STRING: Echola sPDU

SNMPv2-MIB::sysServices.0 = INTEGER: 7

The following table shows sPDU specific MIB variables information

Name	OID	Data Type	Type (Read/Write)	Possible Values
ProductName	1.3.6.1.4.1.28465.1.1	STRING	READ ONLY	
ProductVersion	enterprises.28465.1.2	STRING	READ ONLY	
ProductVersionDate	enterprises.28465.1.3	STRING	READ ONLY	
Outlet1Status	enterprises.28465.3.1	INTEGER	READ/WRITE	1/0 (1=on, 0=off)
Outlet2Status	enterprises.28465.3.2	INTEGER	READ/WRITE	1/0
Outlet3Status	enterprises.28465.3.3	INTEGER	READ/WRITE	1/0
Outlet4Status	enterprises.28465.3.4	INTEGER	READ/WRITE	1/0
Outlet5Status	enterprises.28465.3.5	INTEGER	READ/WRITE	1/0
Outlet6Status	enterprises.28465.3.6	INTEGER	READ/WRITE	1/0
Outlet7Status	enterprises.28465.3.7	INTEGER	READ/WRITE	1/0
Outlet8Status	enterprises.28465.3.8	INTEGER	READ/WRITE	1/0
Outlet9Status	enterprises.28465.3.9	INTEGER	READ/WRITE	1/0
Outlet10Status	enterprises.28465.3.10	INTEGER	READ/WRITE	1/0
Outlet11Status	enterprises.28465.3.11	INTEGER	READ/WRITE	1/0
Outlet12Status	enterprises.28465.3.12	INTEGER	READ/WRITE	1/0
Outlet13Status	enterprises.28465.3.13	INTEGER	READ/WRITE	1/0
Outlet14Status	enterprises.28465.3.14	INTEGER	READ/WRITE	1/0
Outlet15Status	enterprises.28465.3.15	INTEGER	READ/WRITE	1/0
Outlet16Status	enterprises.28465.3.16	INTEGER	READ/WRITE	1/0
Outlet1Measure	enterprises.28465.4.1	STRING	READ ONLY	xx.xx



Outlet2Measure	enterprises.28465.4.2	STRING	READ ONLY	xx.xx
Outlet3Measure	enterprises.28465.4.3	STRING	READ ONLY	xx.xx
Outlet4Measure	enterprises.28465.4.4	STRING	READ ONLY	xx.xx
Outlet5Measure	enterprises.28465.4.5	STRING	READ ONLY	xx.xx
Outlet6Measure	enterprises.28465.4.6	STRING	READ ONLY	xx.xx
Outlet7Measure	enterprises.28465.4.7	STRING	READ ONLY	xx.xx
Outlet8Measure	enterprises.28465.4.8	STRING	READ ONLY	xx.xx
Outlet9Measure	enterprises.28465.4.9	STRING	READ ONLY	xx.xx
Outlet10Measure	enterprises.28465.4.10	STRING	READ ONLY	xx.xx
Outlet11Measure	enterprises.28465.4.11	STRING	READ ONLY	xx.xx
Outlet12Measure	enterprises.28465.4.12	STRING	READ ONLY	xx.xx
Outlet13Measure	enterprises.28465.4.13	STRING	READ ONLY	xx.xx
Outlet14Measure	enterprises.28465.4.14	STRING	READ ONLY	xx.xx
Outlet15Measure	enterprises.28465.4.15	STRING	READ ONLY	xx.xx
Outlet16Measure	enterprises.28465.4.16	STRING	READ ONLY	xx.xx
TotalMeasure	enterprises.28465.5.1	STRING	READ ONLY	xx.xx
OverLoadProtectionStatus	enterprises.28465.6.1	INTEGER	READ ONLY	16bit status (see below)
Daily Report	enterprises.28465.7.1	INTEGER	READ ONLY	24 comma separated values
Monthly Report	enterprises.28465.7.2	INTEGER	READ ONLY	31 comma separated values

Overload protection status

This is a sixteen bit status of overload protection feature. For example, if the OverLoadProtectionStatus value is 64 (b0000000001000000), then it means seventh outlet is shut (one in binary) due to overload condition. For more details on the overload status look at Overload Protection section above.

Here is a snapshot of snmpwalk of the enterprise Echola sPDU MIB

```
[root@localhost ~]# snmpwalk -v2c -c public 192.168.2.11 enterprises.28465
SNMPv2-SMI::enterprises.28465.1.1.0 = STRING: "Echola sPDU SNMPv2c Agent "
SNMPv2-SMI::enterprises.28465.1.2.0 = STRING: "v1.0"
SNMPv2-SMI::enterprises.28465.1.3.0 = STRING: "Aug 2009"
SNMPv2-SMI::enterprises.28465.2.1.1.1.0 = INTEGER: 0
SNMPv2-SMI::enterprises.28465.2.1.1.1.1 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.2.1.1.2.0 = INTEGER: 0
SNMPv2-SMI::enterprises.28465.2.1.1.2.1 = INTEGER: 0
SNMPv2-SMI::enterprises.28465.2.1.1.3.0 = IpAddress: 0.0.0.0
SNMPv2-SMI::enterprises.28465.2.1.1.3.1 = IpAddress: 0.0.0.0
SNMPv2-SMI::enterprises.28465.2.1.1.4.0 = STRING: "public"
SNMPv2-SMI::enterprises.28465.2.1.1.4.1 = Hex-STRING: 00
SNMPv2-SMI::enterprises.28465.3.1.0 = INTEGER: 1
```



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Telnet Interface

Echola Systems sPDU supports very simple control and monitor functions through telnet. Telnet is an interactive interface that show all available commands through command line 'help'. Here is the output of telnet command line interface.

Echola Power Systems Telnet Server 1.1

Login: admin

Password:

ECHOLASYS> help

switch [on|off|reset] [Outlet#|all]

show status [Outlet#|all]

reboot

exit

help

ECHOLASYS> show status all

Outlet1: ON

Outlet2: ON

Outlet3: ON

Outlet4: ON

Outlet5: ON

Outlet6: ON

Outlet7: ON

Outlet8: ON

ECHOLASYS> switch off 3

ECHOLASYS> show status 3

off

ECHOLASYS>

ECHOLASYS> show status all

Outlet1: ON

Outlet2: ON

Outlet3: OFF

Outlet4: ON

Outlet5: ON

Outlet6: ON

Outlet7: ON

Outlet8: ON

ECHOLASYS>



Troubleshooting

- If you get **connection lost messages** when you are on any GUI page (telnet or snmp might still work), you will have to make sure you are running latest version of JAVA on the PC where you run the browser to log into the smart PDU. The older versions of java (ver <= 5 or early 6 versions) doesn't work well with the AJAX calls that we use for real time updates. You can check whether you have latest java by clicking on following link <http://java.com/en/download/testjava.jsp> and do an update to avoid this intermittent problem.
- Also check for any malware/anti-virus/firewall software which might block the http connection to PDU.
- We don't support router-behind-router or router hacked to work in bridge-mode configurations. If you have such configuration you may want to connect the PDU to the primary router (router that acts as gateway or dhcp server).

For any technical questions, email to support@echola.com.