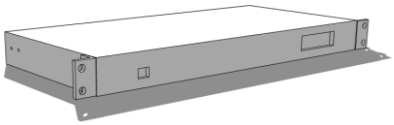
Smart Switched DC PDU Installation

Model: SPDU-DC408



(Document Rev 1.0)

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.

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SPDU-D408H Specification

Input	
Acceptable Input voltage range	160-400V 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%
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, 100Base-T Ethernet
Front Panel display	Bi-Color OLED
Environmental	
Operating Environment	32-113° F
Operating Relative Humidity	0-95%
Operating Elevation	0-10000 feet
Physical	
Net weight	~9 lbs
Maximum height	1.75 inches (1U)
Maximum width	19 inches
Maximum depth	5 inches
Color	ANSI Gray

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Initial Configuration

SPDU-D408H provides a USB console and an Ethernet (10/100) port for management. USB serial console port is normally used in special situations, for instance to debug network connectivity if SPDU-D408H is not reachable through Ethernet.

Dynamic IP

SPDU-D408H is shipped with DHCP client enabled by default. So, if you connect the unit to your network using the ethernet port then the unit will be assigned with an IP address automatically provided you have a DHCP server configured for that network. The assigned IP address will be displayed on the front panel OLED display. You can use that IP address to login to the unit or use the USB console port to login.

Serial Console Port

If you want to use USB console port to access the unit then you need a USB-A to micro USB cable to login through console. You can either use putty (on Windows) or screen (on Linux) or equivalent terminal emulation software. You will have to configure the terminal emulation software with **115200 baud rate with 8-N-1**. Also make sure you are using correct COM port number (You can find out the correct COM port using Device Manager on Windows).

You can login into the unit using either *ssh* or *telnet* client from any Linux machine or *putty ssh* client on Windows. The following user credentials are the default.

User: admin

password: *admin*

You can gain root access using sudo command; you will have to do *sudo bash* before configuring following.

Configuring Static IP

Use “psctl” command to configure a static IP address after login as “root” user. “psctl -?” shows detailed psctl command options with examples.

 # psctl -i 192.168.1.10 -m 255.255.255.0 -g 192.168.1.1

The above command configures IP address of SPDU-D408H as 192.168.1.10 with mask 255.255.255.0 and gateway & DNS as 192.168.1. Once the IP is configured you can then connect to SPDU-D408H using the new IP address.

Configuring Dynamic IP

If you have a DHCP server running on your network and you may want to dynamically assign an available IP address to SPDU-D408H by using following option.

 # psctl -D

Make sure you know the assigned IP address to login using “telnet” or “ssh”.

Configuring Hostname

You can also change the hostname of SPDU-D408H switch using “psctl”.

 # psctl –h SPDU-DC408-SW-10

The above command sets hostname to SPDU-DC408-SW-10.

Configuring DNS/Nameserver

To configure a DNS or Nameserver, you can use "-n" option of psctl.

 # psctl –n 192.168.1.11

Configuring Syslog Server

To send system generated events to an external syslog server, use "–S" option of psctl. You have to specify the address of the syslog server which will receive these event logs. (Note: this option only available in software version 2.0 and above).

 # psctl –S 192.168.1.200

Version Info

The following command shows hardware and software versions and serial number of the switch.

 # psctl –V

Other Administrative commands

Most of other administrative functions can be done using standard Linux commands. For example, to change the password use "passwd" command from the Linux prompt and to add new user use "useradd" command. You have to be "root" user in order to add a new user.

psctl - Command Line Interface

You can get help of any *psctl* option by running the *psctl* command followed by the option itself. Most of the options have in built examples which shows the syntax. Some examples ….

$ *psctl -s 1 on* # Switch on the first outlet

$ *psctl -s 1 off* # Switch off the first outlet

$ *psctl -v* # Display the voltage

$ *psctl -t* # Display the internal temperature

$ *psctl -I 8* # Display the current on eighth outlet

$ *psctl -s all off* # Switch off all outlets

$ *psctl -O all* # Shows status of all outlets whether it is on (1) or off (0)

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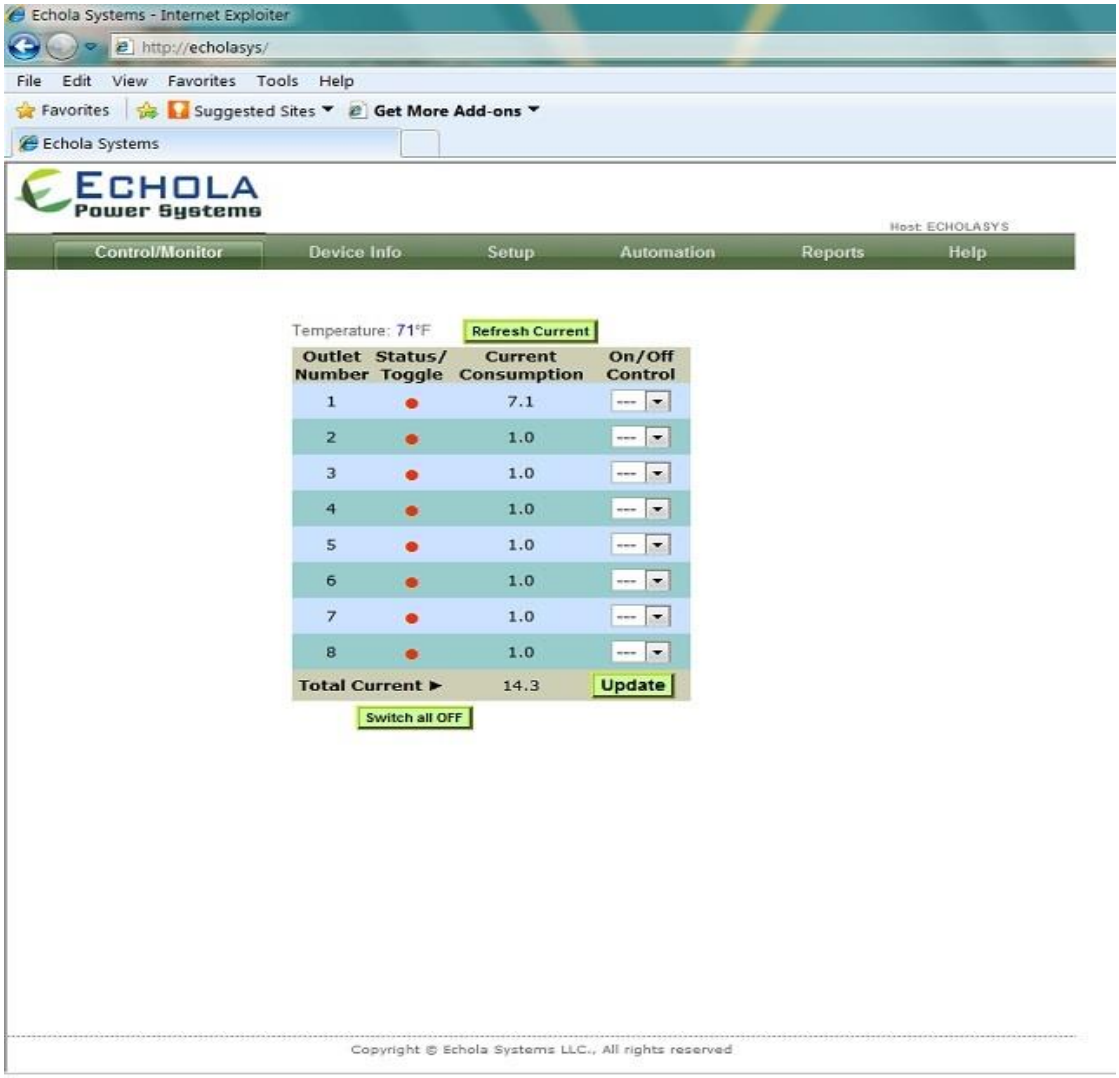
Web Interface

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.



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 sPDUspecific 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, o=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

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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

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
SNMPv2-SMI::enterprises.28465.3.2.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.3.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.4.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.5.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.6.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.7.0 = INTEGER: 1
```


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SNMPv2-SMI::enterprises.28465.3.8.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.9.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.10.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.11.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.12.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.13.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.14.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.15.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.3.16.0 = INTEGER: 1
SNMPv2-SMI::enterprises.28465.4.1.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.2.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.3.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.4.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.5.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.6.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.7.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.8.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.9.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.10.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.11.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.12.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.13.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.14.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.15.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.4.16.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.5.1.0 = STRING: " 0.0"
SNMPv2-SMI::enterprises.28465.6.1.0 = INTEGER: 0
SNMPv2-SMI::enterprises.28465.7.1.0 = STRING: "0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1"
SNMPv2-SMI::enterprises.28465.7.2.0 = STRING:
"0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0"

MIB File

You can download latest MIB file from

http://www.echola.com/power/Support.html

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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.

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