



Instruction Manual
Rack Power Distribution Unit

RCX, RCM-O and RCU-O Series
Firmware Version 3

Contents

Contents	2
Specifications	4
Overview	4
Environmental	4
Electrical	4
Receptacle Ratings	4
Networking	4
Data Formats	5
EMC Verification	5
Installation	6
Guidelines	6
Mounting	7
Network Overview	13
Default IP Address	13
Initial Setup	14
Web Interface	16
Overview	16
Sensors Page	16
Logging Page	18
Display Page	19
Alarms Page	20
Control Page (RCM-O and RCU-O Only)	21
Configuration Page	23
Unit Configuration	28
Network Configuration	28
Time and Date	29
E-Mail/ Business Hours	30
SNMP	31
Accounts and Passwords	32
Telnet	33
Camera Configuration	33
Admin Information	34
Kilowatt-Hours Reset	34
XML File Backup	35
SSL Certificate Upload	35
Alarms	36
Alarm Notifications	36
Alarm Types	36
Thresholds	36
Sensors	38
Overview	38
Internal Sensors	38
Remote Sensors	39
Data Logging and Display	40
Remote Outlet Switching (RCM-O and RCU-O Only)	41
Actions	41
Configuration	42
Power-On Actions	42
Accessories	43
Serial Communication (Delta Configured Units Only)	43
RSD2X8 Remote Display	43
IP-Addressable Network Cameras	43

RSC Integration	44
Alternate Data Formats	44
Technical Support	45
Firmware Version	45
Firmware Updates	45
Resetting PDU	45
Service and Maintenance	45
More Technical Support	45
Table of Figures	46
Revision History	47

Specifications

Overview

The RCM-O, RCU-O and RCX series units are rack level PDUs with circuit monitoring via a built-in web server. In the RCX series, built-in sensors monitor Voltage, Current, instantaneous and cumulative Power, as well as calculated Power Factor. The RCM-O series units have all these sensors plus outlet level switching, while RCU-O series units are the same as the RCM-O with added outlet level current and power monitoring. Web pages, including graphs, are generated by the unit to monitor power and environmental conditions within the cabinet. No software other than a web browser is required for operation and several data formats are available. Optional external sensors and network cameras are also available. These units can be built for installation in either Delta or Wye building wiring configurations.

Environmental

Temperature

Operating (Vertical):	10°C (50°F) min	40°C (104°F) max
Operating (Horizontal):	10°C (50°F) min	45°C (113°F) max
Storage:	-25°C (-13°F) min	65°C (149°F) max

Humidity

Operating:	5% min	95% max	(non-condensing)
Storage:	5% min	95% max	(non-condensing)

Elevation

Operating:	0 m (0 ft) min	2000 m (6561 ft) max
Storage:	0 m (0 ft) min	15240 m (50000 ft) max

Electrical

See nameplate for unit ratings.

Receptacle Ratings

NEMA 5-15R or L5-15R	125 Volts, 15 Amp
NEMA 5-20R or L5-20R	125 Volts, 20 Amp
NEMA 6-20R or L6-20R	250 Volts, 20 Amp
NEMA L5-30R	125 Volts, 30 Amp
NEMA L6-30R	250 Volts, 30 Amp
NEMA L15-30R	250 Volts (3 phase), 30 Amp
IEC-320 C13	125/250 Volt, 15 Amp (per Receptacle Bank)
IEC-320 C19	125/250 Volt, 20 Amp

Networking

Protocols

HTTP, HTTPS (SSL/TLS), SMTP, POP3, ICMP, DHCP, TCP/IP, NTP, Telnet, Syslog

Ethernet Link Speed

10 Mbit; half-duplex

Data Formats

HTML, SNMP, CSV/Plain Text, XML

EMC Verification

This Class A device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Installation

Guidelines

- If the PDU is installed in a cabinet the ambient temperature of the rack should be no greater than the PDU's maximum rated operating temperature.
- Install the PDU such that the amount of airflow required for safe operation of equipment is not compromised.
- Mount the PDU so that a hazardous condition is not achieved due to uneven mechanical loading.
- Follow nameplate ratings when connecting equipment to the branch circuit. Take into consideration the effect that overloading of the circuits might have on over-current protection and supply wiring.
- The PDU relies on the building installation for protection from over-current conditions. A Listed circuit breaker is required within the building installation. The circuit breaker should be sized according to the PDU's nameplate ratings and local/national electrical codes.
- Reliable earthing of rack-mount equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit. The PDU must be connected to an earthed socket-outlet.
- The PDU is intended for Restricted Access Locations only and only service personnel should install and access the PDU.
- For pluggable equipment, install the PDU so that the input plug or appliance coupler may be disconnected for service.
- Sequential power-up via Power-On Actions of devices powered by the PDU is recommended to avoid high inrush current. See Power-On Actions (page 42) for details.
- **Caution:** Disconnect all power cords before servicing.

Mounting

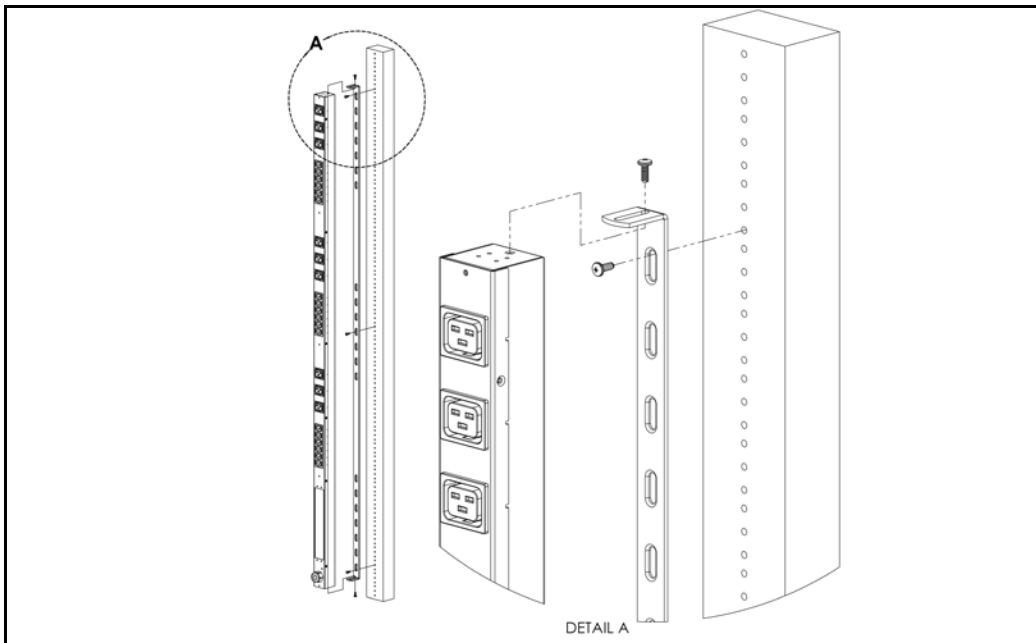


Figure 1: Full Length Bracket

Using the full length bracket, mount PDU to rack as shown

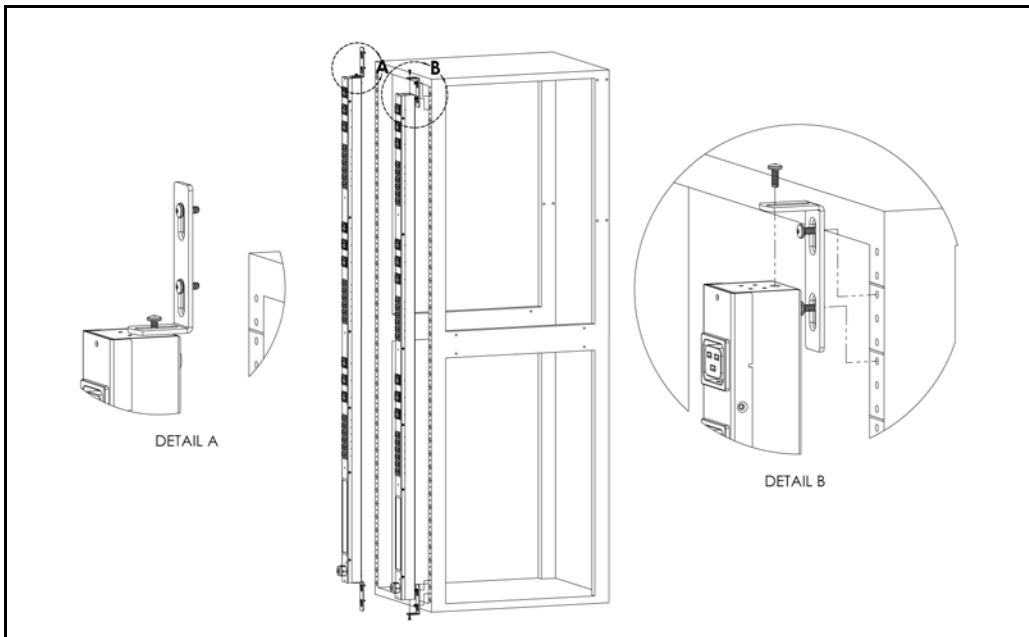


Figure 2: Mini "L" Brackets

Using the mini "L" brackets, attach PDU to rack as shown

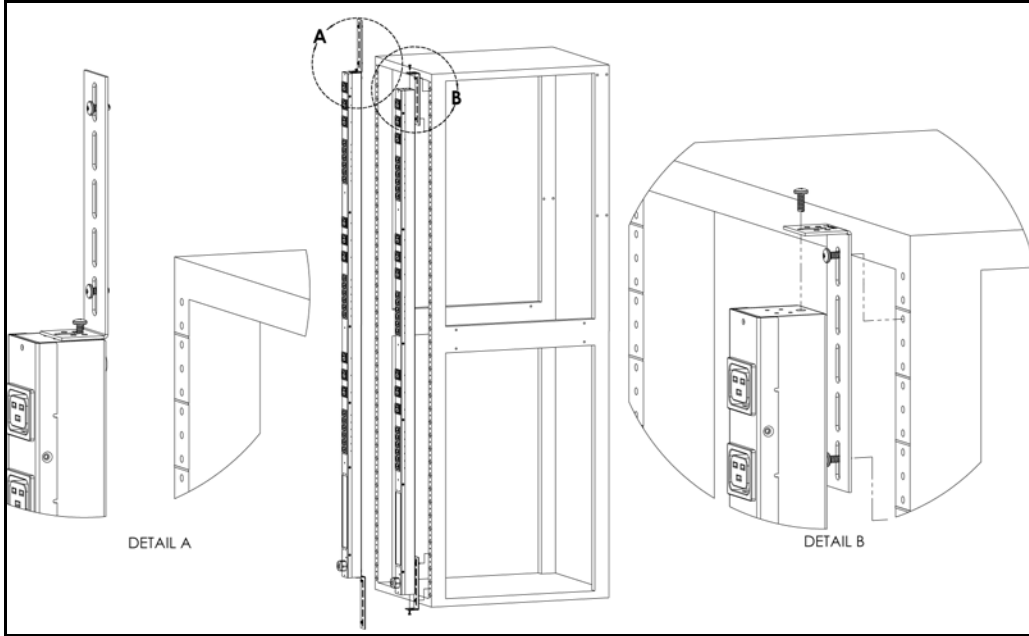


Figure 3: Vertical Extension Brackets

Using the vertical extension brackets, attach PDU to rack as shown

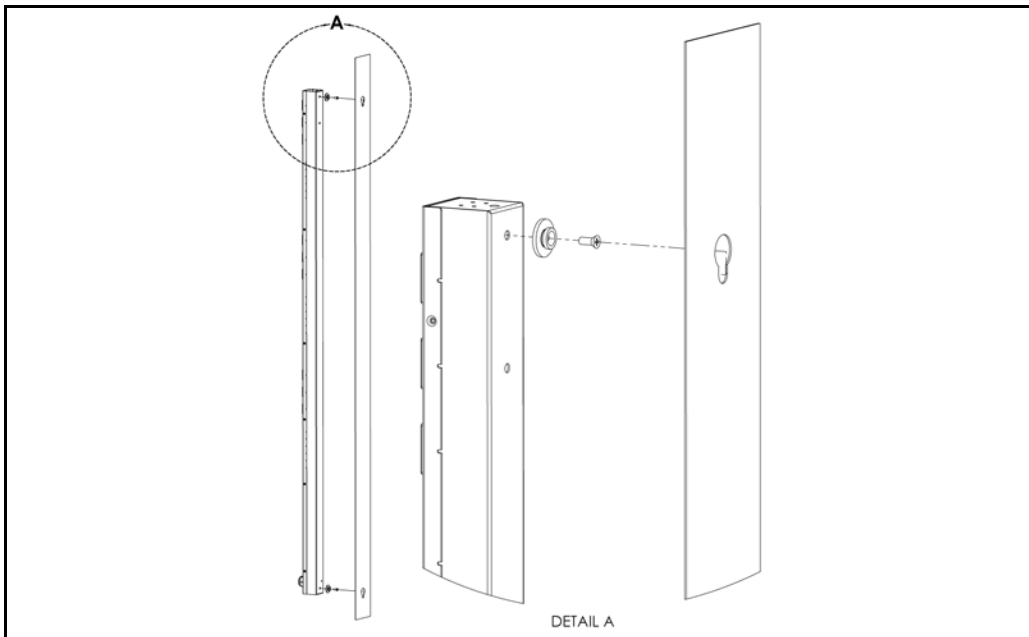


Figure 4: Toolless Mounting Hardware

Secure toolless mounting buttons to PDU as shown. Use toolless buttons with key-holed slots built into cabinet or with optional Geist key-holed brackets.

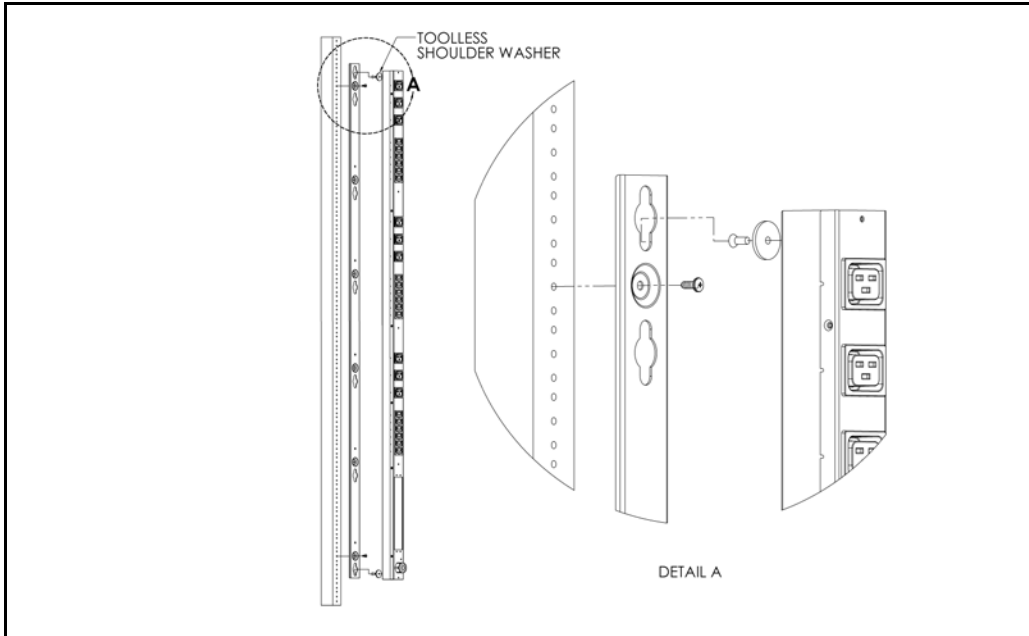


Figure 5: Toolless Full Length Bracket

Using full length toolless bracket and toolless mounting buttons, attach PDU to rack as shown

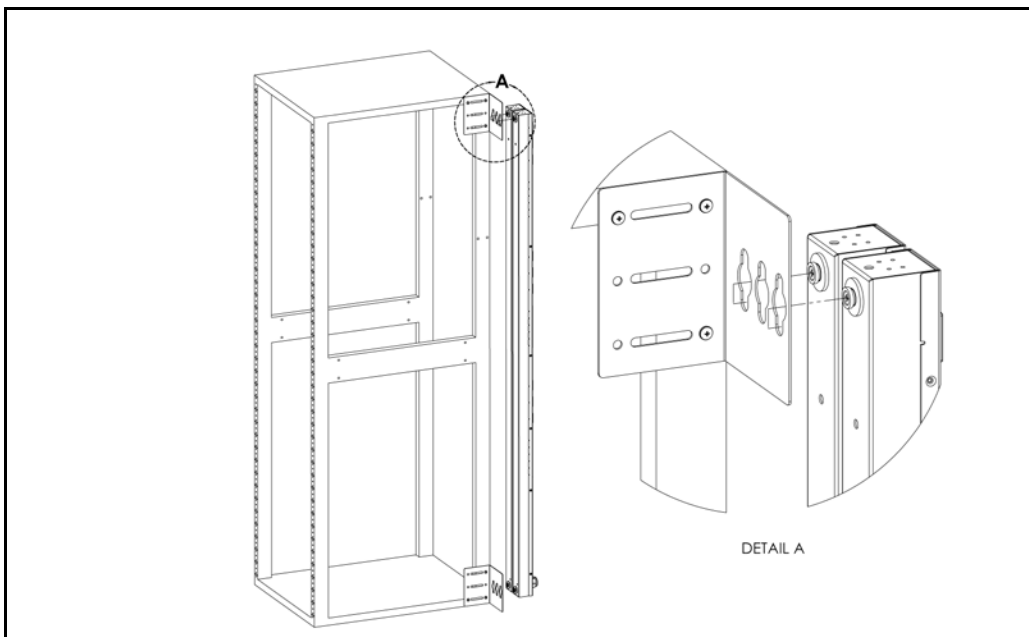


Figure 6: Single Side Mount 2 Unit Brackets

Using single side mount 2 unit brackets and toolless mounting buttons, attach PDU to rack as shown

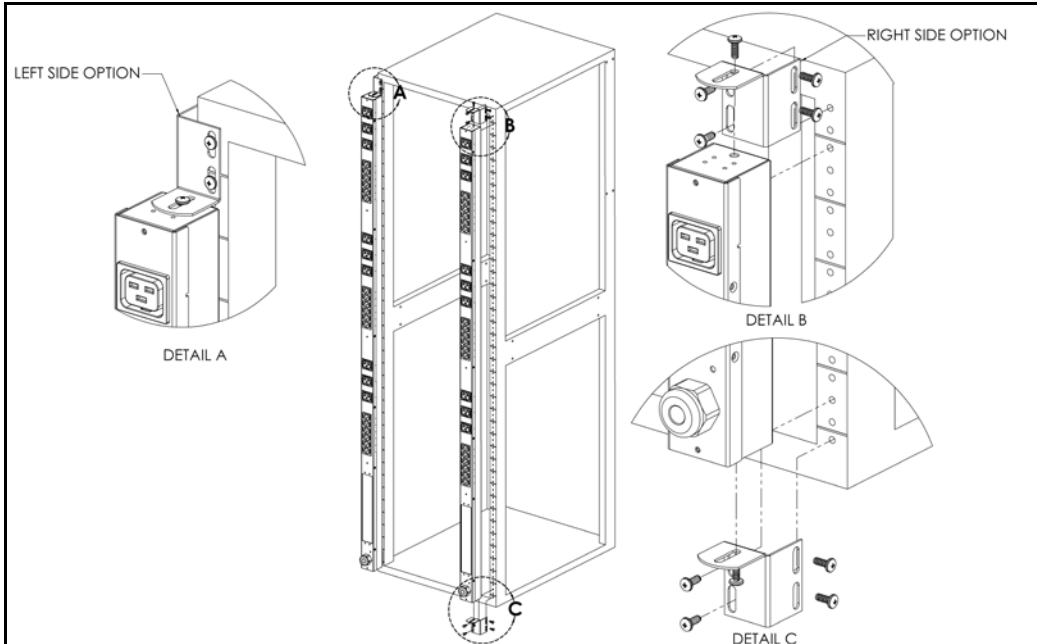


Figure 7: Offset/Side Mount Brackets

Using the offset/side mount brackets, attach PDU to rack as shown.

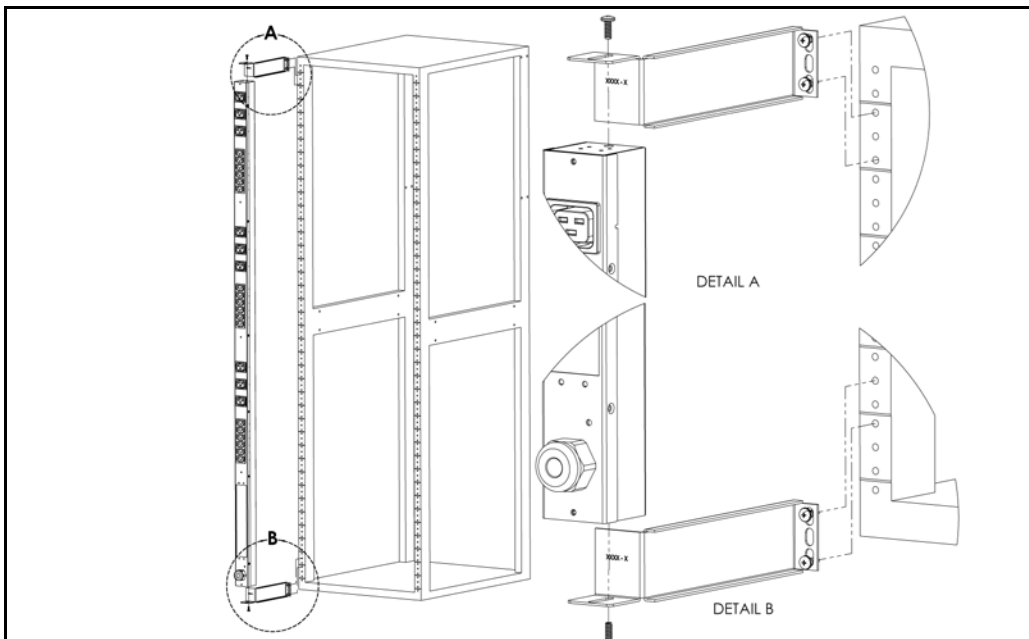


Figure 8: 7" Extension Brackets

Using the 7" extension brackets, attach PDU to rack as shown

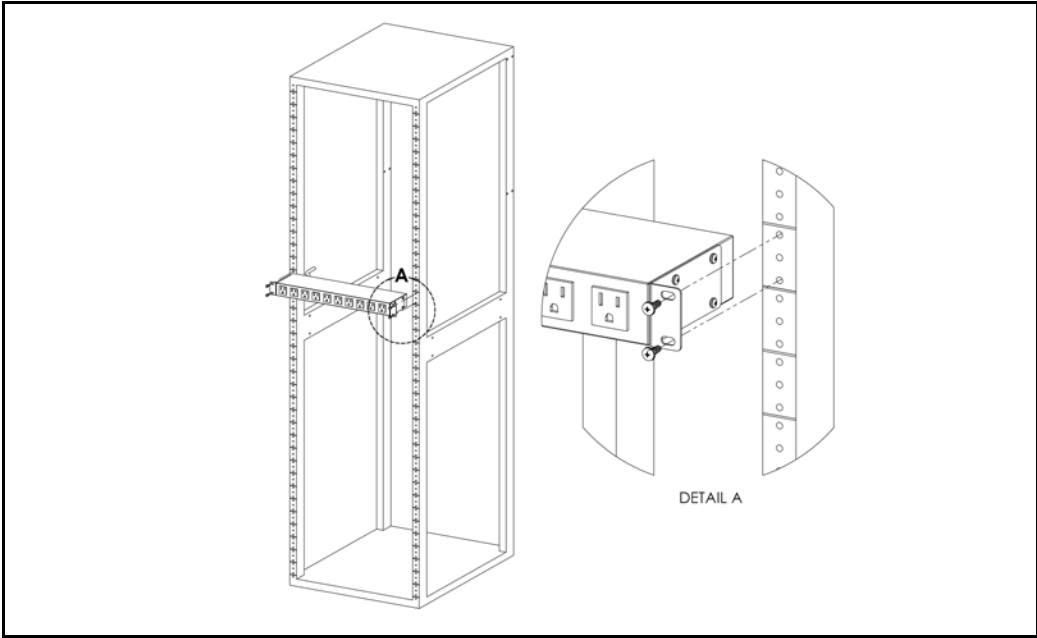


Figure 9: Flush Mount Brackets

Using flush mount brackets, attach PDU to rack as shown

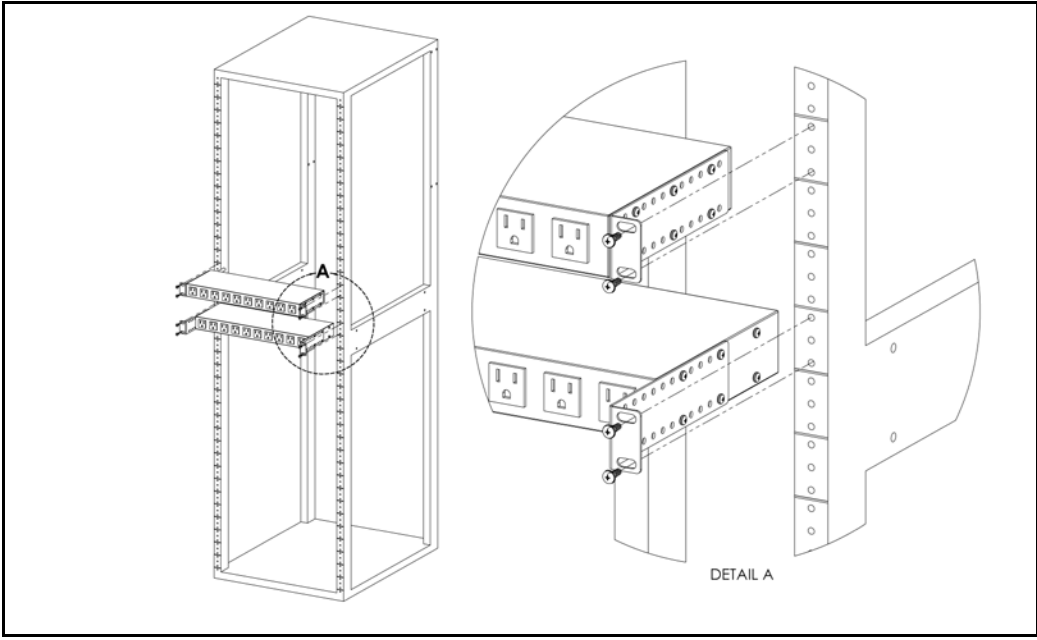


Figure 10: Adjustable Mount Brackets

Using adjustable mount brackets, attach PDU to rack as shown

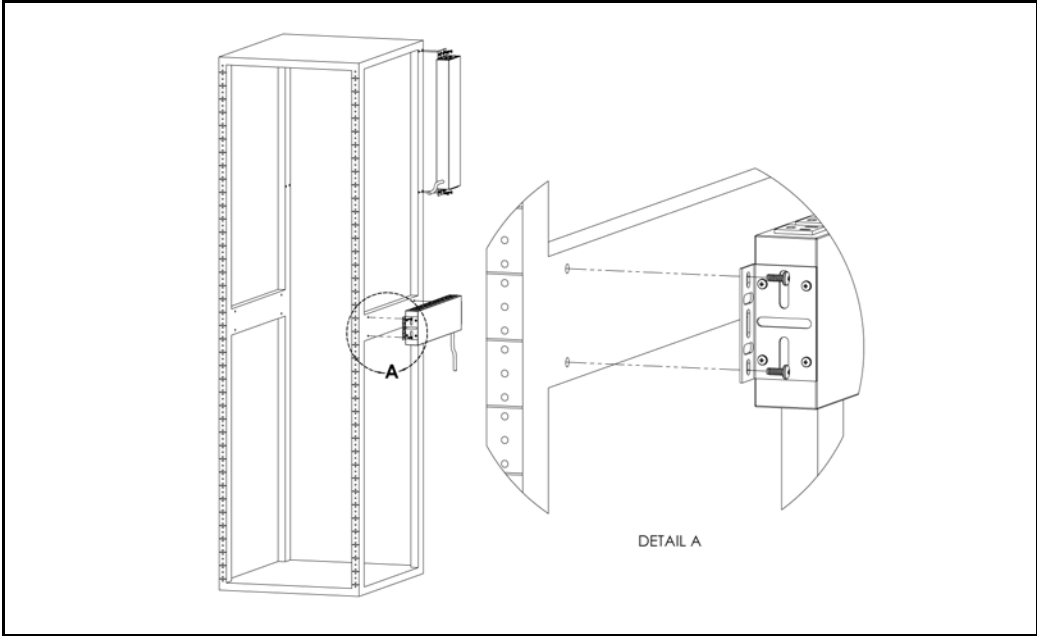


Figure 11: Panel Mount Brackets

Using panel mount brackets, attach PDU to rack as shown

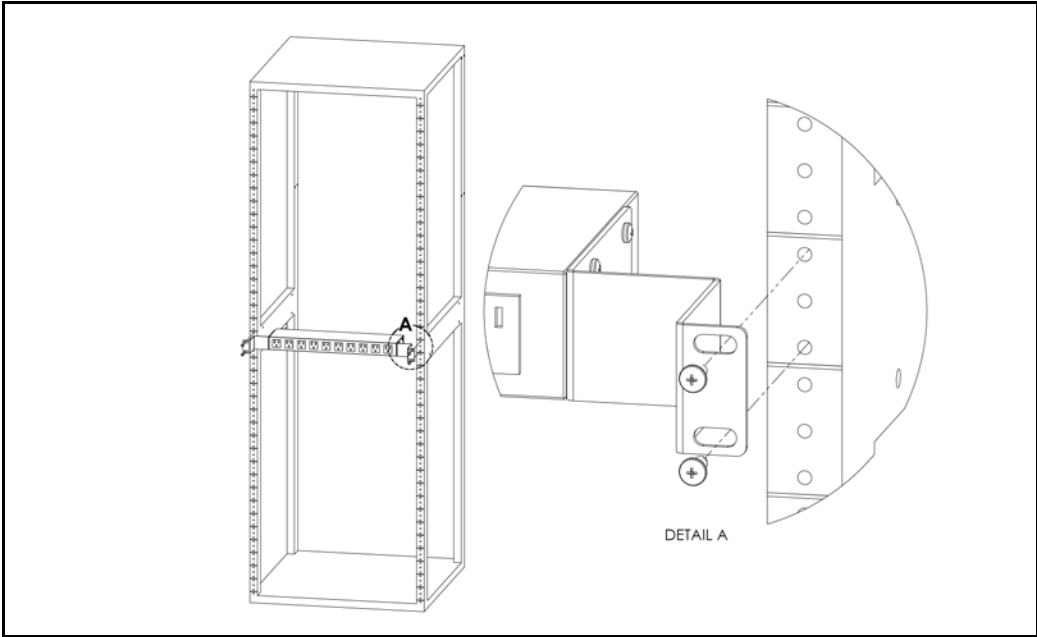


Figure 12: 23" Conversion Mounting Brackets

Using conversion mounting brackets, attach 19" PDU to 23" rack as shown

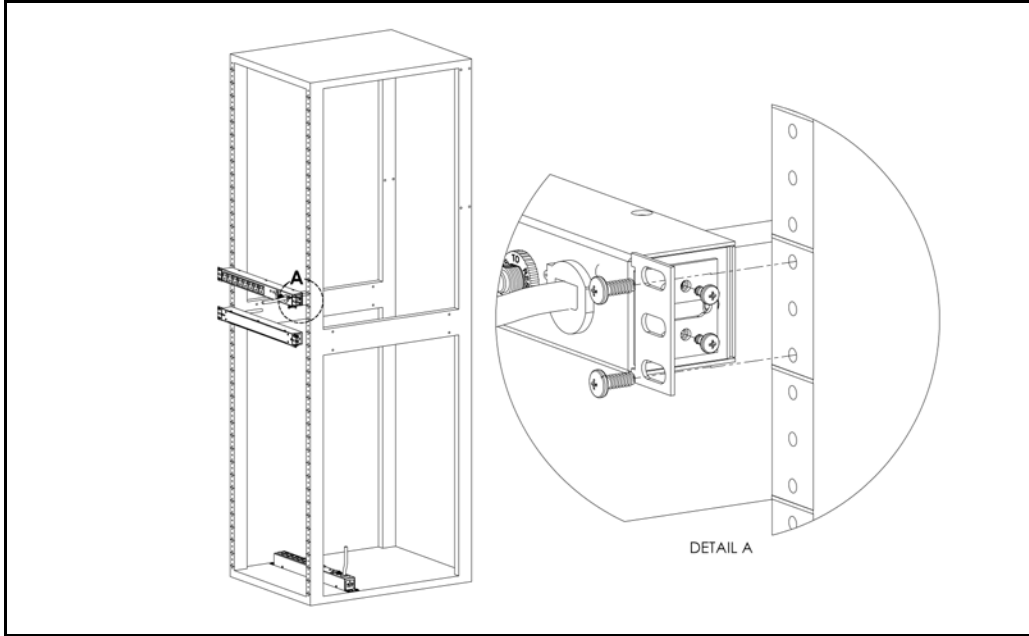


Figure 13: 19" Horizontal/Panel Mount Brackets

Using the 19" horizontal/panel mount brackets, attach PDU to rack as shown

Network Overview

This product comes preconfigured with a default IP address set. Simply connect to the PDU and access the web page with your browser.

Default IP Address

RCX, RCM-O and RCU-O units have a default IP address for initial setup and access to the unit if the assigned address is lost or forgotten. Once an IP address is assigned to a unit, the default IP address is no longer active. To restore the default IP address, press and hold the reset button located below the network connector for 20 seconds while the unit is powered up. The Idle and Activity lights next to the network connector will both light up when the IP address has been reset. The reset button is accessed through the white, circular hole located below the Ethernet jack.

Note: Pressing the reset button under the network connector will restore the default IP address and will also clear all password settings.

The Configuration page allows you to assign the network properties or use DHCP to connect to your network. Access to the unit requires the IP address to be known, so use of a Static IP or reserved DHCP is recommended. The default address is shown on the front of the unit:

- **IP Address:** 192.168.123.123
- **Subnet Mask:** 255.255.255.0
- **Gateway:** 192.168.123.1

Initial Setup

Connect the RCX, RCM-O or RCU-O series unit to your computer using a crossover cable or hub/switch.

Windows XP

On your computer, go to "Start > Settings > Control Panel > Network and Dial Up Connections"

Right click on "Local Area Connection" and select "Properties"

Select "Use the following IP address". Use these settings:

- **IP Address:** 192.168.123.1
- **Subnet Mask:** 255.255.255.0
- **Gateway:** Leave blank

Click "OK" twice.

The unit should now be accessible in a web browser via the unit's permanent IP address: <http://192.168.123.123/>. See Unit Configuration (page 28) for details.

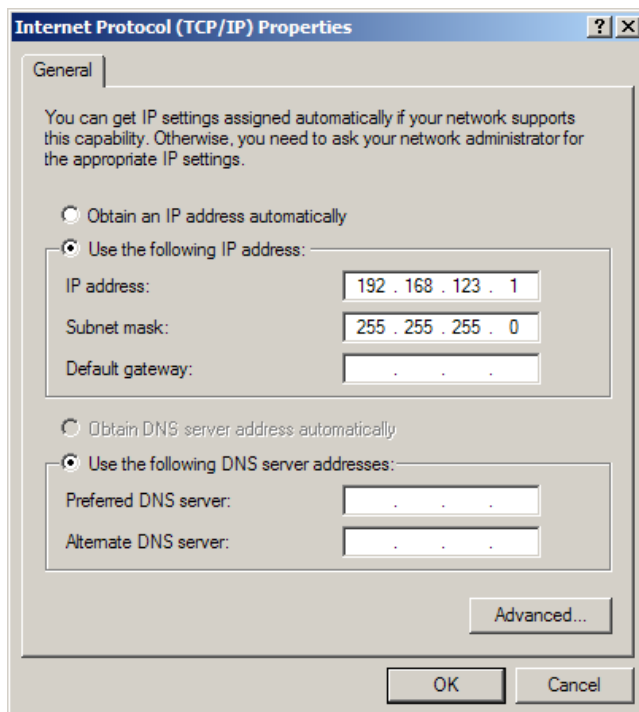


Figure 14: Windows XP network settings for initial setup.

MacOS X 10.5 and 10.6

Open System Preferences via the Dock or the Apple menu.

Select "Network" under "Internet & Network."

Select "Ethernet" from the list on the left side of the window and enter these settings on the right side of the window:

- **Configure:** Manually
- **IP Address:** 192.168.123.1
- **Subnet Mask:** 255.255.255.0
- **Router:** Leave blank

Hit "Apply" and confirm the changes.

The unit should now be accessible in a web browser via the unit's permanent IP address: <http://192.168.123.123/>. See Unit Configuration (page 28) for details.

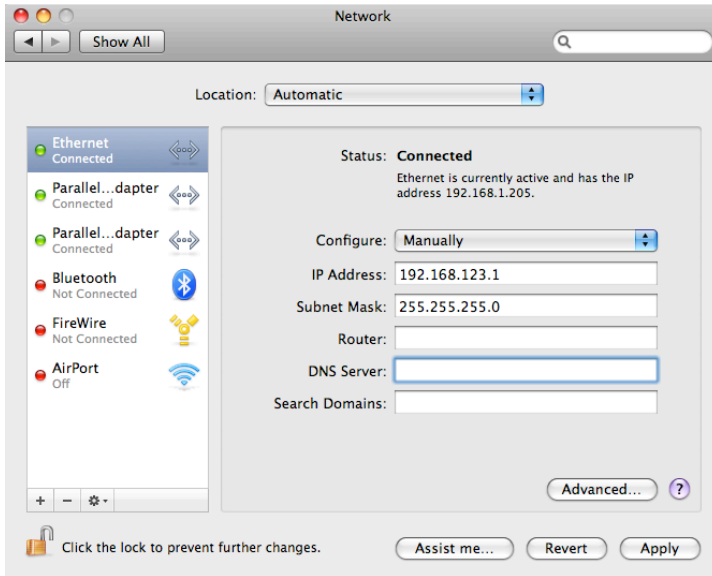


Figure 15: MacOS X network settings for initial setup

Note: Problems connecting to the local PDUs may be caused by the use of proxy servers. Turn off "Use a proxy server for your LAN" or select "Bypass proxy server for local addresses" under your web browser's LAN settings.

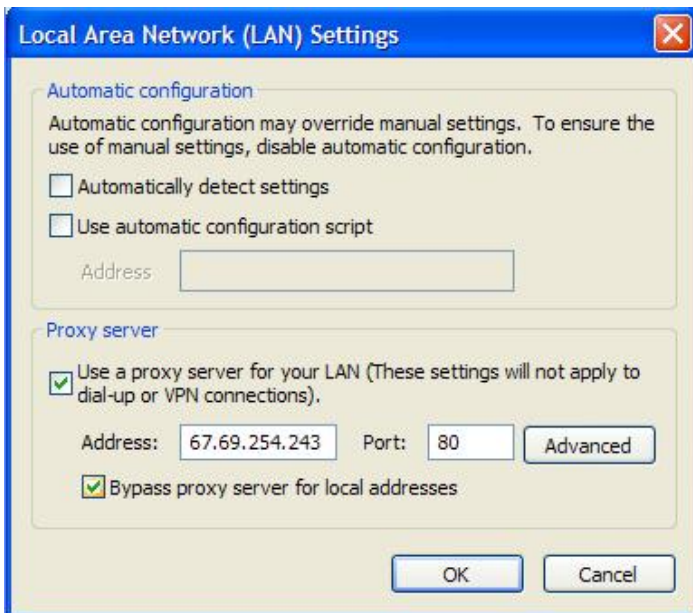


Figure 16: Internet Explorer's LAN Settings for selecting proxy settings

Web Interface

Overview

The unit is accessible via a standard, unencrypted HTTP connection as well as an encrypted HTTPS (SSL) connection. The following web pages are available:

Sensors Page

The front page, *Sensors*, gives both instantaneous and historical views of the unit's data. Real time readings are provided for all power strip data, outlet group data (RCU-O only), and sensor data next to historical graphs.

For units configured for Wye wiring all readings are based on the line currents; A, B, C.

For units configured for Delta wiring current readings are based on input line current (A, B, C). All other readings (Voltage, Real/Apparent Power, Power Factor and kWatt-Hours) are based on the Phase-to-Phase Load (AB, BC, CA).

Optional cameras may be added and their live snapshots are shown on this page. Plug-and-play sensors appear below the internal sensors when attached.

The menu bar allows access to the rest of the PDU's functionality. Alternate formats for the real-time data can be downloaded in PDA, XML and SNMP formats, and historical data is available in PDA format.

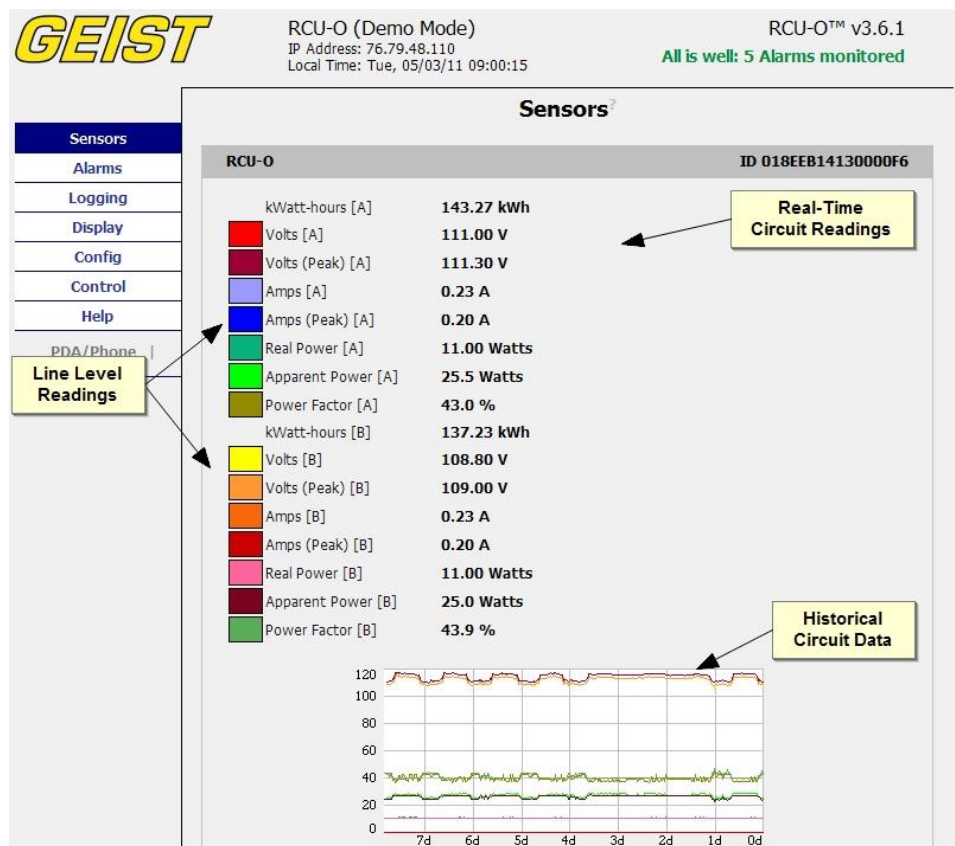


Figure 17: Sensors Page – Wye Configuration

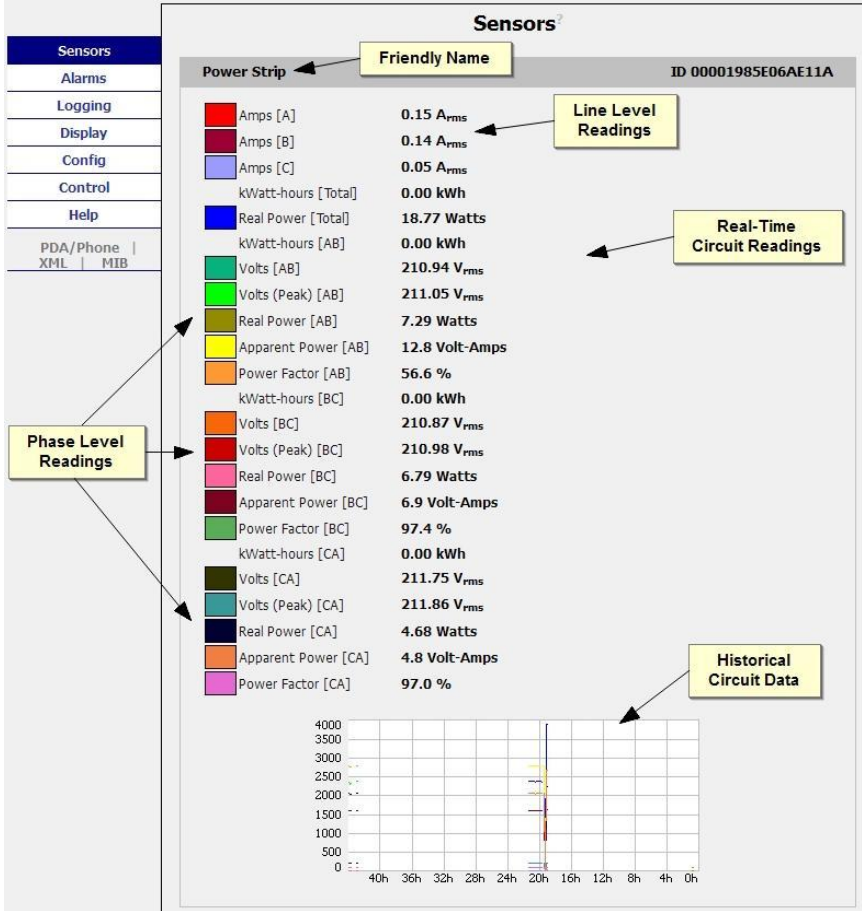


Figure 18: Sensors Page – Delta Configuration

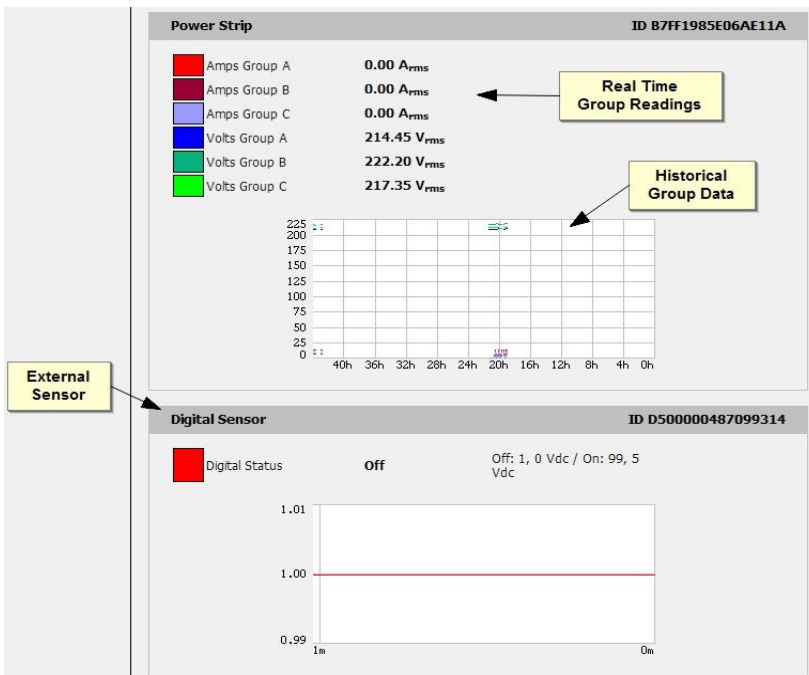


Figure 19: Sensors Page – Group and Sensor Data

Logging Page

The *Logging* page allows the user to access the historical data by selecting the desired sensors and time range to be logged. The Sensor Measurement Data Graph section contains check boxes which allow the user to select which readings are to be graphed on the Logging page and/or displayed on the internal LCD or RSD2X8 remote display module.

The “Logging Control” allows users to select between different modes of logging data.

- **Normal:** Data logged once per minute into data log file.
- **High-water Mark:** High value logged each minute into the data log file.
- **Low-water Mark:** Low value logged each minute into the data log file.
- **Logging Off**

The data will be logged into the data file at a rate of one point per minute and will be available for graphing and display. Please note that although data is logged once per minute, all sensor data used in the real time display and alarm functions is read at least once every 15 seconds for internal sensors and once every 30 seconds for external sensors. Recorded data is available for download in a comma-separated values (CSV) file. To reset the logs click the “Reset Logs” check box and save the changes.

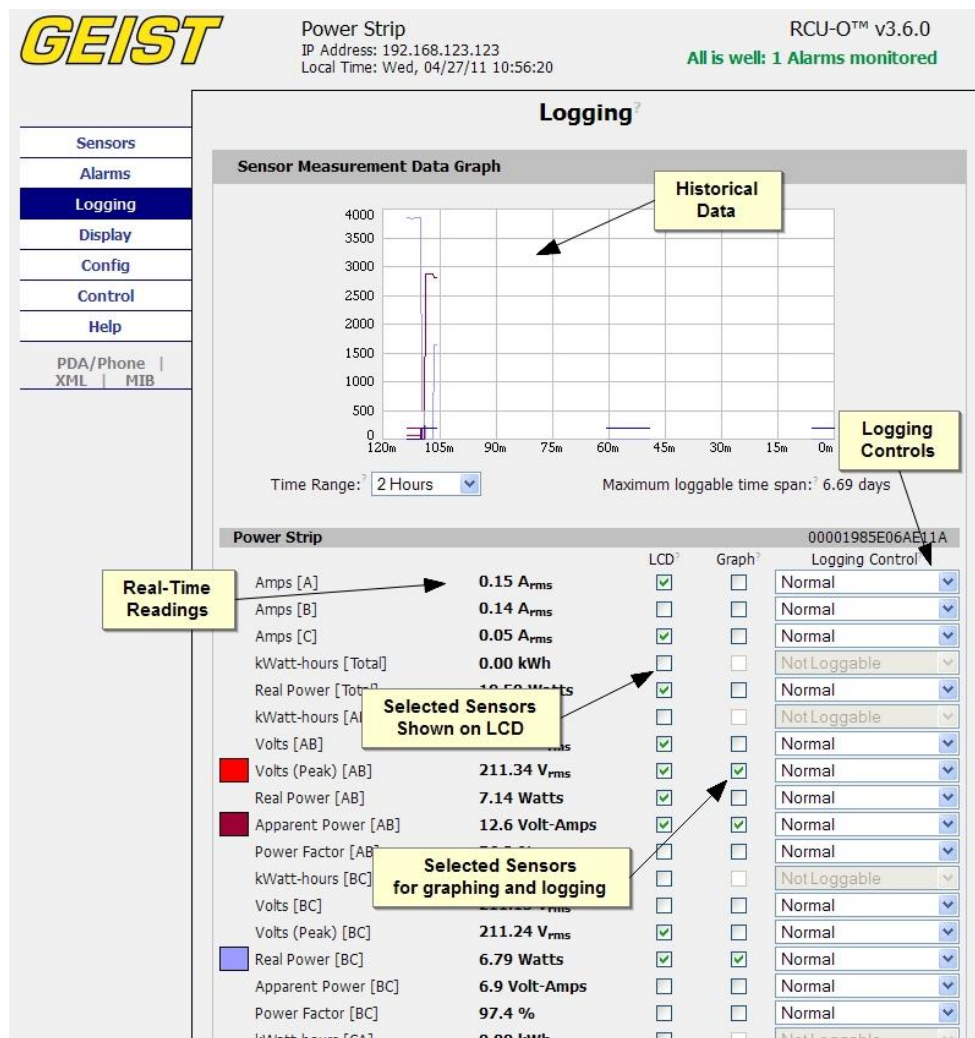


Figure 20: Logging Page

Display Page

The *Display* page allows the user to assign friendly names to attached sensors, change the default unit of measure for all temperature sensors, and change what is scrolling on the LCD display (Measurements or Alarms). The display page also allows the user to select between the default and classic web page layouts. The default interface displays a vertical menu bar to the left of the main window (shown in Figure 19), while the classic interface displays a horizontal menu bar across the top of the screen.

GEIST Power Strip RCU-O™ v3.6.0
IP Address: 192.168.123.123 All is well: 1 Alarms monitored
Local Time: Wed, 04/27/11 10:56:29

Display

General

Default Language: English
Date Format: USA (MM/DD/YY)
Temperature Unit: Fahrenheit
Interface Type: Default
Scroll on LCD: Measurements

Save Changes

Devices

Unique Address	Device Type	Friendly Name
00001985E06AE11A	ctrl3ChDELTA	Power Strip
B7FF1985E06AE11A	ctrlGrpAmps	Power Strip
D500000487099314	digitalSensor	Digital Sensor

Remove all unplugged devices

Save Changes

Setting Friendly Names

Figure 21: Display Page

Alarms Page

The *Alarms* page allows the user to establish alarm conditions for each sensor reading. Alarm conditions can be established with either high or low trip thresholds. The alarms are displayed in different sections based on the device the alarm is associated with. Alarm options include a local Buzzer (with RSD attached), Email and SNMP Trap. See Alarms (page 36) for more details.

GEIST RCM-O Demo (Demo Mode) RCM-O™ v3.6.1
IP Address: 76.79.48.109 All is well: 3 Alarms monitored
Local Time: Wed, 05/11/11 08:28:14

Alarms

RCM-O Demo ID 010EB36A1300000A

Amps [A] trips if Above threshold: 3.0

Alarm must remain tripped for 1 (min) before notification?

Repeat every: No Repeat

E-mail: (E-mail 1) (E-mail 2) (E-mail 3)

Untripped

Save Changes Add New Alarm

Temp Sensor ID 74000001C0E54728

Add New Alarm

External Sensor Alarms

AF/HTD Sensor ID A30000007A345F12

Air Flow trips if Below threshold: 3.0

Alarm must remain tripped for 0 (min) before notification?

Repeat every: No Repeat

E-mail: (E-mail 1) (E-mail 2) (E-mail 3)

Untripped

Save Changes Add New Alarm

Alarm Behavior

Unplugged Alerts: Enabled

Save Changes

Figure 22: Alarms Page

Control Page (RCM-O and RCU-O Only)

The *Control* page has two sub-tabs; *Actions* and *Settings*. See Remote Outlet Switching (page 41) for details.

Control Actions Tab

The *Actions* tab on the *Control* page gives the user control of the outlets. Outlets can be rebooted or turned on/off with or without pre-programmed delays. The status of each outlet is also shown for verification by the user. For RCU-O series units, outlet readings for current, power and logged kilowatt-hours are also shown.

The screenshot displays the GEIST RCU-O Control interface. At the top, it shows 'Power Strip', 'IP Address: 192.168.123.123', 'Local Time: Wed, 04/27/11 10:57:17', and 'RCU-O™ v3.6.0t'. A status message reads 'All is well: 1 Alarms monitored'. The left sidebar contains navigation options: Sensors, Alarms, Logging, Display, Config, Control (selected), Actions, Settings, and Help. Below the sidebar are links for 'PDA/Phone | XML | MIB'. The main content area is titled 'Control' and is divided into two sections: 'RCU-O Control' and 'RCU-O Control' (repeated). Each section contains a table of outlets with columns for Outlet, Name, Status, A_{rms}, kWh, Watts, and URL. Callouts point to 'Outlet Current Readings' (A_{rms}), 'Outlet Power Readings' (Watts), and 'Outlet kWhr Readings' (kWh). At the bottom, there is an 'Action' dropdown menu set to 'None' and an 'Execute' button.


Group A		214.45 V		0.00 A _{rms}			
Outlet	Name	Status	A _{rms}	kWh	Watts	URL	
<input type="checkbox"/>	1	Outlet 1	On	0.00	7.531	0	
<input type="checkbox"/>	2	Outlet 2	On	0.00	0.004	0	
<input type="checkbox"/>	3	Outlet 3	On	0.00	1.715	0	
<input type="checkbox"/>	4	Outlet 4	On	0.00	0.000	0	
<input type="checkbox"/>	5	Outlet 5	On	0.00	5.808	0	
<input type="checkbox"/>	6	Outlet 6	On	0.00	0.571	0	
<input type="checkbox"/>	7	Outlet 7	On	0.00	3.756	0	
<input type="checkbox"/>	8	Outlet 8	On	0.00	0.000	0	

Group B		222.50 V		0.00 A _{rms}			
Outlet	Name	Status	A _{rms}	kWh	Watts	URL	
<input type="checkbox"/>	9	Outlet 9	On	0.00	5.820	0	
<input type="checkbox"/>	10	Outlet 10	On	0.00	0.983	0	
<input type="checkbox"/>	11	Outlet 11	On	0.00	2.534	0	
<input type="checkbox"/>	12	Outlet 12	On	0.00	0.000	0	
<input type="checkbox"/>	13	Outlet 13	On	0.00	0.007	0	
<input type="checkbox"/>	14	Outlet 14	On	0.00	0.182	0	
<input type="checkbox"/>	15	Outlet 15	On	0.00	1.402	0	
<input type="checkbox"/>	16	Outlet 16	On	0.00	0.000	0	

Figure 23: Control Actions Tab

Control Settings Tab

The *Settings* tab on the *Control* page allows the user to name and define a URL for outlets in addition to setting time delays for each outlet action. Boot up status and sequential boot up options are also available. All delay settings are referenced from the trigger event. This tab also allows the user to restore factory default settings for the outlets.



RCU-O (Demo Mode)
IP Address: 76.79.48.110
Local Time: Tue, 05/10/11 09:47:24

RCU-O™ v3.6.1
All is well: 5 Alarms monitored

- Sensors
- Alarms
- Logging
- Display
- Config
- Control
- Actions
- Settings
- Help

PDA/Phone | XML | MIB

Control

RCU-O Configuration

Group A Outlet	Name	URL	Delay (seconds)			Reboot Duration
			Power-On	Power-Off	Reboot	
1	Outlet 1		0	0	0	0
2	Outlet 2		0	0	0	0
3	Outlet 3		0	0	0	0
4	Outlet 4		0	0	0	0
5	Outlet 5		0	0	0	0
6	Outlet 6		0	0	0	0
7	Outlet 7		0	0	0	0
8	Outlet 8		0	0	0	0
9	Outlet 9		0	0	0	0
10	Outlet 10		0	0	0	0
11	Outlet 11		0	0	0	0
12	Outlet 12		0	0	0	0

RCU-O Power On Actions

Outlet	Name	Delay (seconds)	On	Action Off	Last
1	Outlet 1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
2	Outlet 2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
3	Outlet 3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
4	Outlet 4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
5	Outlet 5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
6	Outlet 6	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
7	Outlet 7	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
8	Outlet 8	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9	Outlet 9	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
10	Outlet 10	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
11	Outlet 11	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
12	Outlet 12	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

RCU-O Restore Defaults

Figure 24: Control Settings Tab

Configuration Page

The *Configuration* page has five sub-tabs; *Network*, *Monitoring*, *Diagnostics*, *Event Log*, and *Admin*. See Unit Configuration (page 28) for details.

Configuration Network Tab

The user can enter and update the network settings on the *Network* tab of the *Configuration* page. See Unit Configuration section for details.

GEIST Power Strip RCU-O™ v3.6.0
IP Address: 192.168.123.123
Local Time: Wed, 04/27/11 10:56:41
All is well: 1 Alarms monitored

Configuration

Network

Current Network Configuration set statically

- Use **DHCP** for Network Configuration and DNS Server Addresses
- Use **DHCP** for Network Configuration and **Static** DNS server addresses:
- Use **Static** Network Configuration and DNS server addresses:

IP Address: 192.168.123.123
Subnet Mask: 255.255.255.0
Gateway: 192.168.123.1
Primary DNS Server: 8.8.8.8
Secondary DNS Server: 8.8.4.4

Save Changes

Web Server

Protocols: HTTP and HTTPS
HTTP Port: 80
HTTPS Port: 443
Telnet Service: Enabled

Save Changes

Network Settings

Figure 25: Configuration Network Tab

Configuration Monitoring Tab

The user can enter and update the email alert, SNMP, and camera settings on the *Monitoring* tab of the *Configuration* page. See Unit Configuration section for details.

The screenshot displays the 'Configuration' page for a GEIST device. The interface includes a top status bar with 'Power Strip' information, IP address (192.168.123.123), local time (Wed, 04/27/11 14:08:04), and 'RCU-O™ v3.6.0' with 'All is well: 0 Alarms monitored'. A left sidebar contains navigation links: Sensors, Alarms, Logging, Display, Config (selected), Network, Monitoring (selected), Diagnostics, Event Log, Admin, Control, and Help. Below the sidebar are links for 'PDA/Phone' and 'XML'. The main content area is titled 'Configuration' and is divided into several sections:

- E-mail:** Includes fields for Protocol (ESMTP/TLS/SSL), SMTP Server, SMTP Port (25), 'From' E-mail Address, Username, and Password. It also features a table for 'Send alerts to this recipient' with columns for 'Always', 'Business Hours', 'After Hours', and 'SMS', and five rows for 'To E-mail Address 1' through '5'. 'Save Changes' and 'Send Test E-Mail' buttons are present.
- Business Hours:** Includes 'Start Time' (09:00) and 'End Time' (17:00) fields, a 'Week days' selection (Sun-Fri), and a 'Save Changes' button.
- System Status E-Mail Reports:** Includes an 'Add New Report' button.
- SNMP:** Includes fields for 'SNMP Service' (Enabled), 'Temperature Precision' (1x degree C/F), 'Read Community' (public), 'Listen port for GET' (161), 'Trap Community' (private), 'Write Community' (private), 'Trap Type' (V1 Trap), and two 'Trap IP Address:port' fields (192.168.123.1:162 and 192.168.123.1). 'Save Changes' and 'Send Test SNMP Trap' buttons are included.
- Initial SNMPv3 data:** Includes fields for 'Unauthenticated User' (initial), 'Authenticated Manager' (manager), 'Manager Authentication Password' (12345678), 'Manager Privacy Password' (12345678), 'Trap User' (Trap), 'Trap Authentication Password' (12345678), and 'Trap Privacy Password' (12345678). A 'Save Changes' button and a note 'Reset User/Access NVRAM will occur during the finish page.' are also present.
- Cameras:** Includes four camera configuration blocks (Cam 1-4), each with 'IP Address' (0.0.0.0), 'Model' (No camera), 'Username', and 'Password' fields. A 'Save Changes' button is at the bottom.

Figure 26: Configuration Monitoring Tab

Configuration Diagnostics Tab

The user can update the Syslog settings on the *Diagnostics* tab of the *Configuration* page.

GEIST Power Strip RCU-O™ v3.6.0
 IP Address: 192.168.123.123
 Local Time: Wed, 04/27/11 10:56:54
 All is well: 1 Alarms monitored

Configuration

Syslog

Facility: LOCAL0

Daemon Address:port 1: 192.168.123.1:514
 192.168.123.1

Save Changes

Syslog Configuration

Subsystems	Severity							
	emergency	alert	critical	error	warning	notice	inform	debug
os	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lwip	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
socket	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
macphy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
flashfl	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
webserv	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
spi0dev	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
device	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
host	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
setvars	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dynweb	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
snmp	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
alarms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
email	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
rtclock	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sntp	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dns	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
datalog	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
graphin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
firmwar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
msgcatlg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Save Changes

Figure 27: Configuration Diagnostics Tab

Configuration Event Log Tab

The user can view the Event Log and update the Memory Syslog settings on the *Event Log* tab of the *Configuration* page.

GEIST Power Strip RCU-O™ v3.6.0
 IP Address: 192.168.123.123 All is well: 1 Alarms monitored
 Local Time: Wed, 04/27/11 10:56:59

Configuration

NVRAM Event Log
[Click here to view NVM event log](#)

Memory Syslog

```

4/27/2011 15:48:57 setvars:var_init: Reading data from flash succeeded. Me
4/27/2011 15:48:57 lwip :udp_input:udp (192.168.123.255, 137) <-- (192.
4/27/2011 15:48:57 lwip :udp_input:received datagram of length 68
4/27/2011 15:48:57 lwip :ip_input:iphdr->dest 0xff7ba8c0 netif->ip_addr
4/27/2011 15:48:57 setvars:var_init: size of block in flash: 20520, Curren
4/27/2011 15:48:57 setvars:var_init: Current firmware rev [943], data in f
4/27/2011 15:48:57 setvars:var_init: token_read=[VARS BLOCK HERE], from ad
4/27/2011 15:48:57 setvars:var_netstack_push: secondary dns address set to
4/27/2011 15:48:57 setvars:var_netstack_push: primary dns address set to s
4/27/2011 15:48:57 setvars:var_netstack_push: gateway set to 192.168.123.1
4/27/2011 15:48:57 setvars:var_netstack_push: netmask set to 255.255.255.0
4/27/2011 15:48:57 setvars:var_netstack_push: IP address set to 192.168.12
4/27/2011 15:48:57 socket :set static IP to 192.168.123.123
4/27/2011 15:48:57 setvars:var_netstack_push: DHCP status set to 0.
4/27/2011 15:48:57 setvars:var_netstack_push: MAC address was set to 00:19
4/27/2011 15:48:57 setvars:var_netstack_push: secondary dns address set to
4/27/2011 15:48:57 setvars:var_netstack_push: primary dns address set to s
4/27/2011 15:48:57 setvars:var_netstack_push: gateway set to 0.0.0.0.
4/27/2011 15:48:57 setvars:var_netstack_push: netmask set to 0.0.0.0.
4/27/2011 15:48:57 setvars:var_netstack_push: IP address set to 0.0.0.0.
  
```

Memory Syslog

Subsystems	Severity							
	emergency	alert	critical	error	warning	notice	inform	debug
os	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lwip	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
socket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
macphy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
flashfl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
webserv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
spi0dev	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
host	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
setvars	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dynweb	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
snmp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
alarms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
email	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
rtclock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sntp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
datalog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
graphin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
firmwar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
msgcatlg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E-mail Send logs now

Figure 28: Configuration Event Log Tab

Configuration Admin Tab

The user can set the system clock and administrative information on this tab. Additionally, the user can set administrator and account passwords. See Unit Configuration section for details.

The screenshot displays the Configuration Admin Tab interface for a GEIST Power Strip. The top header includes the GEIST logo, system information (Power Strip, IP Address: 192.168.123.123, Local Time: Wed, 04/27/11 10:57:05), and version (RCU-O™ v3.6.0#). A status bar indicates "All is well: 1 Alarms monitored".

The interface is organized into several sections:

- All Parameters:** Includes buttons for "Reset ALL to Default Values" and "Refresh DNS Cache".
- RCU-O Reset kWh:** Includes buttons for "Reset Circuit A", "Reset Circuit B", "Reset Circuit C", and "Reset all circuits".
- System Clock, set to GMT:** Features a "Set Clock method" dropdown set to "Manual - GMT". Below are input fields for "GMT to local, (+/-)hh:mm" (-05:00) and a date/time picker (Month: 04, Day: 27, Year: 11, Hour: 15, Minute: 57, Second: 05). A "Save Changes" button is present.
- Daylight Saving Time:** Shows "DST is DISABLED" and an "Enable DST:" dropdown set to "Disabled". A "Save Changes" button is present.
- Name and Password Configuration:** Contains three password change sections for "Administrator Account Name" (admin), "Control Account Name" (control), and "View Only Account Name" (view). Each section includes fields for "Old Password", "New Password", and "New Password Again", with a warning: "Warning: Record your password. Loss of password may require 48 hours to recover." A "Save Changes" button is at the bottom.
- Admin Info:** Includes text input fields for "Contact Name:", "Contact Email:" (with a "(sysContact)" label), "Contact Phone:", "Device Location:" (with a "(sysLocation)" label), and "Device Description:" (with a "(system)" label). A "Save Changes" button is present.
- Saved Configuration XML File:** Features an "XML File:" input field with a "Browse..." button, an "Upload Local XML File" button, and a "Download Current XML File" link.
- SSL Certificate and Private Key:** Shows a red warning: "SSL Certificate and Private Key are **INVALID**". It includes "SSL Certificate File:" and "SSL Private Key File:" input fields with "Browse..." buttons, an "Upload SSL Files" button, and an "Erase SSL Data" button.
- Upload System Firmware:** Includes a "Firmware package file:" input field with a "Browse..." button and an "Upload New Firmware" button. A note states: "Firmware upload may take a few minutes. Please wait for response from browser."

Figure 29: Configuration Admin Tab

Unit Configuration

Network Configuration

The unit's network configuration is set on the *Network* tab of the *Configuration* page. Settings pertaining to the unit's network connection are:

The screenshot displays the 'Network' configuration page. At the top, it indicates 'Current Network Configuration set statically'. Three radio buttons are present: 'Use DHCP for Network Configuration and DNS Server Addresses' (unselected), 'Use DHCP for Network Configuration and Static DNS server addresses:' (unselected), and 'Use Static Network Configuration and DNS server addresses:' (selected). Below these are input fields for IP Address (76.79.48.112), Subnet Mask (255.255.255.224), Gateway (76.79.48.97), Primary DNS Server (208.67.222.222), and Secondary DNS Server (208.67.222.220). A 'Save Changes' button is located at the bottom of the network section.

The 'Web Server' section below contains a dropdown for 'Protocols' set to 'HTTP and HTTPS', input fields for 'HTTP Port' (80) and 'HTTPS Port' (443), and a dropdown for 'Telnet Service' set to 'Enabled'. A 'Save Changes' button is also present at the bottom of this section.

At the very bottom of the page, there are language options: 'English | Español'.

Figure 30: Network Configuration

- **DHCP:** Allows the unit to request a dynamic IP address from a server on the network.
- **Static IP Address/Net Mask/Gateway:** When not using a dynamic address, enter static network configuration information here.

Telnet Service: Enable or disable the built-in Telnet server. See

- Telnet (page 33) for details.
- **HTTP Services:** Enables/disables access via HTTP and HTTPS. Available options are: HTTP and HTTPS, HTTP only, and HTTPS only. It is not possible to disable the web interface completely.
- **HTTP/HTTPS Server Port:** Changes the TCP port that each server listens on.
- **DNS Servers:** Allows the unit to resolve host names for Email, NTP and SNMP servers as well as cameras.

Time and Date

The system clock is set on the *Admin* tab of the *Configuration* page. The unit comes preconfigured with the IP addresses of two NIST time servers and is set to the Central Time Zone (-0500 GMT). Should a local time server be preferred, select "NTP Server" from the "Set Clock method" drop-down menu, enter its IP address into the "NTP primary server" box and click "Save Changes". Clearing the time server addresses and clicking "Save Changes" will set the time servers back to the defaults. The unit attempts to contact the time servers during boot up and periodically while running. Until a time server is contacted or the system clock is manually set, all log time stamps will present time as the number of seconds since the unit was powered up and graphs will not be shown.

The clock can also be setup to automatically change for Daylight Savings Time when needed. When enabled, the user can select the dates and times for the clocks to adjust.

Note: Enabling automatic DST or setting the time zone offset forward and backward will cause a gap or overwriting of logs.

The screenshot shows two configuration sections. The first section, titled "System Clock, set to GMT", has a "Set Clock method" dropdown set to "Manual - GMT". Below it, "GMT to local, (+/-)hh:mm" is set to "-05:00". There are input fields for "Month" (05), "Day" (05), "Year" (11), "Hour" (14), "Minute" (48), and "Second" (01). A "Save Changes" button is at the bottom. The second section, titled "Daylight Saving Time", shows "Operating in: Daylight Saving Time". "Enable DST" is set to "Enabled". "DST Start" is set to "2nd Sun in Mar at 00:00" and "DST End" is set to "1st Sun in Dec at 00:00". A "Save Changes" button is at the bottom.

Figure 31: Manual Time Settings

The screenshot shows the "System Clock, set to GMT" configuration section. "Set Clock method" is set to "NTP Server". "GMT to local, (+/-)hh:mm" is set to "-05:00". There are two input fields for "NTP primary server" with the value "192.43.244.18" and two for "NTP secondary server" with the value "129.6.15.28". "Sync to NTP server period (seconds)" is set to "1800". A "Save Changes" button is at the bottom.

Figure 32: NTP Time Settings

The time, date, IP address and friendly name of the unit are displayed at the top of each web page.

```

RCU-0
IP Address: 192.168.120.42
Local Time: Thu, 05/07/09 15:46:46
  
```

Figure 33: Time and Date Display

E-Mail/ Business Hours

The e-mail and business hours configuration are set on the *Monitoring* tab of the *Configuration* page. The unit is capable of sending e-mail to as many as five addresses at once. Most SMTP and ESMTP servers are compatible. Authentication options are None, POP3 (POP-before-SMTP) or ESMTP. The unit can be configured to send alarm emails always, only during business hours or only after hours by selecting the desired option next to each email address.

E-mail

Protocols:

SMTP Server:

SMTP Port:

"From" E-mail Address:

Username:

Password:

Send alarms to this recipient:	Always	Business Hours [?]	After Hours [?]	SMS [?]
To E-mail Address 1: <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
To E-mail Address 2: <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
To E-mail Address 3: <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
To E-mail Address 4: <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
To E-mail Address 5: <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>

Business Hours

Start Time:

End Time:

Sun Mon Tue Wed Thu Fri Sat

Week Days:

Figure 34: E-Mail Configuration

An SMTP server as well as “From” and “To” addresses are required to send e-mails. Some mail servers may require a username and password. In most cases, the username does not have to match the “From” address, but does need to be a valid user on the authenticating server. Microsoft Exchange servers will have to be set to allow SMTP relay from the IP address of the unit. In addition, a test email can be sent from the bottom of the *Monitoring* tab of the *Configuration* page.

Note: The unit cannot receive e-mails. The POP3 server is used strictly for authentication and is not required when the protocol is set to ESMTP or None.

Status Reports

When enabled, the unit will periodically send a full status report to all “To” e-mail addresses selected for the report. The report includes current unit data from all attached sensors as well as alarm states. Reporting frequency options are: weekly, hourly, every 2, 3, 4, 6, 8, 12, 24, or 48 hours. E-mail addresses are selected when the report is created by checking the corresponding e-mail destination box. Allowing the cursor to hover over an e-mail destination box will display the e-mail address that the box is associated with.

The screenshot shows the 'System Status E-Mail Reports' configuration interface. It includes input fields for 'Report Time' with sub-fields for 'hour' (00) and 'min' (00), and a 'Report Period' dropdown menu set to '24 hours'. Below these are five checkboxes for 'E-mail Destinations' and a 'Delete This Report' checkbox. At the bottom are two buttons: 'Save Changes' and 'Add New Report'.

Figure 35: Email Report Settings

SNMP

The unit supports retrieval of all data via Simple Network Management Protocol (SNMP) v1, v2c, and v3. In addition, alarm traps can be sent to up to two IP addresses. The SNMP configuration is entered on the *Monitoring* tab of the *Configuration* page.

The screenshot displays the 'SNMP' configuration page. It features a 'SNMP Service' dropdown set to 'Enabled', a 'Temperature Precision' dropdown set to '1x degree C/F', and text input fields for 'Read Community' (public), 'Listen port for GET' (161), 'Trap Community' (private), and 'Write Community' (private). A 'Trap Type' dropdown is set to 'V1 Trap'. There are two 'Trap IP Address:port' fields, with the first containing '192.168.123.1:162' and '192.168.123.1'. At the bottom are 'Save Changes' and 'Send Test SNMP Trap' buttons.

Figure 36: SNMP Configuration

The screenshot shows the 'Initial SNMPV3 data' configuration page. It contains several text input fields: 'Unauthenticated User' (initial), 'Authenticated Manager' (manager), 'Manager Authentication Password' (12345678), 'Manager Privacy Password' (12345678), 'Trap User' (Trap), 'Trap Authentication Password' (12345678), and 'Trap Privacy Password' (12345678). A 'Save Changes' button is at the bottom, along with a note: 'Reset User/Access NVRAM will occur during the finish page.'

Figure 37: Initial SNMP V3 Data

The default community string is “public” and the MIB is downloadable via a link on the web pages menu bar.

Accounts and Passwords

The RCX, RCU-O and RCM-O offer account security options that are entered on the *Admin* tab of the *Configuration* page. There are three levels of account security:

- **Administrator:** Password protects the Display, Alarms and Configuration pages along with protecting the Telnet and Serial access.
- **Control Access:** Password protects the Control Actions and Control Settings pages.
- **View-Only:** Password protects the Sensors, PDA, WAP and XML pages.

Name and Password Configuration

NOTE 1: If Account currently has a password, leaving Old Password blank results in no changes to that account.
NOTE 2: Administrator password may be used in the Old Password field of any account.
NOTE 3: If setting New Password to blank, Account Name must also be blank.
NOTE 4: If New Password is not blank, Account Name must not be blank.

Administrator Account Name

If blank, all access is granted without a password.

Old Password

New Password

New Password Again (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.

Control Account Name

If blank, Control and View Only access is granted without a password.

Old Password

New Password

New Password Again (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.

View Only Account Name

If blank, View access is granted without a password.

Old Password

New Password

New Password Again (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.

Figure 38: Account Configuration

User account names may include alphanumeric characters, spaces and underscores. Passwords may include alphanumeric characters and underscores.

Note: The Administrator account must be active to enable the Control Access and View-Only accounts.

Note: The Control Access account must be active to enable the View-Only account.

Note: The account names "root" and "admin" are disabled for security reasons and cannot be re-enabled.

Warning: Record your passwords. To reset lost passwords, follow the instructions for resetting the unit's IP address and passwords given in the Default IP Address section. To generate a temporary recovery password to access the unit, contact customer service from a location where the unit can be accessed via the internet.

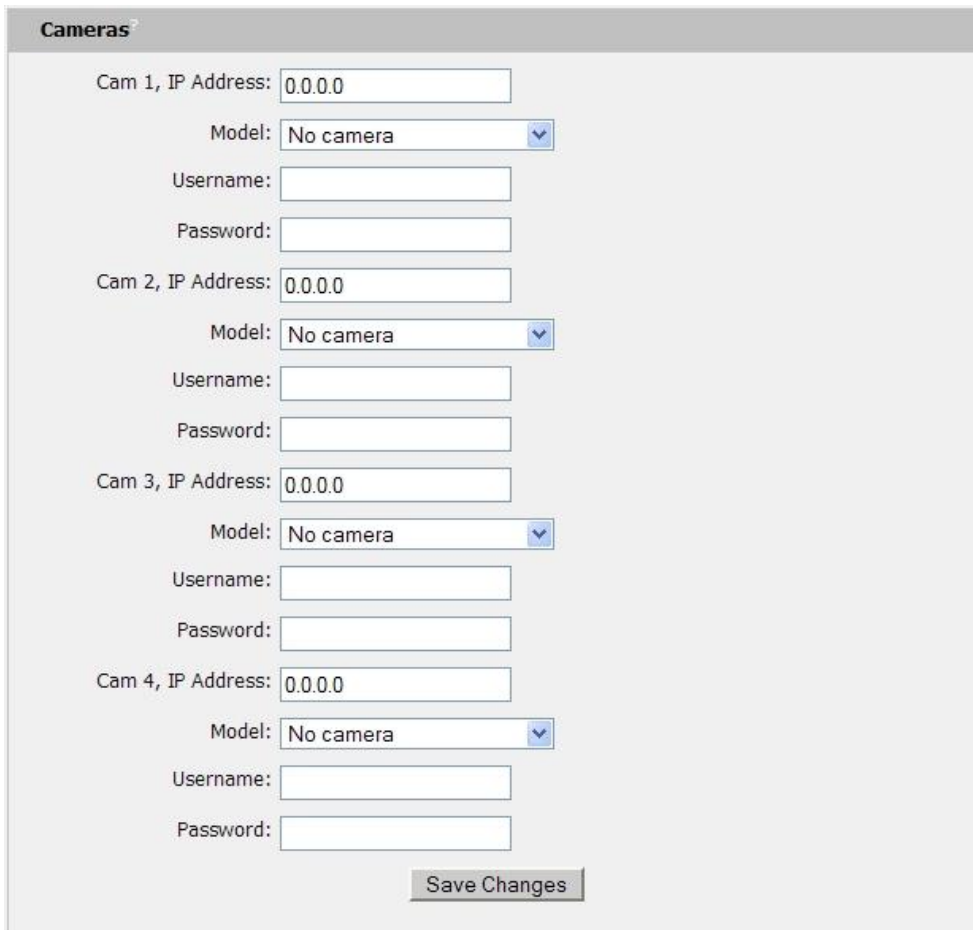
Telnet

The unit provides a Telnet server for basic monitoring via the command line. The Administrator account must be enabled to use the Telnet interface. Type “help” after logging in to the unit to see a list of available commands. The Telnet service can be disabled under “Web Server” on the *Network* tab of the *Configuration* page.

Note: All data sent via Telnet is unencrypted. Some settings can be changed and user names and network settings are available via Telnet. In unsecure environments, it is recommended that Telnet be disabled.

Camera Configuration

Enter the domain names/IP addresses and models of up to four IP-addressable network cameras in the “Cameras” section of the *Monitoring* tab on the *Configuration* page. The unit will present a linked snapshot from each camera on the *Sensors* page.



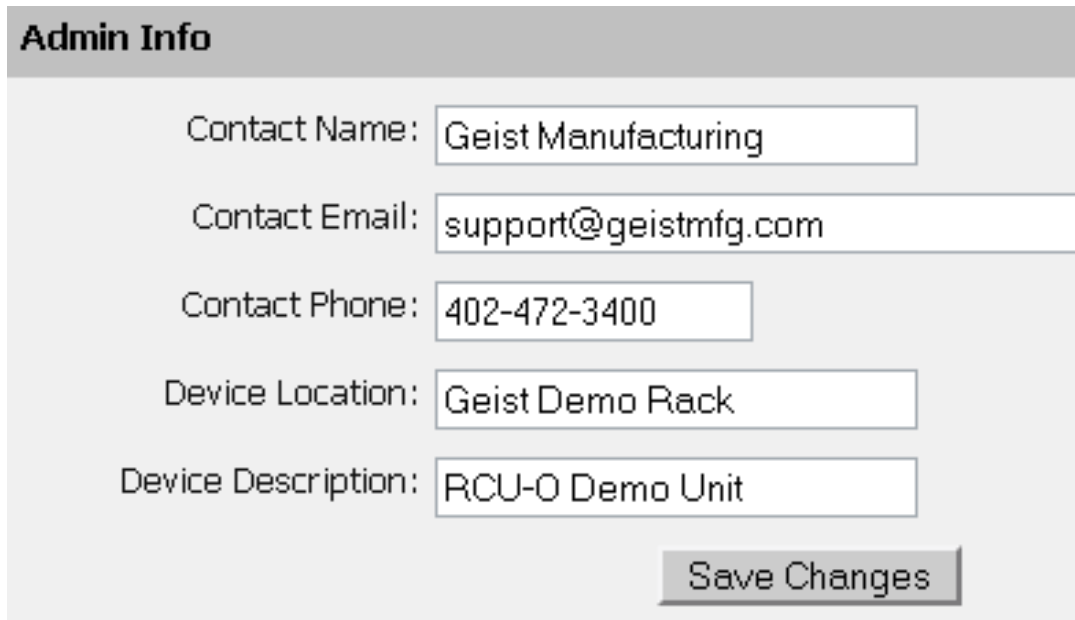
The screenshot shows a web interface titled "Cameras" with a light gray background. It contains four identical camera configuration sections, labeled "Cam 1" through "Cam 4". Each section has the following fields: "IP Address" (text input with "0.0.0.0"), "Model" (dropdown menu with "No camera" selected), "Username" (text input), and "Password" (text input). At the bottom center of the form is a "Save Changes" button.

Figure 39: Configuration and Supported Models

Note: Each camera must be set to allow anonymous access to enable this feature.

Admin Information

Information entered in the "Admin Info" section of the *Admin* tab of the *Configuration* page will show up at the bottom of the unit's web interface.



Admin Info

Contact Name:

Contact Email:

Contact Phone:

Device Location:

Device Description:

Figure 40: Admin Information Fields

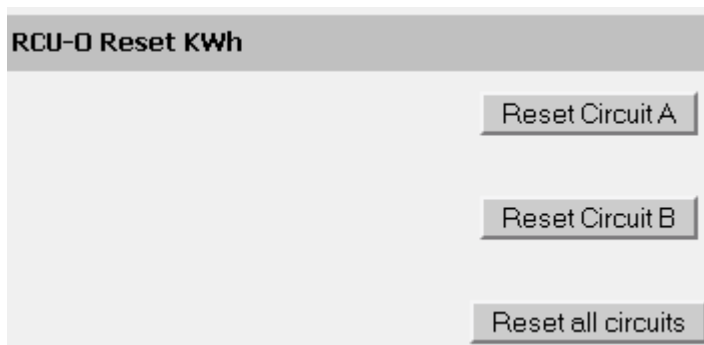


Unit Location: Geist Demo Rack
Unit Description: RCU-O Demo Unit
Admin: [Geist Manufacturing](#) or Call 402-472-3400
Support: support@geistmfg.com or Call 800.432.3219
Copyright © 2003-2009 [Geist Manufacturing](#) All Rights Reserved.

Figure 41: Admin Information Display

Kilowatt-Hours Reset

The RCX, RCU-O and RCM-O's kilowatt-hours measurements are zeroed at the factory and can be reset at any time, should it become necessary. On the *Admin* tab of the *Configuration* page, simply hit the button that corresponds to the desired circuit to be reset.



RCU-O Reset KWh

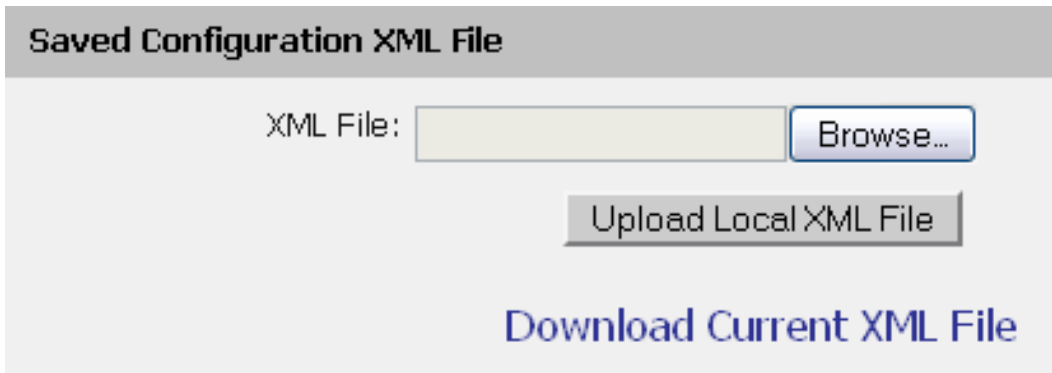
Figure 42: Kilowatt Hours Reset

XML File Backup

The RCX, RCU-O or RCM-O unit's configuration is stored in the XML file. The XML file can be downloaded and stored in order to backup the unit's current configuration settings. On the *Admin* tab of the *Configuration* page, simply hit the Download Current XML File button to download the XML file.

A previously downloaded XML file can be uploaded to the unit in order to restore the unit's configuration to match the configuration contained in the XML file. On the *Admin* tab of the *Configuration* page, click the Upload Local XML file button to upload a local XML file.

Note: XML files are unit specific, and should only be uploaded to the unit that it was downloaded from.



The screenshot shows a web interface titled "Saved Configuration XML File". It features a text input field labeled "XML File:" with a "Browse..." button to its right. Below this is a button labeled "Upload Local XML File". At the bottom of the interface is a large blue button labeled "Download Current XML File".

Figure 43: XML File Upload

SSL Certificate Upload

The unit will automatically generate a unique SSL Certificate and Private Key. Alternatively, a custom SSL Certificate and Private Key can be uploaded to the unit by pressing the "Upload SSL Files" button on the *Admin* tab of the *Configuration* page. The SSL certificate and key file must be in Distinguished Encoding Rules (DER) format. The SSL Certificate and Private Key can be cleared by clicking the "Erase SSL Data" button on the *Admin* tab of the *Configuration* page.



The screenshot shows a web interface titled "SSL Certificate and Private Key". At the top, it displays the message "SSL Certificate and Private Key are **INVALID**". Below this, there are two text input fields: "SSL Certificate File:" and "SSL Private Key File:", each with a "Browse..." button to its right. At the bottom of the interface are two buttons: "Upload SSL Files" and "Erase SSL Data".

Figure 44: SSL Certificate and Private Key Upload

Alarms

Alarm Notifications

The RCX, RCU-O and RCM-O support three types of alarm notification:

- **E-Mail:** The unit can be configured to send alarm e-mails to up to five recipients.
- **SNMP:** The unit can be configured to send SNMP traps to up to two trap servers.
- **Buzzer:** When a remote display (RSD2X8) is attached, the unit can turn on an audible alarm.

The unit is capable of any combination of the above alarms at once. Alarm type combinations are selected per alarm via the check boxes which are displayed for each alarm on the Alarms page.

The screenshot displays the 'Alarm State Menu' for an RCM-O Demo unit (ID 010EB36A1300000A). It features three main configuration sections: 1) Sensor and Trip Settings: 'Amps [A]' is selected, with 'trips if' set to 'Above' and a 'threshold' of '3.0'. 2) Timing and Repeat Settings: 'Alarm must remain tripped for' is set to '1 (min) before notification' and 'Repeat every' is set to 'No Repeat'. 3) Notification Settings: Under 'E-mail', three checkboxes are shown: '(E-mail 1)' is checked, '(E-mail 2)' is unchecked, and '(E-mail 3)' is unchecked. A green 'Untripped' button is located at the bottom right of the interface.

Figure 45: Alarm State Menu

Alarm Types

The RCX, RCU-O and RCM-O provide three types of alarm messages via E-Mail and SNMP:

- **Trip:** Occurs when a sensor value goes above a high trip threshold or below a low trip threshold.
- **Unplugged:** Occurs when a sensor with an alarm set loses contact with the main unit due to the sensor being physically unplugged or another communications error. Unplugged alerts can be enabled or disabled on the *Alarms* page.
- **Clear:** Occurs when a sensor already in the Tripped or Unplugged state goes back into its normal range.

Alarms can be added for each internal device or external sensor displayed on the *Alarms* page. An alarm is added by pressing the "Add New Alarm Button" and selecting the sensor value to be monitored from the drop down menu.

Thresholds

The user must set a trip threshold and type for each alarm that is added to the *Alarms* page. The threshold type is chosen as either "Below" or "Above" from a drop down menu when the alarm is created. The threshold value is typed into a data window when the alarm is created. Alarms are triggered based on the selected sensor's data and the trip threshold type and value. Alarm settings can be edited or deleted at any time.

Analysis of each unit is recommended before setting alarm thresholds as some of the values monitored by the unit are relative values, whose scale will differ slightly between units. Allow each unit to operate under normal, steady state conditions for several hours before setting alarm thresholds. By allowing the sensors to operate for several hours, the user can better understand what the normal variations are; thereby allowing the user to choose alarm thresholds that will not trigger numerous false alarms.

Alarms can be set to only send notification if the alarm is in a tripped state for a certain amount of time. The user sets the amount of time required by entering a value from 0-240 minutes in the text box on the *Alarms* page. Additionally, alarm notifications can be set to send multiple notifications for an alarm that remains in a tripped state. The alarm notifications are set to repeat at intervals of no repeat, 10, 30, or 60 minutes by selecting the desired option in the drop down menu on the *Alarms* page.

Note: Changes in settings take a few moments to become active. Rapidly resetting alarm values may not provide the desired results. Allow up to 2 minutes after changing a setting before modifying it again.

Sensors

Overview

All internal sensors are measured every 15 seconds. External sensors are measured every 15 to 30 seconds, depending on the number of devices connected. Sensor data collected by the RCX, RCM-O or RCU-O unit gives useful trend analysis data. While all values are not absolute in relation to a known unit, trend analysis of the data allows users to view changes and draw useful conclusions about what is happening over time in the monitored environment.

Note: DM series units are connected as sensors and collect a large amount of data. These will take longer than the usual 15 to 30 second for the RCX, RCM-O or RCU-O units to measure.

Internal Sensors

The RCX, RCU-O and RCM-O units contain internal sensors that are configured in two different ways:

Wye Configuration

- **Total Unit**
 - Kilowatt-Hours: Cumulative sum of Real Power for all lines.
 - Real Power: Total average of instantaneous voltage and current on all lines over last 1.5 seconds.
- **Line Level (A, B, C):**
 - Kilowatt-Hours: Cumulative sum of Real Power.
 - Volts: Measures instantaneous RMS voltage.
 - Volts (Peak): Reports the highest reported voltage since the last time the data was updated, typically every 15 seconds.
 - Real Power: Average of instantaneous voltage and current over last 1.5 seconds.
 - Apparent Power: The product of instantaneous RMS Voltage and RMS Current.
 - Power Factor: The ratio of Real Power to Apparent Power.
 - Amps: Measures instantaneous RMS current.
 - Amps (Peak): Reports the highest reported current since the last time the data on the screen

Delta Configuration

- **Total Unit**
 - Kilowatt-Hours: Cumulative sum of Real Power for all lines.
 - Real Power: Total average of instantaneous voltage and current on all lines over last 1.5 seconds.
- **Phase Level (AB, BC, CA):**
 - Kilowatt-Hours: Cumulative sum of Real Power.
 - Volts: Measures instantaneous RMS voltage.
 - Volts (Peak): Reports the highest reported voltage since the last time the data was updated, typically every 15 seconds.
 - Real Power: Average of instantaneous voltage and current over last 1.5 seconds.
 - Apparent Power: The product of instantaneous RMS Voltage and RMS Current.
 - Power Factor: The ratio of Real Power to Apparent Power.
- **Line Level (A, B, C):**
 - Amps: Measures instantaneous RMS current.

The RCU-O contains the following additional onboard sensors:

- **Group Volts:** Measures instantaneous RMS voltage for a group of outlets.
- **Group Amps:** Measures instantaneous RMS current for a group of outlets.
- **Outlet Amps:** Measures instantaneous RMS current for each outlet.
- **Outlet Real Power:** Average of instantaneous voltage and current over last 1.5 seconds for each outlet.
- **Outlet Kilowatt-Hours:** Cumulative sum of Real Power for each outlet.

Remote Sensors

Available Sensors:

- **RT:** Temperature
- **RTAFHD3:** Temperature / Air Flow / Humidity / Dew Point
- **CCAT:** Converts analog I/O Sensors to Remote Digital Sensors
- **IOE:** Expands the number of I/O and sensor ports and adds relays
- **DM:** Remote digital RMS current Meter
- **RS2:** Remote power monitoring and switching

*RTAF, RTAFH & RTHD sensors have been discontinued and replaced by the RTAFHD3 sensor. Some Geist R-Series devices may require a firmware update to allow for proper compatibility with the new RTAFHD3 sensors.

If your Geist R-Series device is using firmware version 2.xx you will want to make sure you are using firmware version 2.94 or newer.

If your Geist R-Series device is using firmware version 3.xx you will want to make sure you are using firmware version 3.5.0 or newer.

Please contact Geist Support at 800-432-3219 if you need assistance locating your current version or upgrading to the new firmware version

RTAFHD3 Compatibility

The (G)RTAFHD3 sensor cannot be utilized in combination with the discontinued (G)RTAF and (G)RTAFH sensors or (G)RTHD sensors built prior to 2010. If you desire to add (G)RTAFHD3 sensors to an existing installation currently utilizing incompatible sensors, please contact Customer Service for installation options.

Connecting Remote Sensors

Plug-and-play remote sensors may be attached to the unit at any time via the RJ-12 connectors on the face of the unit. In some cases splitters may be required to add additional sensors. Each sensor has a unique serial number and is automatically discovered and added to the web page. Up to sixteen sensors may be connected (15 on RCU-O).

The display order of the sensors on the web page is determined by the serial number of each sensor. Friendly names for each sensor can be customized on the *Display* page.

Note: The sensors use Cat. 3 wire and RJ12 connectors. Wiring must be straight-through: reverse polarity will temporarily disable all sensors until corrected.

Note: The sensors use a low voltage serial communication protocol and are subject to network signaling constraints dependent on shielding, environmental noise, and length of wire. Typical installations allow runs of up to 600 feet of sensor wire.

Data Logging and Display

All sensor data collected by the unit can be graphed, except kilowatt-hours and outlet level data (RCU-O only). The *Logging* page allows the user to select data to be logged. The user can also choose to view a graph of any logged data. Selected sensor values are logged into the data file at a rate of one point per minute. The number of selected sensors determines the maximum data logging time span. This period is calculated and displayed on the *Logging* page. The oldest data will be deleted when the onboard memory fills up in order to make room for new data. Sensor values can also be selected for display on the local LCD or Remote Display (RSD2X8).

Remote Outlet Switching (RCM-O and RCU-O Only)

Actions

The RCM-O and RCU-O Series are equipped with individually switchable outlets. There are seven possible actions for any given outlet, available from the “Action” drop down box on the *Actions* tab of the *Control* page:

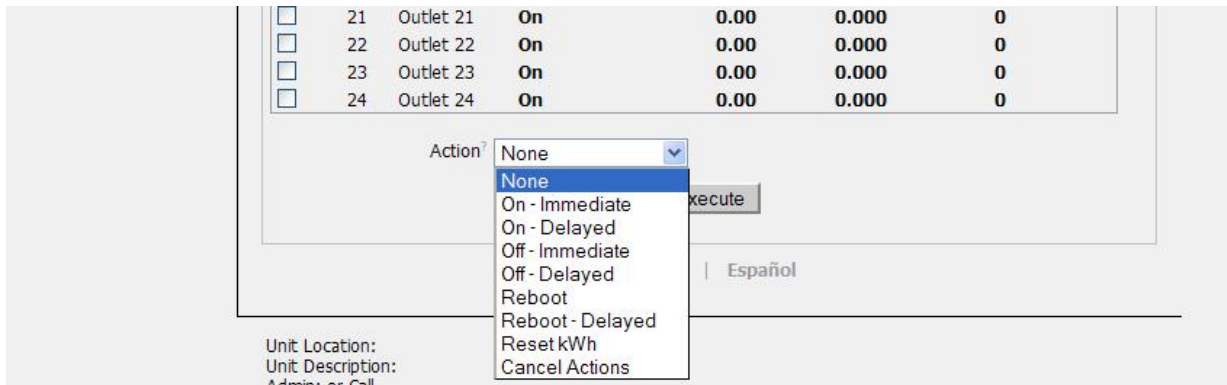


Figure 46: Outlet Actions

- **On – Immediate:** Turns on all selected outlets with no delay.
- **On – Delayed:** Turns on all selected outlets with applicable delays.
- **Off – Immediate:** Turns off all selected outlets with no delay.
- **Off – Delayed:** Turns off all selected outlets with applicable delays.
- **Reboot:** Cycles power to the selected outlets with one applicable delay. Each outlet is powered-down immediately, then “Reboot Duration” sets the delay after power-down and before power-up.
- **Reboot-Delayed:** Cycles power to the selected outlets with two applicable delays. “Reboot” delays before power down, and “Reboot Duration” sets the delay after power-down and before power-up.
- **Reset kWh:** Resets the kWh total on all selected outlets to 0. (RCU-O only)
- **Cancel Actions:** Cancels any actions currently in progress on the selected outlets.

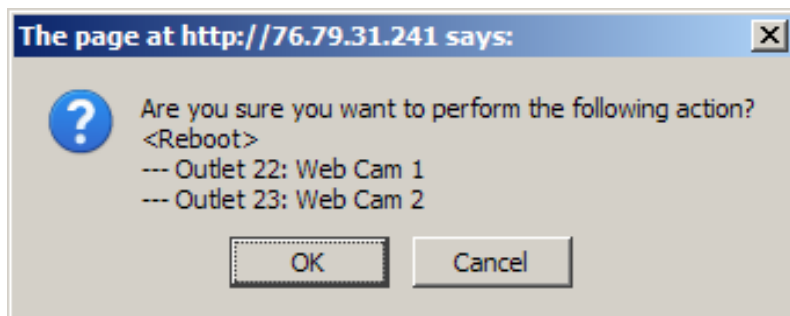


Figure 47: Outlet Action Confirmation

To perform an action, select the check box next to the outlets needing attention, select an action from the drop down box and click the “Execute” button. A dialog box will appear asking for confirmation of the selected actions. Click OK to execute the action. Click cancel to make changes or ignore the action.

Note: “Reboot”, “Reboot-Delayed” and “On/Off-Delayed” actions are subject to the delays set on the *Settings* Tab of the *Control* page.

Configuration

The RCM-O and RCU-O series units list all available outlets under “Configuration” on the *Settings* tab of the *Control* page. Each outlet has five fields associated with it:

RCU-O Configuration						
Group A			Delay (seconds)			Reboot
Outlet	Name	URL	Power-On	Power-Off	Reboot	Duration
1	Mail Server		0	0	0	0

Figure 48: Outlet Configuration

- **Name:** A friendly name to easily identify what is plugged into the outlet. For example: “Mail Server”
- **URL:** A URL associated with the equipment plugged into the outlet. This will appear as a clickable link on the Control Actions Tab next to the outlet status information.
- **Power-On Delay:** Delay from the time the “On – Delayed” action is executed until the outlet will turn on.
- **Power-Off Delay:** Delay from the time the “Off – Delayed” action is executed until the outlet will turn off.
- **Reboot:** Delay from the time the “Reboot-Delayed” action is executed to the time the selected outlets will be turned off.
- **Reboot Duration:** Delay from the time the “Reboot” or “Reboot-Delayed” action is executed and each selected outlet has turned off until the outlet will turn back on.

Note: All delays are in seconds.

Power-On Actions

The state of each of the unit’s switched outlets on unit power-up is user configurable by setting a power-on action.

Available settings are:

- **Delay:** Used in conjunction with On and Last actions to allow sequencing of outlet power-up to prevent overloading circuit breakers with inrush current.
- **Off:** Leaves the outlet off until turned on manually via the Control Actions page.
- **On:** Turns the outlet on.
- **Last:** Returns the outlet to its state prior to the unit losing power.

Outlet	Name	Delay (seconds)	Action:		
			on	off	last
1	Mail Server	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Figure 49: Outlet Power-On Action Configuration

Tip: To emulate legacy RCM or RCU behavior for a particular outlet, set the delay to 0 and action to On.

Note: Outlets with their delay values set to 0 will perform the selected action immediately upon receiving power.

Note for units with built-in circuit breakers: Should one of the unit’s circuit breakers trip, upon being reset any outlets powered by that breaker will perform their power-on actions.

Accessories

Serial Communication (Delta Configured Units Only)

The Delta configured units provide an out-of-band, serial line, monitoring interface. The unit provides an RJ-45 port for RS-232 serial communication, giving monitoring via the command line similar to the Telnet service. If the administrator name and password are setup then they must be used to access the serial command line. Type "help" after logging-in to the unit to see a list of available commands.

Note: All data sent via the serial port is unencrypted. Some settings can be changed and user names and network settings are available.

```
Login successful.
Type 'help' or 'help all' for command list.
CLP> help

Format:  command [[optional args] | <required args>]

help    [<command name> | all] - HELP on a specific command or all details
reset   <parameter> - RESET specified parameters to factory default values
report  - REPORT settings and status
net     - List and set NETWORK settings
server  - List and set web SERVER configuration
mail    - List & set MAIL settings
snmp    - List & set SNMP parameters
account - List & set ACCOUNT Names & passwds
admin   - List & set contact ADMIN information
fcal    - Factory CALibrate a sensor (contact support for instructions!)
fconf   - Factory CONFigure an External sensor (contact support!)
bye     | exit | quit | ^D (EOT character) - End Login session

sensors - list <sensor id> numbers, measurement Labels, and values
alarms  - List all alarms. {Use 'alarms sensors' to get <sensor id>'s}
control - List all outlets and present status
```

Figure 50: Serial Command

RSD2X8 Remote Display

This small module comes standard with any Wye configured vertical units (optional for Delta and Horizontal units) and can be mounted in an accessible spot inside or outside the rack or cabinet. A backlit LCD display scrolls the values of items selected on the *Logging* page. The display is connected to the main unit via a 4-conductor handset-style cord. The display's onboard buzzer can be used in conjunction with E-Mail and SNMP to provide local alarming of error conditions. The buzzer can be silenced via the button on the face of the module; however the display's LED indicator will remain lit until the alarm condition is cleared.

IP-Addressable Network Cameras

The unit is able to interface with up to four IP-addressable network cameras. A live snapshot from each camera will be displayed on the unit's *Sensors* page underneath the main unit's graph. Clicking on a snapshot opens the camera's website in a new browser window.



Figure 51: Camera Images

Camera model and IP address are entered on the *Monitoring* tab of the *Configuration* page.

Note: Some cameras require additional software downloads to display live video in a web browser.

RSC Integration

For users with multiple units, Geist RSC software offers:

- Convenient, single-window monitoring of multiple units via simple web-based interface
- Streamlined firmware updating
- Consolidation of alarm settings

See <http://www.geistmfg.com/> for more information.

Alternate Data Formats

In addition to the full access, control and configuration available via a desktop web browser, RCX, RCU-O and RCM-O Series products present data in multiple formats for easy integration with other monitoring systems. Data formats available via links on the unit's web page are:



Figure 52: Alternate Format Links

- PDA/Phone: Presents data in a format best-suited for PDA or cellular phone web browsers.
- XML: Extensible Markup Language. Presents data in a structured tree for use with automated scripts and monitoring systems.
- MIB: Management Information Base. Downloads the MIB for use with SNMP monitoring tools.

Technical Support

Firmware Version

The firmware version is located in the upper right section of the web interface header, represented by v3.y.xx. Before contacting support, it is recommended that the PDU first be updated to the latest firmware version. If this is not possible, please have the existing firmware version number for the unit available when contacting technical support.

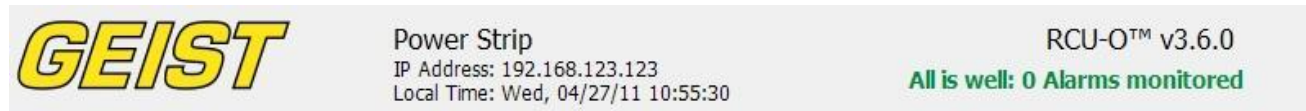


Figure 53: Web Page Header

Firmware Updates

Keep your unit updated with the latest firmware releases or sign up for notifications. <http://geistmfg.com/geistus/docs/downloads.htm>.

Resetting PDU

Should the PDU lose communication, the processor may be manually rebooted without affecting power to the outlets. Pressing the 'Reset' button on the face of the unit will cause the processor to reboot. The web interface will remain off-line during boot up.

Service and Maintenance

No service or maintenance is required. Do not attempt to open the PDU or you may void the warranty. No serviceable parts inside. It is recommended that power be removed from the unit before installing or removing any equipment.

More Technical Support

<http://www.geistmfg.com>
(800) 432-3219
Email: support@geistmfg.com
Or contact your distributor.

Table of Figures

Figure 1: Full Length Bracket	7
Figure 2: Mini "L" Brackets	7
Figure 3: Vertical Extension Brackets	8
Figure 4: Toolless Mounting Hardware	8
Figure 5: Toolless Full Length Bracket	9
Figure 6: Single Side Mount 2 Unit Brackets	9
Figure 7: Offset/Side Mount Brackets	10
Figure 8: 7" Extension Brackets	10
Figure 9: Flush Mount Brackets	11
Figure 10: Adjustable Mount Brackets	11
Figure 11: Panel Mount Brackets	12
Figure 12: 23" Conversion Mounting Brackets	12
Figure 13: 19" Horizontal/Panel Mount Brackets	13
Figure 14: Windows XP network settings for initial setup	14
Figure 15: MacOS X network settings for initial setup	15
Figure 16: Sensors Page – Wye Configuration	16
Figure 17: Sensors Page – Delta Configuration	17
Figure 18: Sensors Page – Group and Sensor Data	17
Figure 19: Logging Page	18
Figure 20: Display Page	19
Figure 21: Alarms Page	20
Figure 22: Control Actions Tab	21
Figure 23: Control Settings Tab	22
Figure 24: Configuration Network Tab	23
Figure 25: Configuration Monitoring Tab	24
Figure 26: Configuration Diagnostics Tab	25
Figure 27: Configuration Event Log Tab	26
Figure 28: Configuration Admin Tab	27
Figure 29: Network Configuration	28
Figure 30: Manual Time Settings	29
Figure 31: NTP Time Settings	29
Figure 32: Time and Date Display	30
Figure 33: E-Mail Configuration	30
Figure 34: Email Report Settings	31
Figure 35: SNMP Configuration	31
Figure 36: Initial SNMP V3 Data	31
Figure 37: Account Configuration	32
Figure 38: Configuration and Supported Models	33
Figure 39: Admin Information Fields	34
Figure 40: Admin Information Display	34
Figure 41: Kilowatt Hours Reset	34
Figure 42: XML File Upload	35
Figure 43: SSL Certificate and Private Key Upload	35
Figure 44: Alarm State Menu	36
Figure 45: Outlet Actions	41
Figure 46: Outlet Action Confirmation	41
Figure 47: Outlet Configuration	42
Figure 48: Outlet Power-On Action Configuration	42
Figure 49: Serial Command	43
Figure 50: Camera Images	44
Figure 51: Alternate Format Links	44
Figure 52: Web Page Header	45

Revision History

Revision	Date	Notes	Approved By
0.0	4/27/11	Initial Delta Version	CG
0.1	10/14/10	Original RCM-O/RCU-O – GM1085	BP
0.2	10/15/10	Original RCX – GM1094	BP
0.3	5/3/11	Combined RCM, RCU, RCX with Delta configuration	CG
1.0	5/10/11	Initial Combined Version	CG
1.1	5/11/11	New Alarms Image	CG
1.2	7/29/11	Edits - LCD added to RCU-OH	CG