Server Technology
Solutions for the Data Center Equipment Cabinet

POPS™ Switched CDU®
(Per Outlet Power Sensing)

If you manage a datacenter, we have a solution for you.

How do I...

Monitor current, voltage, power (kW), apparent power, crest factor and power factor per device?

Monitor kW and kW-h power information per outlet, device, application (groups of devices), cabinet, or location?

Provide kW-h billing reports and trends per outlet, device, application (groups of devices), cabinet or location?

Measure IT Load for "green" efficiency metrics such as PUE and DCiE from The Green Grid and SI-POM and H-POM from The Uptime Institute?

Monitor input current using accurate Digital True RMS current monitoring?

POPS™ Switched CDU®

Provides power monitoring per individual outlet/device to monitor current, voltage, power (kW), apparent power, crest factor and power factor. This CDU also includes branch circuit protection, network power and environmental monitoring plus Remote Management, including Reboot Commands to connected servers and network equipment.

Sentry Power Manager (SPM)

SPM is a powerful tool which allows monitoring, control capabilities, and management of multiple CDU's in single or multiple locations. Features include alarm management, reporting and trending of kW & kW-h information that can be used for energy efficiency calculations, device monitoring and billing.

POPS CDU Product Family

Power Distribution Solutions for the Data Center Equipment Cabinet

Corporate Profile

Server Technology, Inc. is the global leader in power distribution units and power management products used in the world's leading enterprise data centers, service providers and branch office locations. For over 25 years, Server Technology has been recognized for innovative, intelligent power distribution, remote power monitoring and power management and measurement. Driven by customer innovation, the company is committed to helping companies reach their power consumption and green initiative goals.

Server Technology, Inc. is headquartered in Reno, Nevada with worldwide distribution and regional offices in the United Kingdom, Germany and Singapore. To contact Server Technology call +1.800.835.1515 or visit www.servertech.com

Certifications, Compliance & Warranty

All products contained within this brochure carry one or more of the certifications below. Additional agency certifications are available based on specific market requirements.

> US & Canada (cTUVus mark) to UL 60950-1:2003 and CAN/CSA 22.2 No. 60950-1-03
> European Union (TUVGS mark) to EN 60950-1:2001
> EMC – EN 55022 Class A, EN 55024
> CE
> 2 Year Warranty

Feature Key

The Sentry POPS Switched CDU product line features the following assets:

Flexible Mounting Options

Zero-U button or bracket mounting for mounting vertical CDU's in the back or on the side of the cabinet to avoid consuming valuable "U" space.

Branch Circuit Protection

All Sentry CDU's meet the UL 60950-1 requirement for branch circuit protection and use either fuses or circuit breakers to protect each branch of outlets.

Input Current Monitoring

The CDU's exclusive True RMS Current Monitoring is critical to preventing overloads in high-density computing environments. Digital LED displays on the CDU enclosure report the input current of each phase or branch circuit.

Environmental Monitoring

External probes, with 3-meter cable, capable of measuring temperature & humidity. Receive SNMP-based or email alert notifications when conditions exceed defined thresholds.

Expansion Module

Our exclusive method for linking additional outlets, on separate CDU's, together under a single IP address, and provides support for A & B power in-feeds.

IP Access, Security & Communications

Web interface, SSL, SSH, Telnet, SNMP and RS-232 access, 10/100 Base T-Ethernet, SSLv3/TLSv1, SNMPv2, TACACS+, LDAP, LDAPS, RADIUS, DHCP, SMTP/Email, and Syslog.

Individual Outlet Control

Control individual outlets or groups of outlets with ON, OFF, and Reboot functionality to remotely reboot unresponsive servers and network equipment.

POPS™ (Per Outlet Power Sensing)

Monitor Current Load (A), Voltage (V), Power (W), Apparent Power (VA), Crest Factor and Power Factor per outlet.

Cable Retention Clip

Ensures power cords to the connected devices are not accidently unplugged or disconnected.

POPS Switched CDU

Features and Anatomy

The complexity of IT equipment in today's data centers and remote branch office locations requires new solutions for building a solid infrastructure. It must support 24/7 operations and reduce the instance of locked-up or failing equipment leading to network downtime with the ability to measure and monitor the power of the IT equipment throughout the Data Center. Five nines availability — 99.999% uptime — demands it.

Blade servers and high density computing power requirements continue to increase, creating heat proliferation and more challenges for managing the IT environment. To maintain their competitive advantage, data center managers need solutions that monitor, track and manage servers and IT equipment and the equipment cabinet infrastructure that houses them.

Sentry : POPS™ Switched CDU®

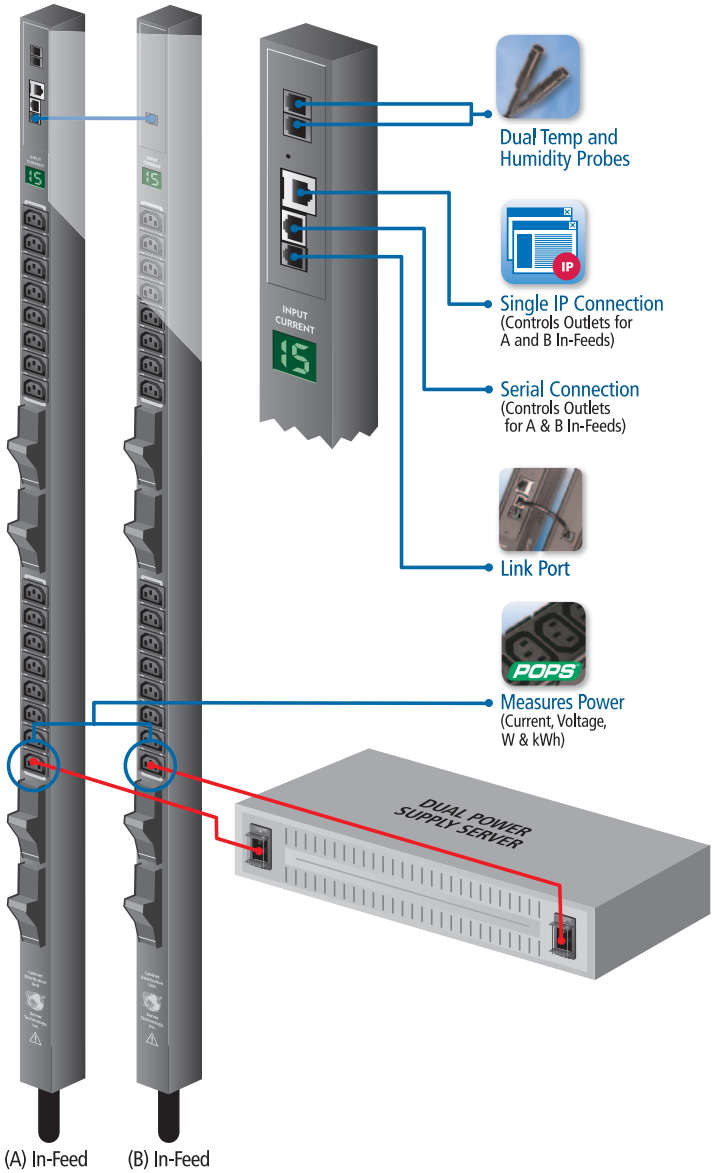
Switched Cabinet Power Distribution Unit plus Per Outlet Power Sensing (POPS)

The POPS Switched CDU products provide the capability to securely monitor power per individual outlet/ device. Power information per individual outlet /device includes current, voltage, power (kW), apparent power, crest factor, accumulated energy, and power factor. Using our grouping technology, power information is available per device, groups of devices (application), individual CDU or cabinet.

POPS Switched CDU's combine networked configuration and management with power distribution and power and environmental monitoring. The POPS Switch CDU enables you to: control cabinet power via a network; reboot a single or dual power server with one command; receive SNMP-based or email alerts when power or environmental conditions exceed thresholds; and assign access rights to user groups or individuals.

POPS Switched CDU products provide the flexibility needed for all data centers and remote sites, including power requirements for high-amperage and high-voltage, EN 60950-1:2001 Branch Circuit Protection, and SNMP traps and email alerts including current monitoring.

Diagram 1
Monitoring & Outlet Control



POPS Switched CDU

Access, Security and Communications

POPS Switched CDU

Integral Web Interface

The Sentry POPS CDU is capable of being accessed through either a secure network or serial connection. The secure integral web interface provides a simple and easy way to configure the CDU. Configuration choices include, SNMP traps, email alerts, grouping, and all security and communication settings.

Features

> Simple, secure, integral web interface GUI configuration tool

> Temperature and Humidity Support

> Authentication logging, configuration changes and system events

> Secure Syslog protocol support

> Email notifications of log, event, authorization, power and configuration messages

> Automatic Firmware Updates via FTP server

> Strong Password Support and Pre-Login Banner

> Ability to Ping an IP address to see if the device is responding

> Grouping of outlets across multiple CDU's

> SNMP: Traps based on Status, Changes, Load, Temperature and Humidity

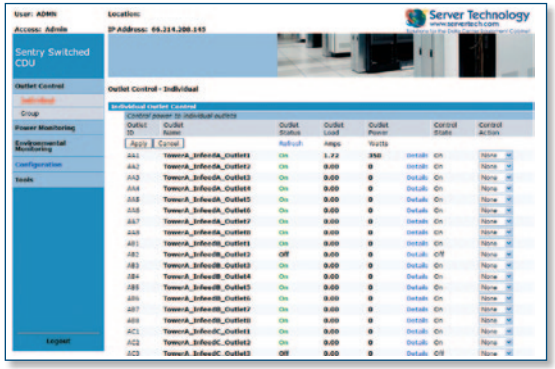
> Supports 104 user accounts and 18 simultaneous logins with a dedicated SNMP connection

Communication Tools

> Web Interface	> SSL	> LDAP
> SNMP & RS-232 access	> SSH	> LDAPS
> 10/100 Base T-Ethernet	> SSLv3/TLSv1	> RADIUS
> SMTP/Email	> SNMPv2	> DHCP
> Telnet	> TACACS+	> Syslog

Power Information & Management

Internal Web Interface



Outlet Control Power Monitoring

> Individual Outlet Control
> Current Load Monitoring
> Power Monitoring
> Additional Details

Per CDU Power Information

> Current Load
> Infeed Voltage (VAC)
> Input Feed Watts (W)
> System Total Watts (W)
> System Footprint (SqFt or SqM)
> System Watts (W per SqFt and/or Meter)

Grouped Outlets Power Information

> Device (Multiple Outlets)
> Group of Devices (Application)
> Cabinet (single IP address using master-expansion configuration for two CDUs)
> Individual CDU

Sentry POPS™ (Per Outlet Power Sensing)

> Current Load (A)	> Apparent Power (VA)
> Voltage (V)	> Crest Factor
> Power (W)	> Power Factor

POPS Switched CDU

Power Management Architecture

Power Information & Management

Sentry Power Manager

The Sentry POPS CDU is capable of being monitored and managed through the SPM (Sentry Power Manager) tool. Sentry POPS, in conjunction with SPM, provides additional power information including kW and kW-h information for billing purposes and power monitoring as well as trending and power reports. An API allows power and other information to be communicated to a Building Management (BMS) or other systems.

Sentry POPS and Sentry Power Manager (SPM) Tools

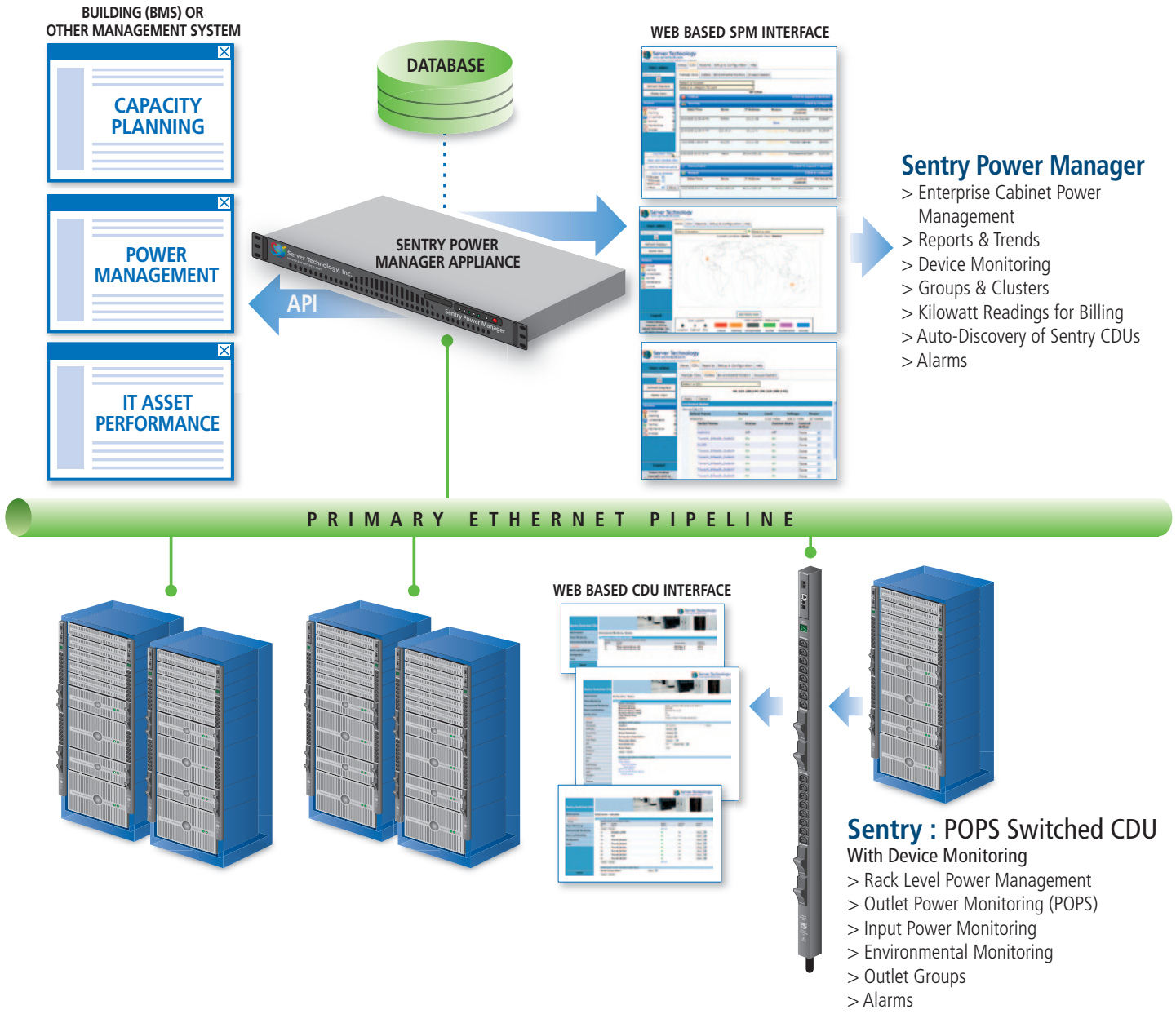
> kW reports and trends per outlet, device, groups of devices (application), and cabinet

> kW reports and trends per multiple cabinets or a location via our exclusive SPM "clustering" feature that allows power monitoring across multiple IP addresses

> Billing kW-h report and trends per outlet, device, groups of devices (application), cabinet and location (using clustering feature)

> Reports and trending of power information (kW & kW-h) per day, month and year

> The ability to export logging and trending information to your building management or other systems within your facility using an ODBC compliant database



Sentry Power Manager

> Enterprise Cabinet Power Management
> Reports & Trends
> Device Monitoring
> Groups & Clusters
> Kilowatt Readings for Billing
> Auto-Discovery of Sentry CDUs
> Alarms

Sentry : POPS Switched CDU

With Device Monitoring

> Rack Level Power Management
> Outlet Power Monitoring (POPS)
> Input Power Monitoring
> Environmental Monitoring
> Outlet Groups
> Alarms

POPS Switched CDU

Sentry Power Manager (SPM)

Sentry Power Manager

Manage Multiple CDU's Across Multiple Locations

Do you have multiple Sentry CDU's in one or more locations that you would like to access from one central point? Would you like one central location where all alarms can be viewed and logged for reporting, e-mail or SNMP trap notications? No problem! Our Sentry Power Manager (SPM) product is capable of monitoring and managing multiple Sentry devices in IP-based enterprise networks. SPM provides a global view of all Sentry CDU's with the ability to view devices based on their temperature, humidity, current and device status. Besides managing and monitoring all alarm conditions, this information can also be used to provide reporting and trending information for display within SPM or integrated with your existing Building Management System (BMS).

Event Notification

> Email notification via the CDU or SPM to multiple recipients when an event occurs
> SNMP traps via the CDU or SPM when an event occurs
> Auto-discovers each CDU for easy configuration
> Easily create a user interface that mirrors the physical deployment of the data center
> Quickly drill down from a global perspective to the rack's actual physical location if there is a problem (quickly identify the alarm and the physical location of the CDU)
> Create outlet clusters to group outlets within a CDU, across linked CDU's or across enterprise locations

Multiple Reporting Options

> Reporting capabilities to produce reports on critical management parameters such a temperature, humidity and current load
> Reports on current and power providing the power consumption of each input, total for the rack and/or per square foot of the rack

On-Demand Accessibility

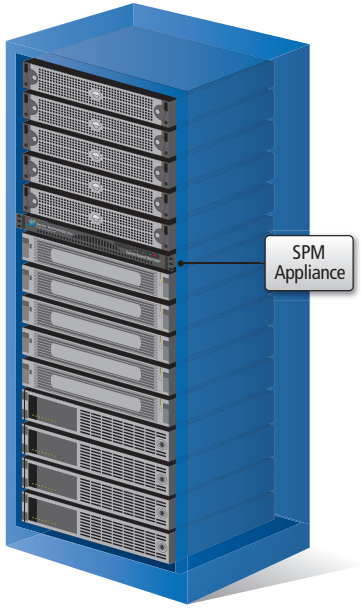
> Real-time view of all active system alarms
> Anytime, anywhere web-based views
> Manage thousands of CDU's from a single console

Compatibility

> Server Technology Sentry CDU's with firmware 5.3+

Web Browsers Supported

> Microsoft Internet Explorer 7.0+
> Mozilla Firefox 2.0+



Web Based GUI: Quickly drill down from a global view to the rack level

Rack Mount SPM Appliances

1U SPM standard and 1U SPM redundant appliances.

SPM Standard (Front)

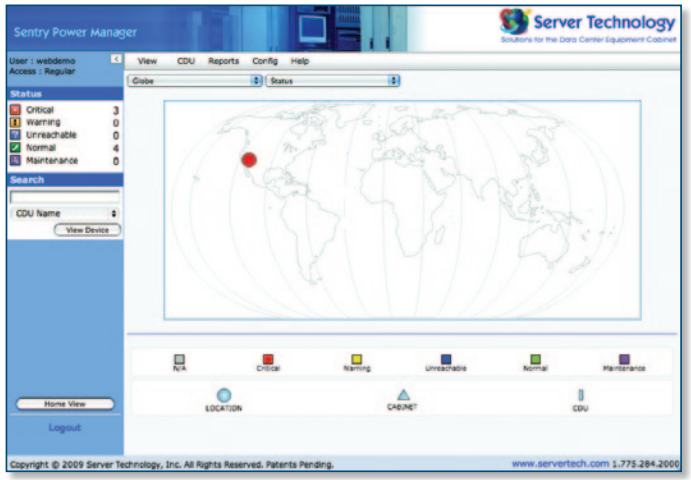
SPM Standard (Back)

SPM Redundant (Front)

SPM Redundant (Back)

POPS Switched CDU

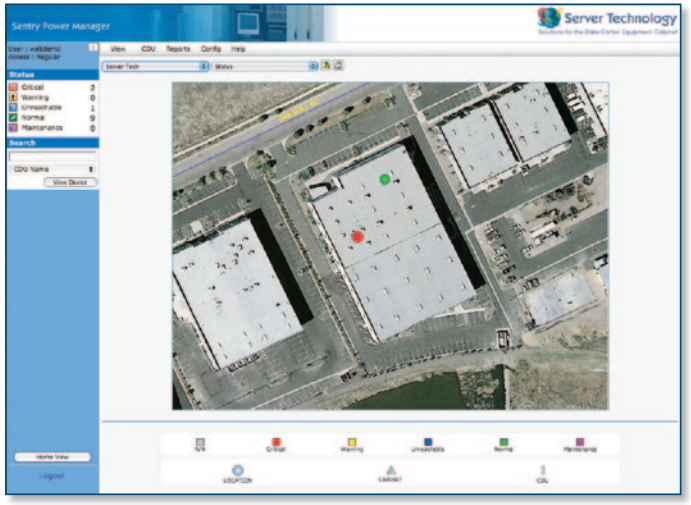
Sentry Power Manager and Expansion Modules



Home Page

> Multiple Views per status, power, temperature, humidity & capacity

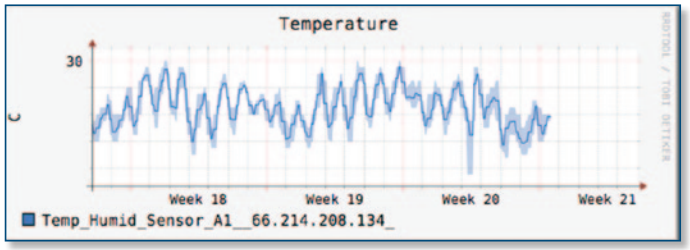
> Alarm status > Search box

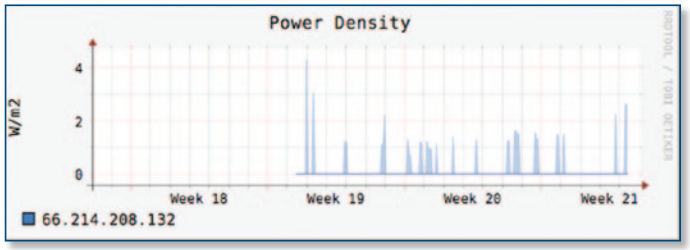


Views

> Environmental, power, and capacity information

> Power density > Status

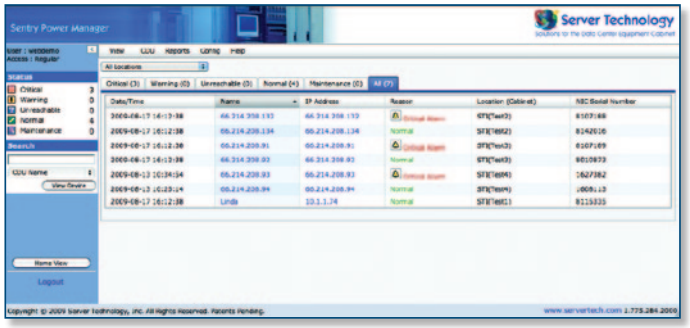




Trends

> Power, temperature and humidity > Select up to 10-items

> Period: 24-hours to 3-years



Alarm Details

> CDU to maintenance mode > View and control CDU

> Overview and detailed alarm information

Linkable Expansion Module

The Expansion Module CDU, POPS CXG, is our exclusive method for linking together outlets on different power circuits.

The Expansion Module CDU,CXG, increases the number of managed outlets on a single IP address. Each expansion module links to its parent POPS CWG, which contains both network and serial interfaces. When linked to POPS CDU, the CXG's outlets are auto-discovered by the POPS CDU's firmware, and all available outlets are viewable through the firmware.

On the POPS Switched CWG, outlets are individually controllable, or groups of outlets can be controlled between the POPS Switched CWG and CXG with one command. Each Expansion Module CDU can be a single or dual-power feed and have a Zero-U or horizontal enclosure.

A-Feed (CWG) B-Feed (CXG)

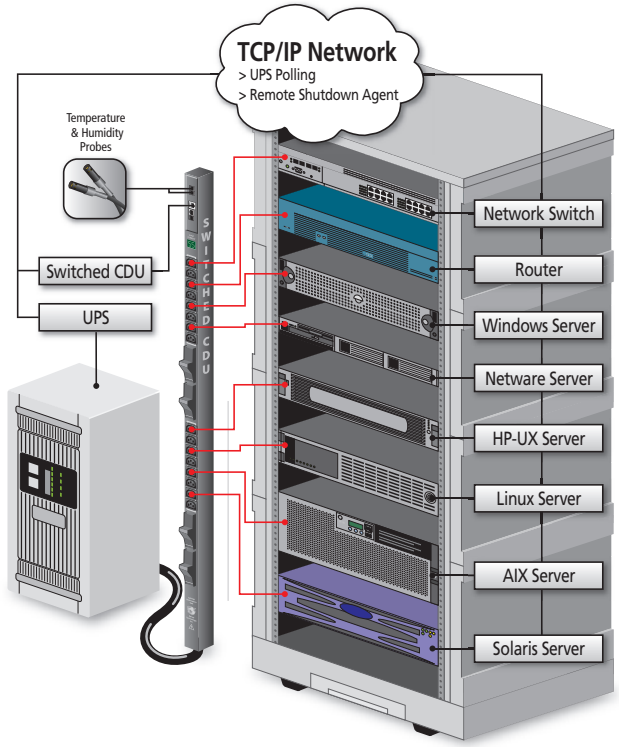
POPS Switched CDU

Smart Load Shedding and Integral Network Administration Interface

Sentry Smart Load Shedding

Load Management based on Temperature, In-feed Load, and UPS Status

Server Technology is the first to offer datacenter managers the ability to automatically manage Switched CDU power outlets based on key operating parameters, including temperature, in-feed load, and UPS power status. Each outlet may be controlled by one or more of these parameters. Should the temperature or load current exceed defined thresholds or the UPS lose power and go onto battery, all or a portion of the loads may be automatically shed to ensure longer operational life of your critical devices.



Features

> Easy to use, integral, web based GUI configuration tool

> "Auto-recovery" with a reboot delay time when conditions return to normal

> Each CDU outlet is assigned the IP address of the connected device for shut down notification

> Remote shutdown agent for server shut down

> SNMP trap notifications

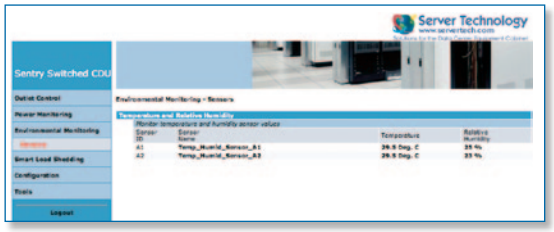
> Load shedding event notifications via SNMP traps or Email alerts

Sentry Access, Security & Communication

Integral Web Interface

Web Based GUI: Individual Outlet Control Screen

Web Based GUI: System Configuration Screen



Web Based GUI: Environmental Monitoring Screen

Features

> Secure, web based GUI configuration tool

> Temperature support (celsius/fahrenheit) and humidity (%)

> Logs authentications, configuration changes and system events

> SNMP and email notifications for multiple users of log, event, power, and authorization, configuration messages

> Syslog logging protocol support

> Automatic firmware ppdates via FTP

> Strong password support and pre-login banner

Power Information

> Input Feed Voltage (VAC)

> Input Feed Watts (W)

> System Total Watts (W)

> System Footprint (SqFt / SqM)

> System Watts/Area (W/SqFt / W/SqM)

Communication Tools

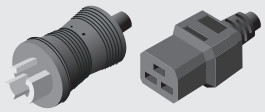
> Web interface, SSL, SSH, Telnet, SNMP & RS-232 access, 10/100 Base T-Ethernet, SSLv3/TLSv1, SNMPv2, TACACS+, LDAP, LDAPS, RADIUS, DHCP, SMTP/Email, and Syslog.

POPS Switched CDU

Plug and Cord Options for Sentry CDU's

Server Technology provides 20A, 30A, and 60A products with a variety of input cord options available. Please refer to the Power Cords and cordset options below for different configurations. Shown below are standard power cord and cordset options.[1] [2]

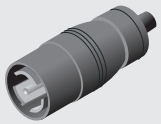
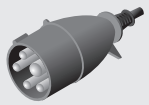
20A Plugs & Cords

Model	PTCORD-1	Hard-Wired	Hard-Wired
Outlets	NEMA L6-20P to IEC 60320/C19	NEMA L15-20P	NEMA L21-20P
Voltage (V)	208-240V	3-Phase 208V, Delta	3-Phase 208V, Wye
Amps (A)	20A	20A	20A
Length	10' | 3m	10' | 3m	10' | 3m
			

30A Plugs & Cords

Model	Hard-Wired	Hard-Wired	Hard-Wired	Hard-Wired
Outlets	NEMA L6-30P	NEMA L15-30P	NEMA L21-30P	NEMA L22-30P
Voltage (V)	208-240V	3-Phase 208V, Delta	3-Phase 208V, Wye	277/480V, Wye
Amps (A)	30A	30A	30A	30A
Length	10' | 3m	10' | 3m	10' | 3m	10' | 3m
				

50A & 60A Plugs & Cords

Model	Hard-Wired	Hard-Wired	Hard-Wired
Outlets	CS8365C	IEC 60309 (4pin, 9hr)	IEC 60309 (5pin, 9hr)
Voltage (V)	3-Phase 208-240V	3-Phase 208-240V, Delta	3-Phase 208V, Wye
Amps (A)	50A	60A	60A
Length	10' | 3m	10' | 3m	10' | 3m
			

[1] Server Technology offers a wide range of products for North America and global markets. For more information on global products visit our website at www.servertech.com [2] Custom cable lengths available; contact a Server Technology Power Expert to determine the correct solution.

POPS Switched CDU

Zero-U Vertical Enclosures

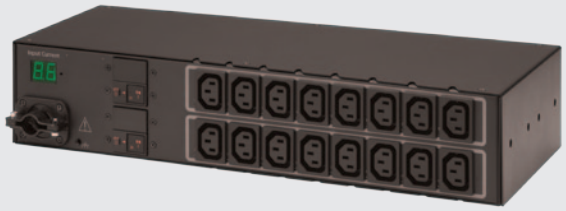
Model	CWG-16V2	CWG-16VE	CWG-24V2	CWG-24VE	CWG-24VD/Y	CWG-24V4	CWG-24V5	CWG-24VD/VY
Outlets	(12) C13 + (4) C19	(12) C13 + (4) C19	(18) C13 + (6) C19	(18) C13 + (6) C19	(18) C13 + (6) C19	(18) C13 + (6) C19	(18) C13 + (6) C19	(18) C13 + (6) C19
Input Voltage (V)	208-240V	230V	208-240V	230V	3-Phase 208-240V	3-Phase 230/400V	3-Phase 240/415V	3-Phase 208-240V
Amps (A)	20A or 30A	16A or 32A	20A or 30A	16A or 32A	20A or 30A	16A or 32A	20A or 30A	50A or 60A
Cabinet kW	4.2kW or 6.2kW	3.6kW or 7.3kW	4.2kW or 6.2kW	3.6kW or 7.3kW	7.2kW or 10.7kW	11kW or 22kW	14.4kW or 21.6 kW	18kW or 21.6kW
Output Voltage (V)	208-240V	230V	208-240V	230V	208-240V	230V	240V	208-240V
Dimensions	29U | 49.4" | 1256mm	29U | 49.4" | 1256 mm	40U 69" | 1753mm	40U | 69" | 1753mm	40U | 69" | 1753mm	40U | 69" | 1753mm	40U | 69" | 1753mm	40U | 70" | 1778mm

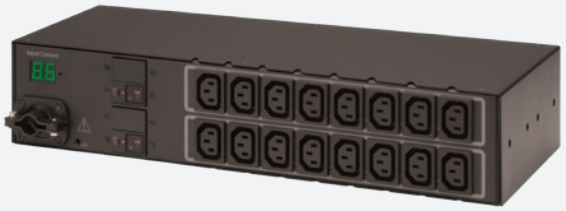
POPS Switched CDU

Horizontal Rack Mounted Enclosures

Model	CWG-8H2	CWG-8HE
Outlets	(8) C13	(8) C13
Input Voltage (V)	208-240V	230V
Amps (A)	20A or 30A	16A or 32A
Cabinet kW	4.2kW or 6.2kW	3.6kW or 7.3kW
Output Voltage (V)	208-240V	230V
Dimensions	1U | 7.1" | 181mmDepth	1U | 7.1" | 181mm Depth

Model	CWG-16H2	CWG-16HE
Outlets	(16) C13	(16) C13
Input Voltage (V)	208-240V	230V
Amps (A)	20A or 30A	16A or 32A
Cabinet kW	4.2kW or 6.2kW	3.6kW or 7.3kW
Output Voltage (V)	208-240V	230V
Dimensions	2U | 7" | 178mm Depth	2U | 7" | 178mm Depth





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