SmartZone™ Gateway EPA126

Firmware v.2.04.xx

User Manual

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SmartZone Gateway EPA126 User Manual
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Introduction

The SmartZone™ Gateway EPA126 is a compact device used to monitor and control up to 6 PDUs and 12 multifunction inputs (temperature, humidity, voltage, and digital inputs).

The unit comprises both an SNMP interface and a secure web-based interface for monitoring and management.
Some of the main features of the EPA126 unit are:

- Secure web management and configuration interface.
- SNMP enabled.
- 12 monitoring channels.
- Monitoring of up to 6 PDUs.
- Optional LCD Status module.

Remote Temperature and Humidity Sensing

The Gateway EPA126 has the capability to monitor temperature and humidity and raise alarms or take action if a user-configured threshold is crossed.

PDU Monitoring

The EPA126, via intelligent PDUs, allows around-the-clock monitoring of the electrical power environment of the rack.

EPA126 Package

The standard EPA126 package contains a EPA126 unit with supporting hardware, including a localized mains lead.

Front of Gateway EPA126

The following image shows the front panel of the EPA126 unit:

LEDs

LEDs can be found on the front of the EPA126 unit. Their purpose is described below.

Network

- **Link** (green): Embedded in RJ45 Ethernet connection. Illuminates when an Ethernet link is established. Flashes with network activity.
- **Speed**(amber): Illuminates when 100mbps connection is used.

Status

- **CPU**: Indicates system activity.
- **Alarm**: Indicates any alarm condition.

Power

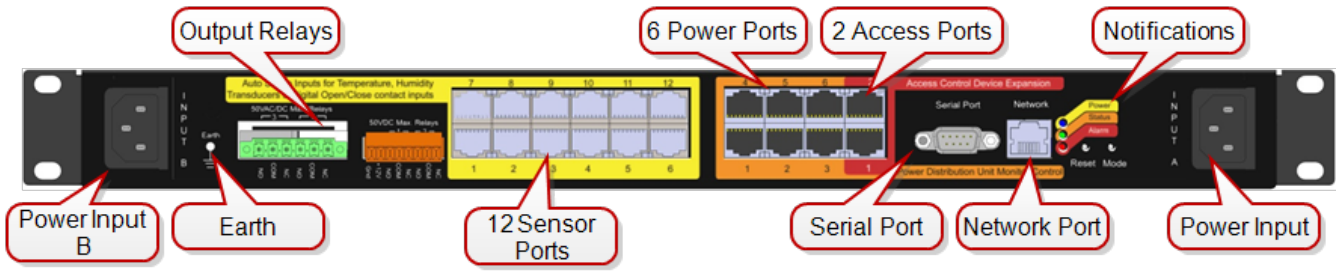
- **On**: Illuminates when unit is powered.
- **Feed B** (amber): Illuminates when mains power is present to input Feed B.
- **Feed A** (amber): Illuminates when mains power is present to input Feed A.

Buttons

There are two buttons on the front of the EPA126 unit:

- **Reset**: Allows the user to reboot the unit.
- **Mode**: The mode select switch is used to reset the unit to factory defaults. See the section for details.

Back of Gateway EPA126

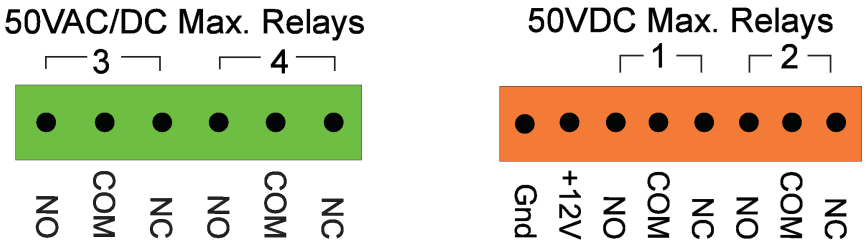


- **Power Input B**: Redundant mains or -48v DC voltage power feed.
- **Earth**: Grounding stud.
- **Output Relays**: Connect up to four output devices (such as Front and Back Electronic Swing Handles, and more).
- **Sensor Ports 1 through 12**: Connect up to 12 sensors (such as Temperature, Humidity, Water, Door Contacts, and more).
- **PDU Ports 1 through 6**: Connect up to six power devices (such as Gateway-Enabled Rack PDUs, Inline Meters, and Clamp Meters).
- **Access Ports**: Connect up to two access and control devices (such as Keypads or HID Card Readers). Must select one type (not mix and match).
- **Serial Port**: Attach optional devices (such as LCD Status Monitor Unit).
- **Network Port**: An RJ-45 port to connect Gateway to LAN/Network.

- **Notifications**: Reset/Mode/Power/Status/Alarm notifications duplicated from the Front Panel.
- **Power Input A**: Mains or -48v DC voltage.

Output Relays

Use the Output Relays to connect up to four output devices (such as Front and Back Electronic Swing Handles, and more).The following diagram shows the output relays of the EPA126 unit:



Installation Requirements

- SmartZone Gateway EPA126 unit.
- IEC mains lead (supplied localized).
- Ethernet or Fast Ethernet network connection.
- Network-connected computer system to setup the EPA126 Unit.

Rack Mounting

This section covers the basic 19-inch rack-mounting of the Gateway EPA126 unit.

Equipment Required

You need to supply a number-1 and a number-2 Phillips screwdriver to rack-mount the Gateway EPA126 unit.

Before You Begin

When determining where to install the Gateway EPA126 unit, please verify that these guidelines are met:

- Airflow around the Gateway EPA126 is unrestricted.
- Clearance to the front and rear panels meet these conditions:
- Front-panel LEDs can be easily read.
- Access to ports is sufficient for unrestricted cabling.
- AC power cord from the power supply can reach the AC power outlet and the Gateway EPA126.
- The 10/100 network cabling does not exceed 100 meters from the Gateway EPA126 to the Network switch.
- Temperature around the EPA126 does not exceed 40° C.
- Humidity around the Gateway EPA126 does not exceed 90%.

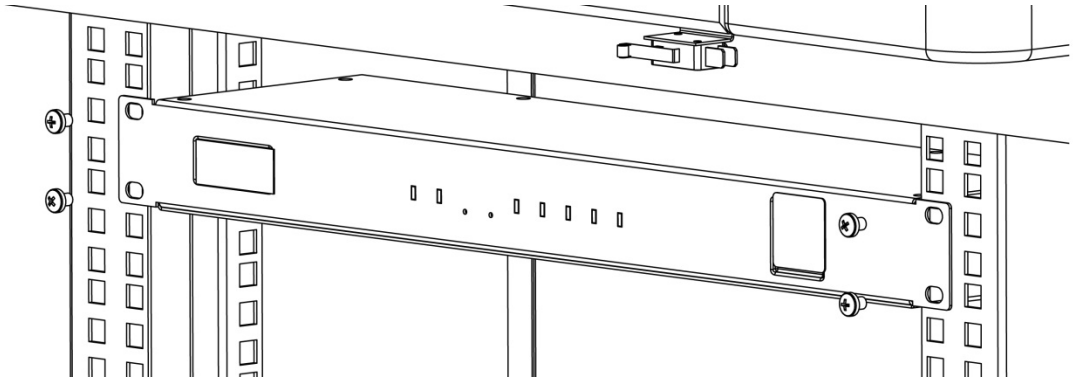
Installation Warning Statements

Note: Only trained and qualified personnel should be allowed to install, replace or service this equipment

- To prevent the Gateway unit from overheating, do not operate in an area that exceeds the maximum recommended ambient temperature of 40° C.
- Installation of the Gateway unit must comply with local and national electrical codes.
- To prevent personal injury when mounting or servicing the Gateway unit, ensure that the rack or cabinet is adequately secured so that the system remains stable.
- Circuit Overloading - Consult the equipment nameplate ratings when connecting the equipment to the supply circuit to avoid overloading of circuits. Overloading circuits can adversely affect current protection and supply wiring.
- Maintain reliable grounding of rack-mounted equipment. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, the use of PDUs).

Rack-Mount the EPA126

Hold the Gateway EPA126 and attach the bracket to rack using two 12-24 screws.



Initial Setup

Default Settings

The SmartZone Gateway unit in factory default condition has the following network configuration. Advanced users may wish to make use of these settings to access the Gateway unit's Web Management Interface immediately and proceed with configuration.

Users who do not know how to do this should proceed through this section for information on how to configure the Gateway unit.

IP Address	192.168.0.253
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.1
Web Management Address	http://192.168.0.253/
Default username	admin
Default password	admin

Note: Password entries are case-sensitive.

Connecting to the Web Management Interface

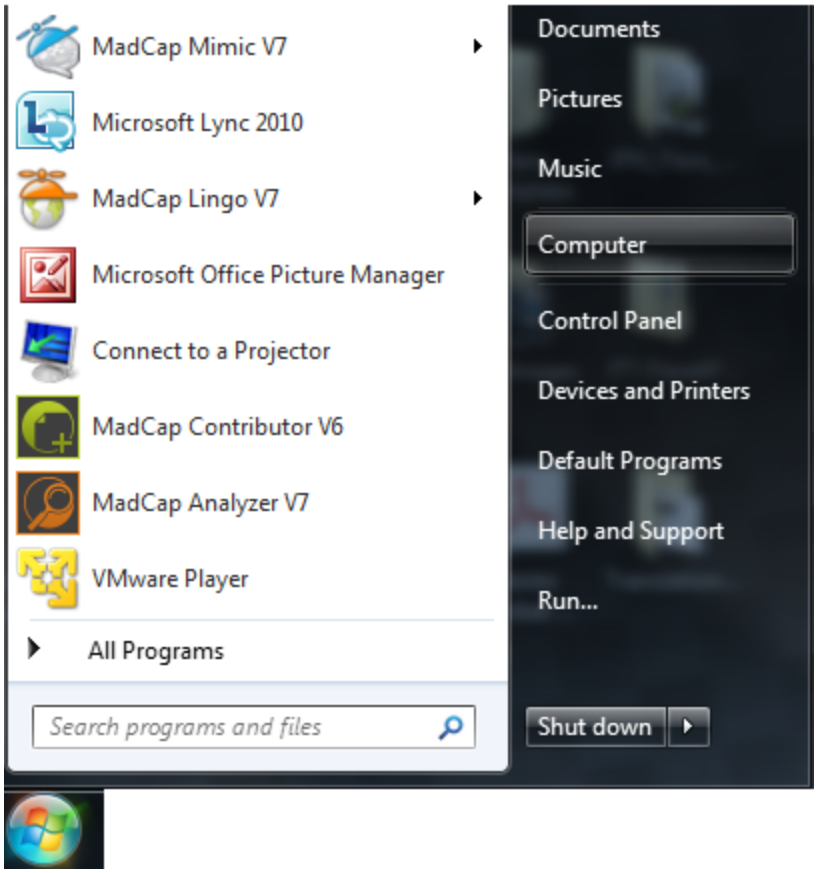
The SmartZone Gateway monitoring solution can be configured entirely using the built-in Web Management Interface.

You may need to change the IP address of the PC to connect to the Web Management Interface for the first time. The following section details how to change the IP address and connect to the Web Management Interface.

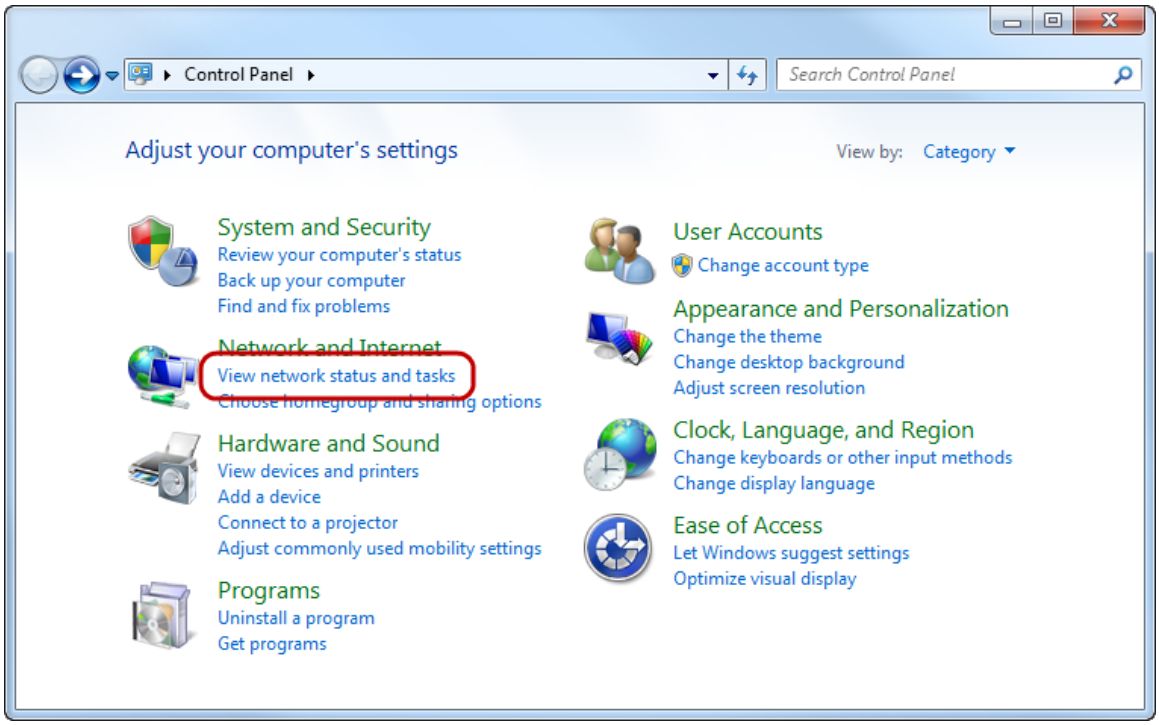
Changing your PC's IP Address

Note: Instructions refer specifically to Windows 7. Please refer to your operating system documentation if you are not using Windows 7.

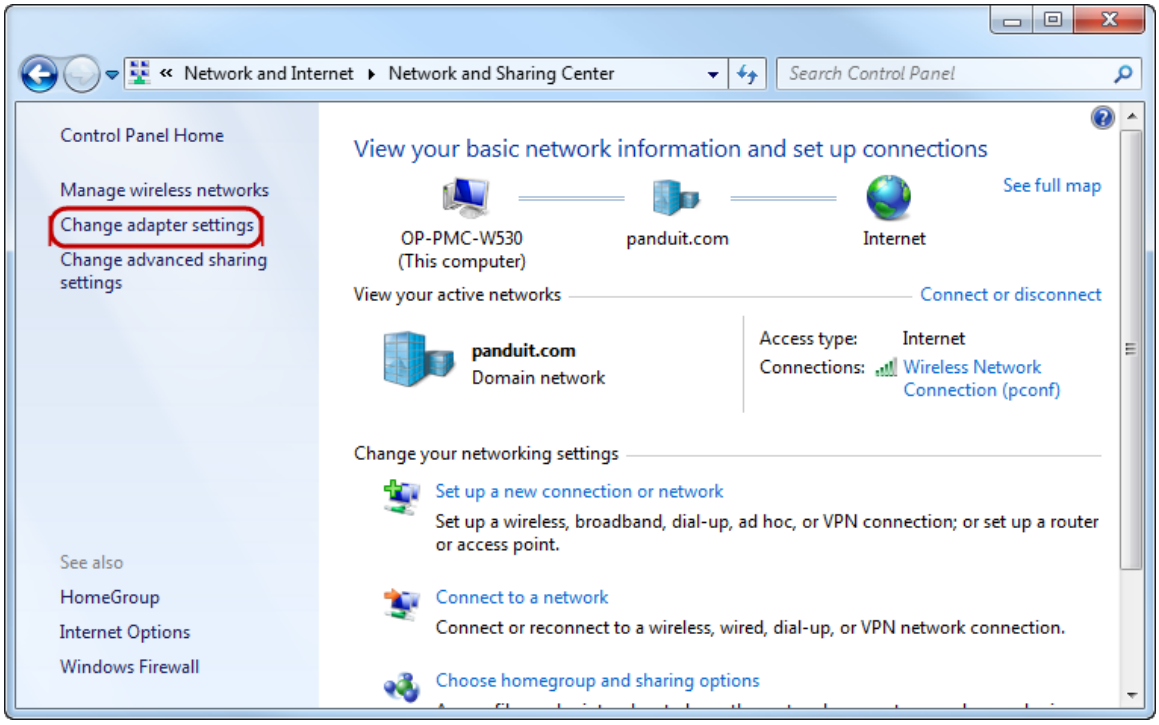
1. Click the Windows button and select **Control Panel**.



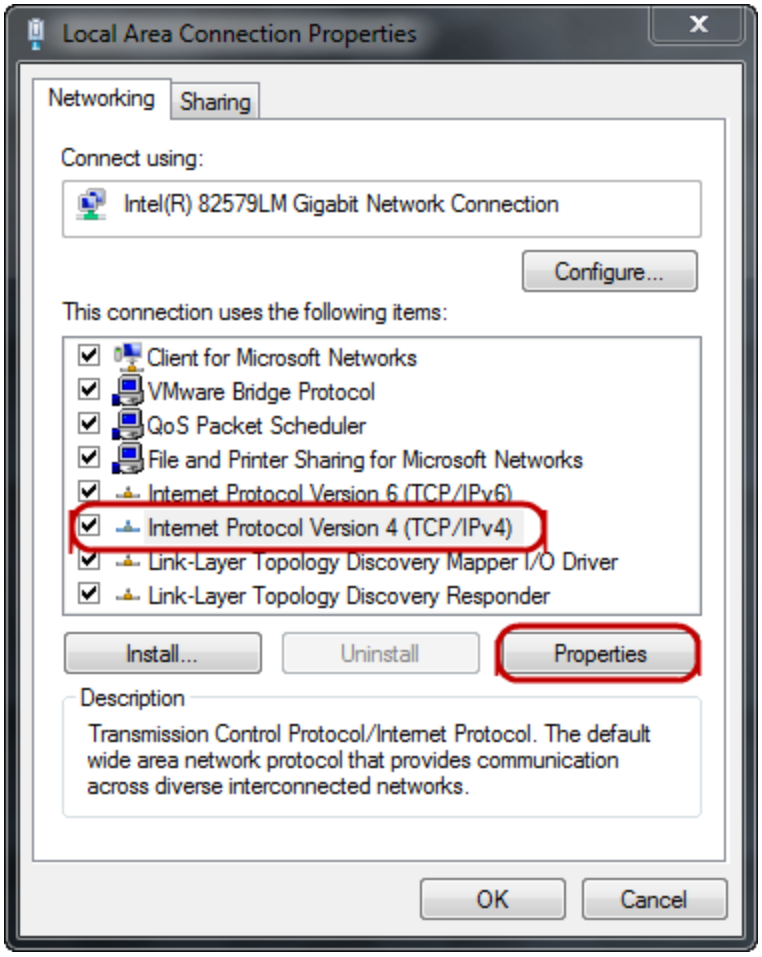
2. In the Control Panel window, select **View network status and tasks** under the Network and Internet heading.



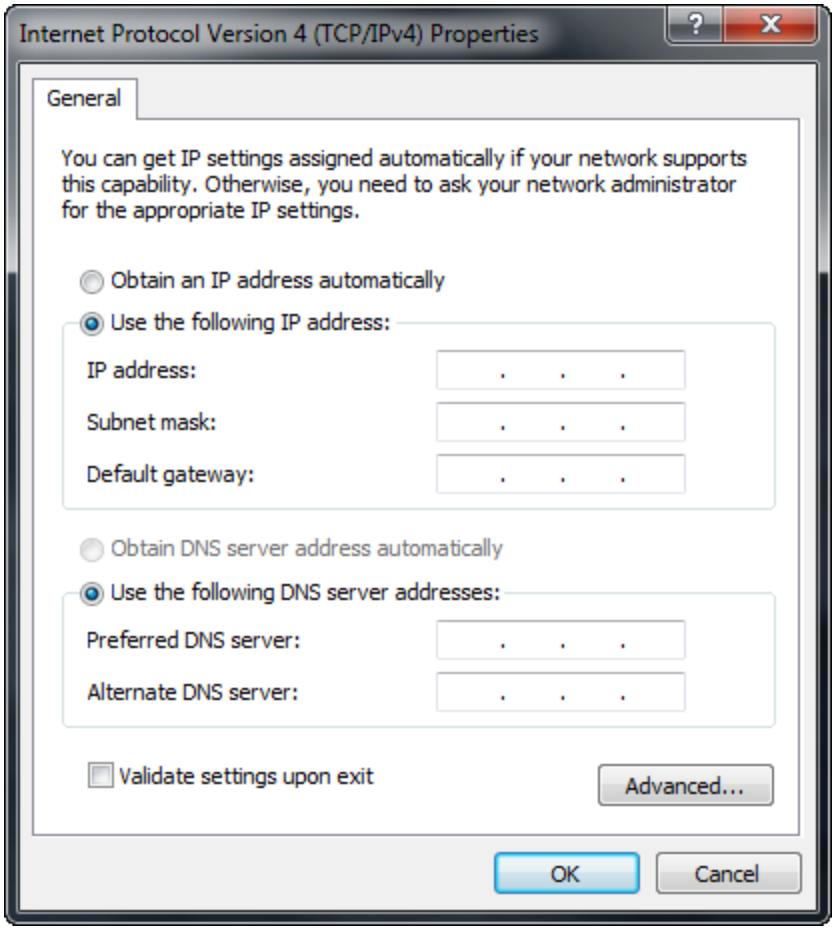
3. Select **Change adapter settings** from the menu on the left.



4. Select **Local Area Connection**.
5. Select **Internet Protocol (TCP/IP) Version 4** (you may need to scroll down). Then click the **Properties** button.



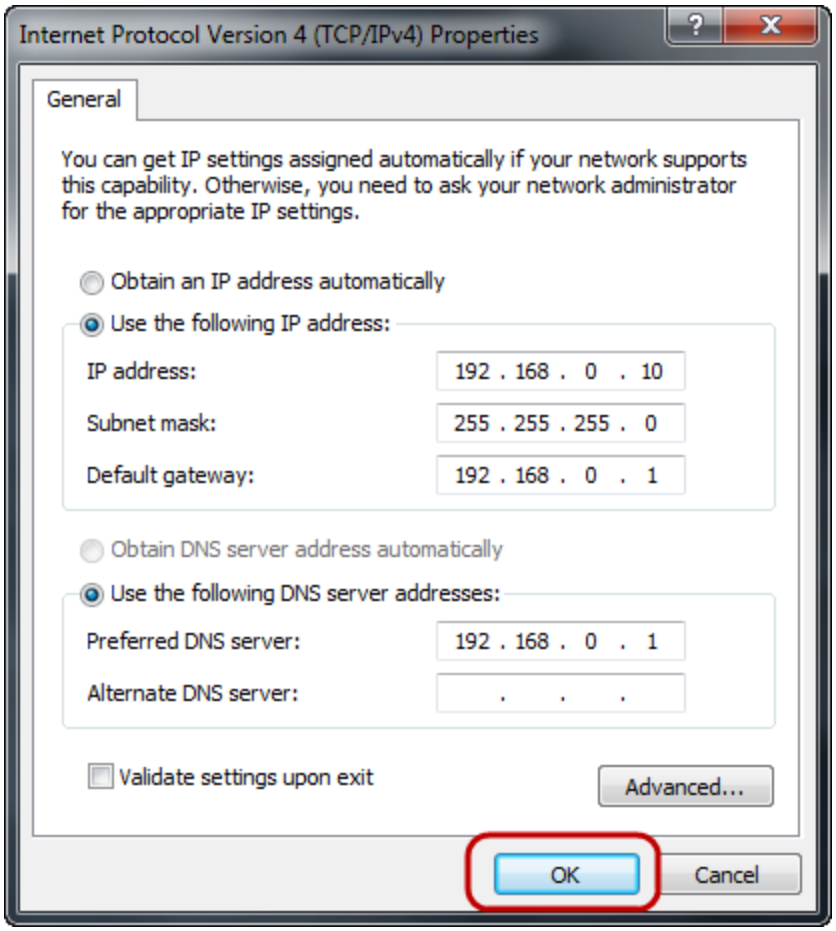
6. Select the **Use the following IP address** radio button.The **Use the following DNS server addresses** radio button then selects automatically.



Enter the following details into the appropriate boxes.

- **IP address:** 192.168.0.10
- **Subnet mask:** 255.255.255.0
- **Default Gateway:** 192.168.0.1
- **Preferred DNS server:** 192.168.0.1

7. Click **OK** to accept the entries.



8. On the Local Area Connection Properties, click **OK** to return to the desktop.

Connecting to the SmartZone Gateway Web Management Interface

1. Connect the SmartZone Gateway unit's network connection directly to a PC's Ethernet network card using a patch cable.

Note: A crossover cable must be used when directly connecting the Gateway unit to a PC's network card.

2. Power the Gateway unit.
3. Open a web browser.
4. Enter the following in the address field: `http://192.168.0.253`.
5. The Web Management Interface loads.

6. Click login and enter the username and password. The unit defaults are:

- **Login**: `admin`
- **Password**: `admin`

Note: Password entries are case sensitive.

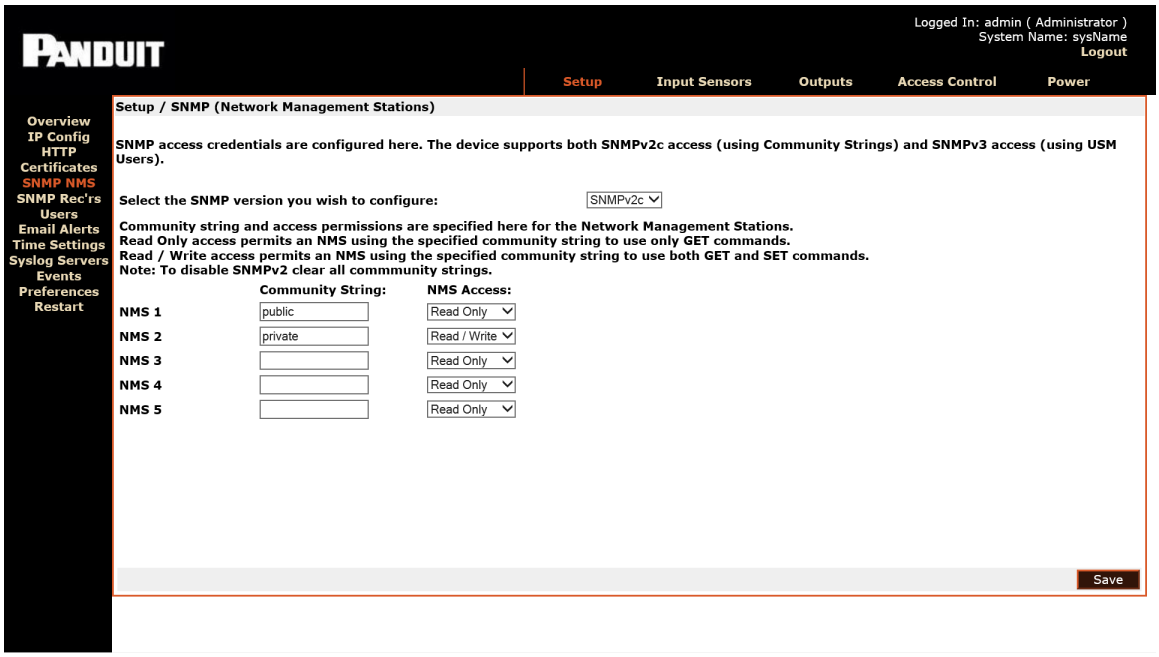
Initial Network Setup

This section provides details on preparing the unit for network access and allowing Simple Network Management Protocol (SNMP) network management.

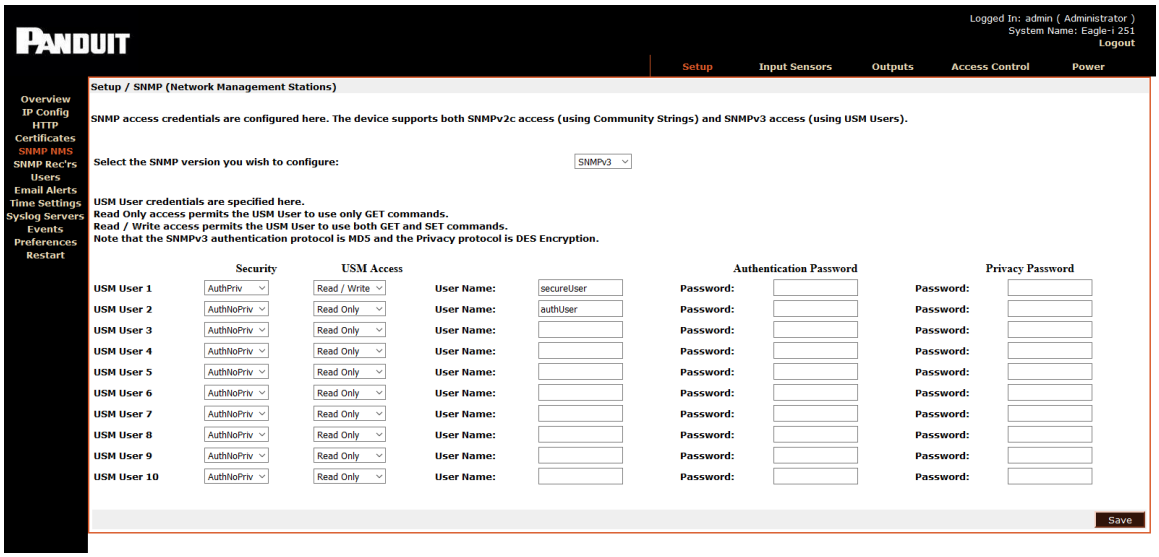
Connection to the Web Management Interface is required.

Entering NMS Details

1. Click the **Setup** tab on the top menu bar, and then select the **SNMP NMS** link on the left menu bar.



2. If you select SNMPv2, select the version of SNMP agent to be supported. Then set the SNMPv2 parameters (your chosen community string) and required Network Management Station (NMS) access permissions of the NMSs to be used.
3. Click **Save** to confirm the changes.
4. If you select SNMPv3, then you will need to enter additional parameters.



5. Security mode:

- AuthNoPriv – In this mode, access is granted only if the NMS is authorized (has a User Name and knows the password). The transfer of data between the gateway and the NMS is not encrypted in this mode.
- AuthPriv - In this mode, access is granted only if the NMS is authorized (has a user name and knows the password). The data transferred between the gateway and the NMS is encrypted. The encryption uses a shared secret “Privacy Password” which must be set in both the gateway and the NMS.

6. USM Access privilege:

- Read Only - In this mode, the NMS user will have read-only access to the SNMP MIB data objects.
- Read / Write - In ths mode, the NMS user will have read and write access to the SNMP MIB data objects.

7. User Name:

- Enter a user name to be associated with the Security/USM access model that has been defined for this user.

8. Authentication Password

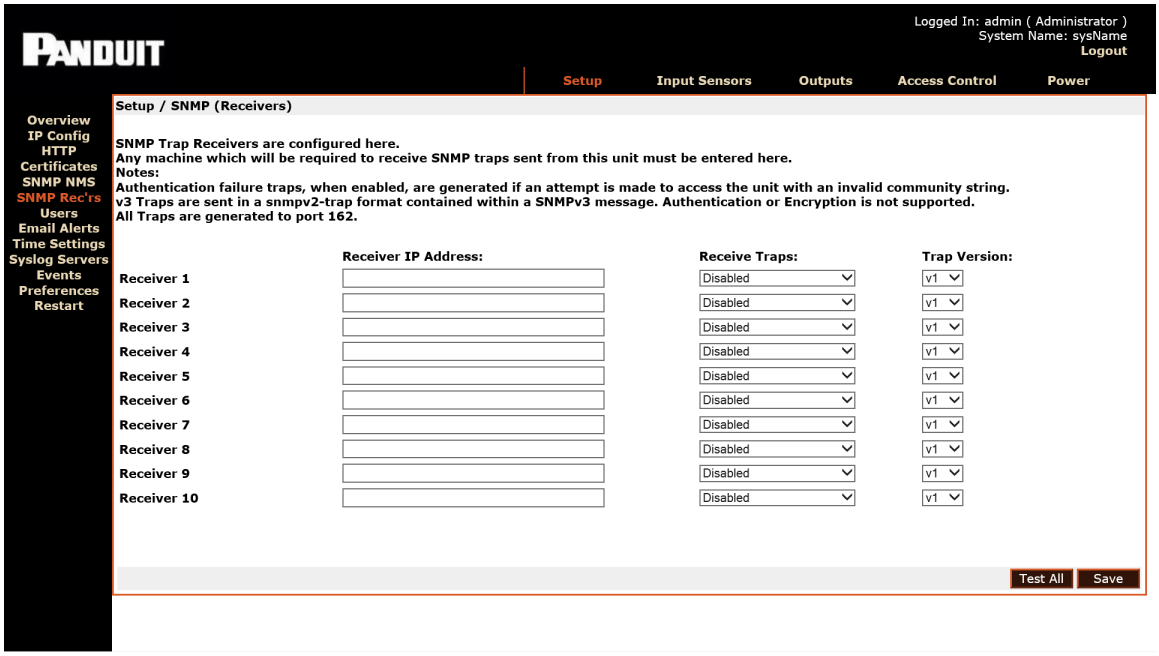
- Enter an authentication password for the user.

9. Privacy Password

- Enter a pass phrase to be shared with the NMS. This pass phrase is used to generate the encryption/decryption keys used for encrypting the SNMP data between the gateway and NMS.

Entering Trap Receiver Details

1. Click the **Setup** tab on the top menu bar.
2. Select the **SNMP Rec'rs** link on the left menu bar.



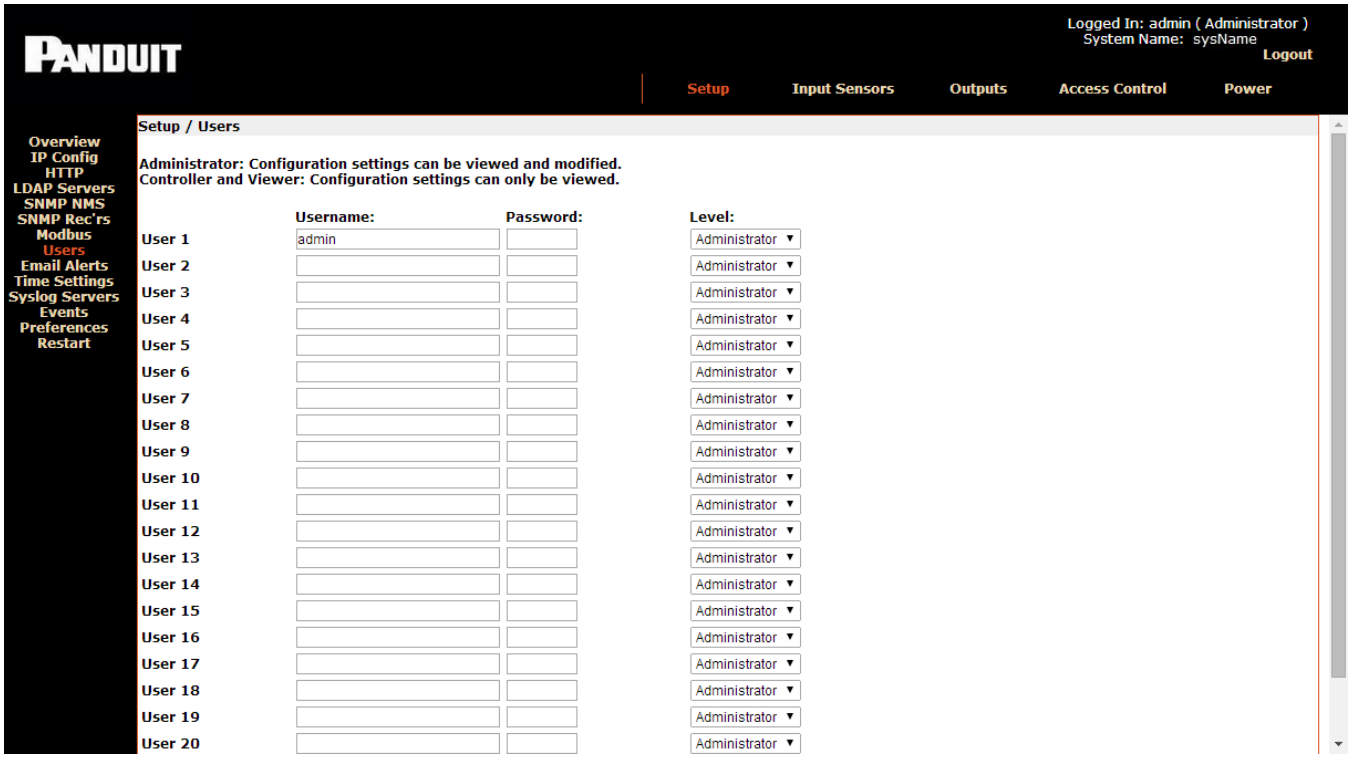
3. Enter the IP address.
4. Select the required trap version to v2 traps for v2.04.04 firmware.

- v1 SNMP Traps currently NOT supported.
- v2 SNMP Traps is the RECOMMENDED setting.
- v3 Notifications do not support encryption or authentication.

5. Choose whether to enable traps, disable traps, or enable traps including authorization failures (meaning the unit will issue traps if an unauthorized IP address attempts to access the unit's SNMP functions) for each receiver.
6. Click **Save** to confirm the changes.

Adding Users

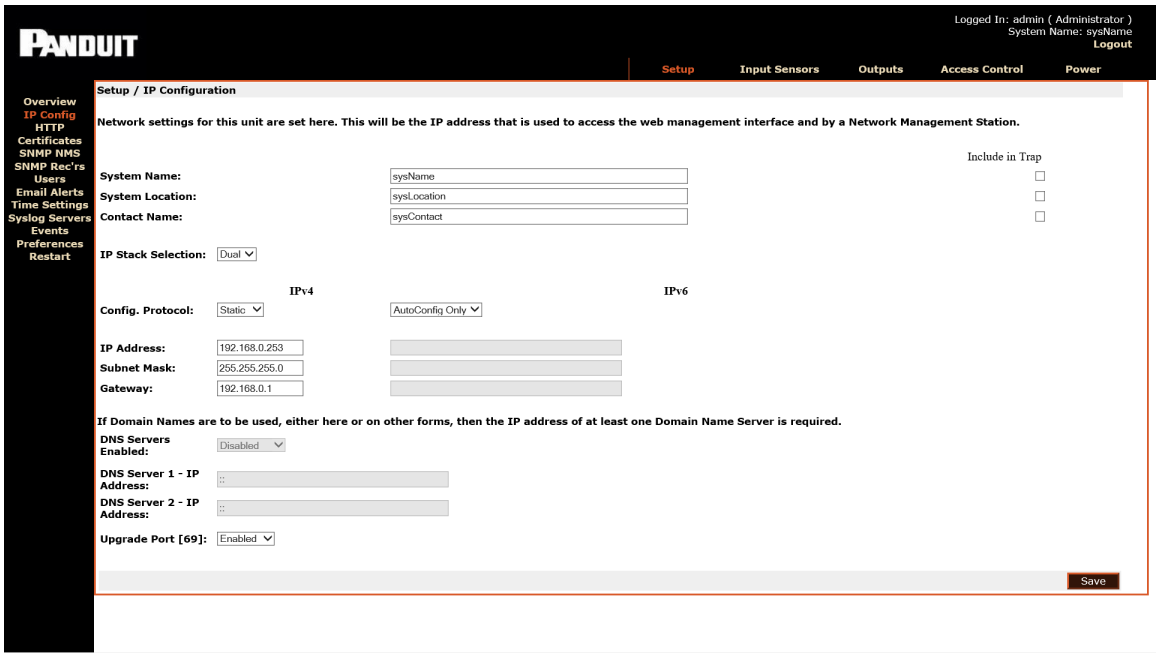
1. Click the **Setup** tab on the top menu bar.
2. Select the **Users** link on the left menu bar.



3. You can set usernames, passwords, and access levels here. Unique usernames can be set for individuals who require web management access to the Gateway unit.
4. Click **Save** to confirm the changes.

Changing the Unit IP Address

1. Click the **Setup** tab on the top menu bar.
2. Select the **IP Config** link on the left menu bar.



3. Set the IP Stack Selection to **Dual** – this is the only mode currently supported. Note: Selecting either of the other options is not supported.
4. Enter the IP Address, Subnet Mask, and the Gateway address that the SmartZone Gateway unit will use (required). Contact your network administrator if you do not know the values that you must enter here.
5. Select the Config. Protocol (**Static** or **DHCP**).
6. Enter the SNMP System Name, System Location , and Contact Name if required. These fields will be added to all SNMP traps generated by the unit.
7. Click **Save** to confirm the changes.
8. To prevent the firmware from being updated using the insecure TFTP, configure Upgrade Port (69) to **Disabled**.
9. Click **Restart** ,and then select **Restart Now** to reboot the unit and implement the changes.

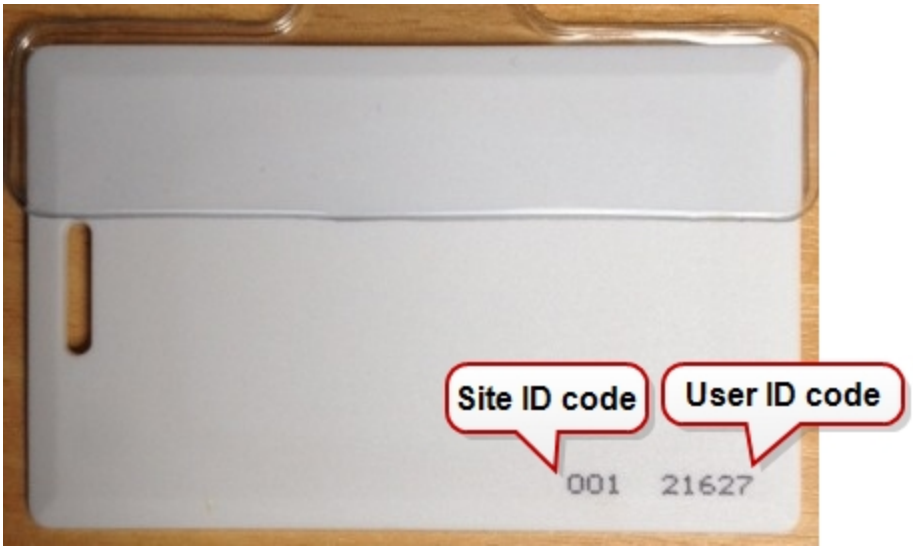
Note: Once the IP configuration has changed, the Gateway unit will no longer be accessible via the default IP address, because the new address will be operational.

The Gateway unit should now be connected to the main network and any further required configuration will be done via the unit's new IP address.

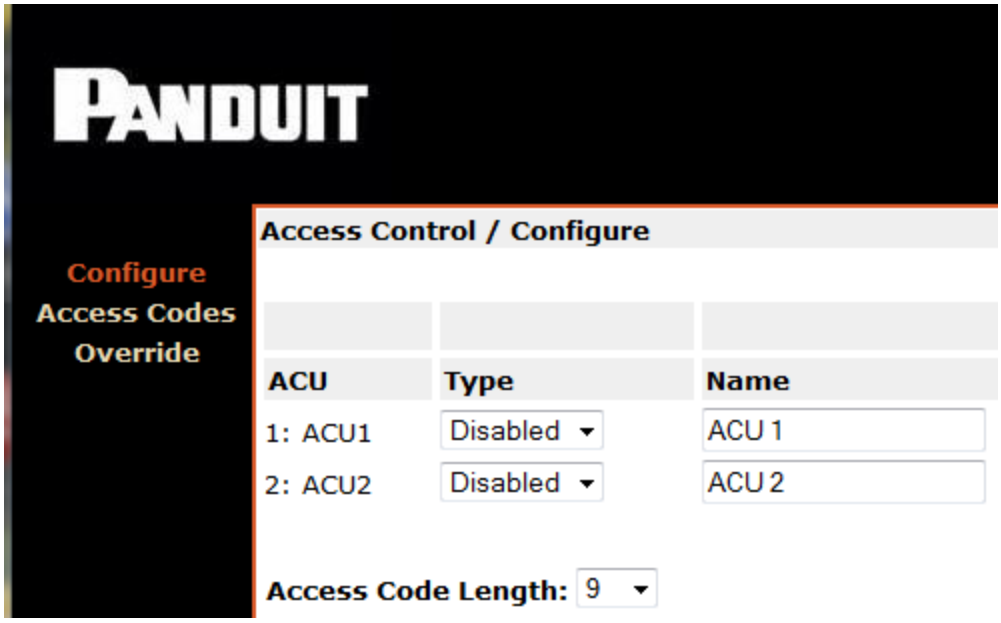
HID Reader

The SmartZone EPA Series Gateways include Smart Card readers that support HID 26 bit cards and HID Corporate 1000 cards.

HID 26 Bit Cards



For 26 Bit cards the Gateway interface must be programmed for nine digits.



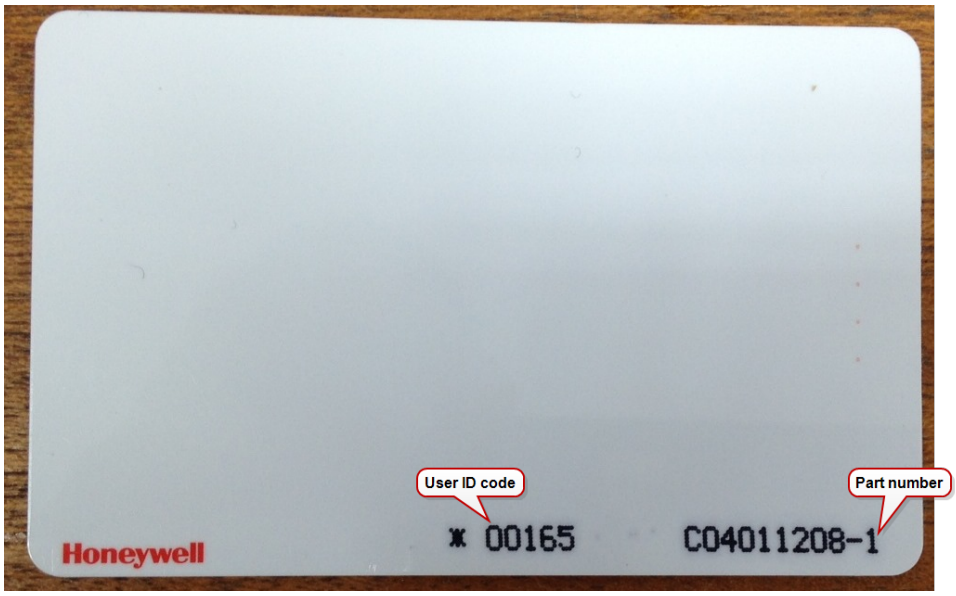
These nine digits consist of the following:

- 3-digit site code
- 1 hyphen
- 5-digit User ID code

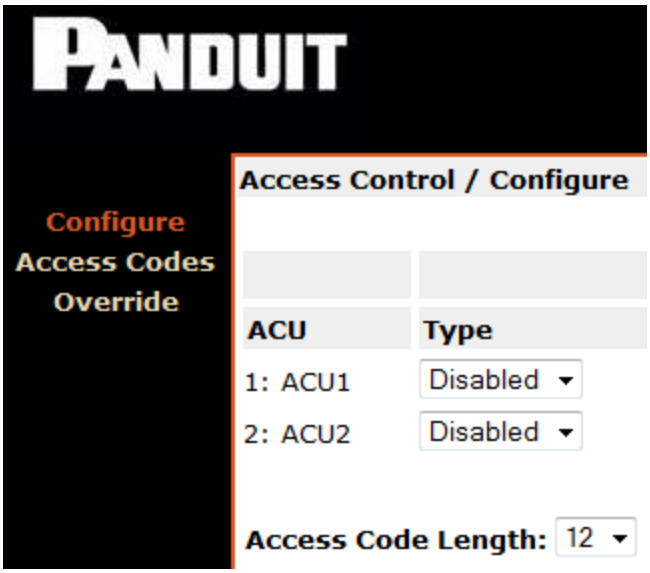
Example: 001-21627

Note: The hyphen character must be input (it is included in the length).

HID Corporate 1000 Cards



Corporate Site IDs are not normally printed on HID Corporate 1000 cards. This is confidential to each organization. You will need to ask the security office of the organization or supply company for the Site ID code, which is a four-digit number.
For 34 Bit Corporate 1000 cards, the Gateway interface must be programmed for 12 digits.



These 12 digits consist of the following:

- 4-digit site code
- 1 hyphen
- 7-digit User ID code

Example: 0001-2162731

Note: The hyphen character must be input (it is included in the length).

If the user ID code does not have seven digits, then the ID number must be padded out with leading zeros. Thus an ID code of “00165” becomes: “0000165”.

Example for a card with a 2033 Site ID: 2033-0000165

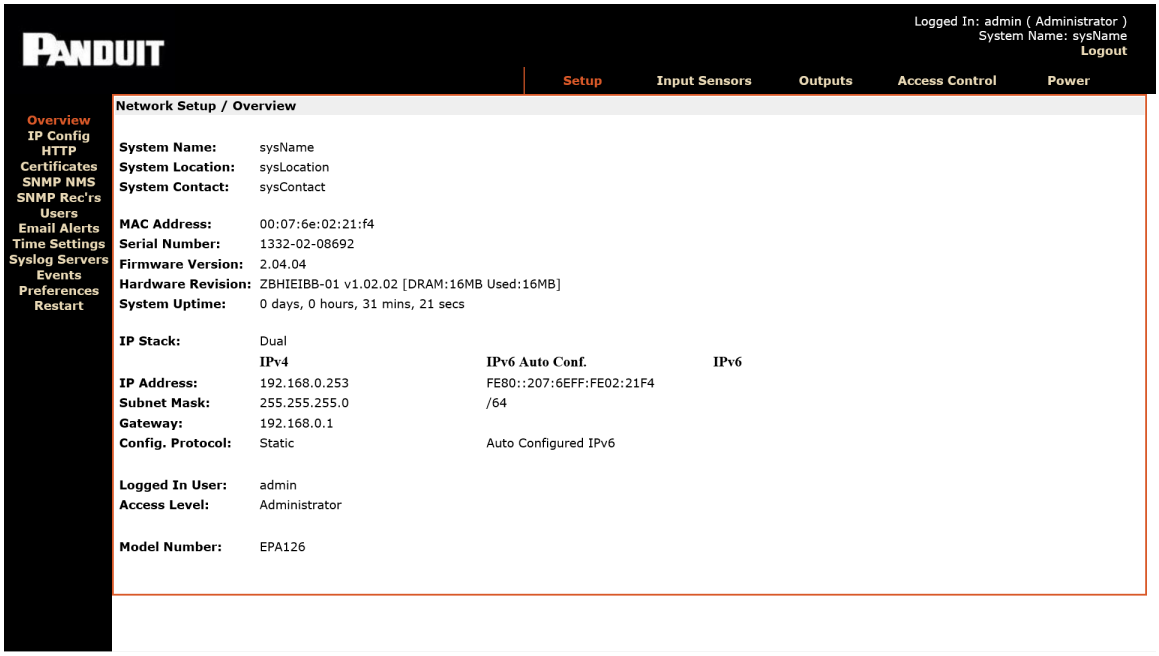
Web Management Interface

The SmartZone Gateway unit has a built-in Web Management Interface that can be accessed securely. The interface permits complete configuration and monitoring of the Gateway unit.

Windows where changes can be made have a **Save** button in the lower right-hand area. Click **Save** to activate and save any changes made.

Network Setup - Overview

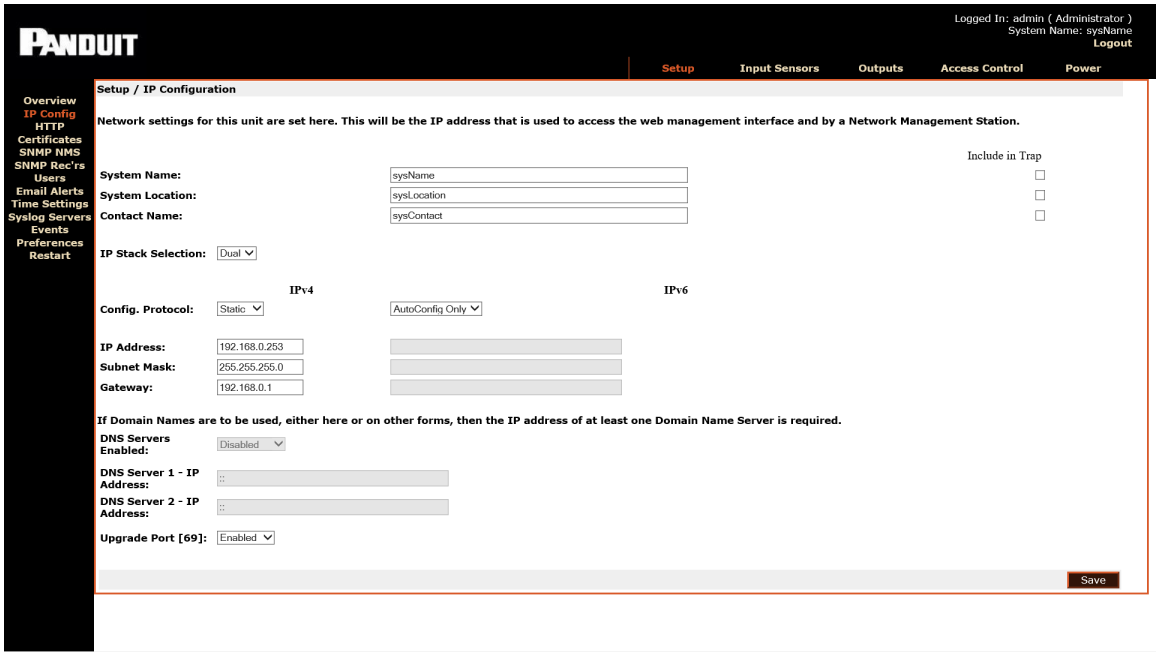
The Overview page is the first page displayed and provides the user with an overview of the Gateway unit's current status.



System name, MAC address, serial number, firmware version, and other system details can be found here.

Setup - IP Configuration

The IP Config page allows you to set the SmartZone Gateway unit's own management IP address.



System Name

You can specify the system name here. This is normally the Fully Qualified Domain Name (FQDN) of the device, but this is not enforced.

You can retrieve the value specified here by querying the sysName node via SNMP. This allows SNMP management platforms to obtain unique names for units where specified. This value has no effect on network communications, and the unit will function correctly with or without a value.

System Location

You can specify the system location here.

You can retrieve the value specified here by querying the ‘sysLocation’ node via SNMP. This allows SNMP management platforms to obtain location names for units where specified. This value has no effect on network communications, and the unit will function correctly with or without a value.

Contact Name

You can retrieve the unit support contact name by querying the ‘sysContact’ node via SNMP. This value has no effect on network communications and the unit will function correctly with or without a value.

IP Address

You can enter a standard IP address here. The address is entered in decimal format (for example: 192.168.0.44 or 22.10.45.33). The address entered here will be the address by which the Gateway unit is accessed and managed.

Subnet Mask

The subnet mask is used to determine what part of the IP address is the network portion and what part is the host portion.
It is often 255.255.0.0 or 255.255.255.0. The correct setting is essential for correct operation.

The subnet mask is entered in decimal format (for example: 255.255.255.0 or 255.255.224.0).

Gateway

The Gateway setting specifies the IP address of the machine/router that the Gateway unit uses to communicate with different networks.

The Gateway address is entered in decimal format (for example: 192.168.0.1 or 11.2.24.103).

Most networks will have a Gateway. Correct setting is important for correct network communications.

Config. Protocol

Select the configuration protocol. Choices include:

- Static
- DHCP

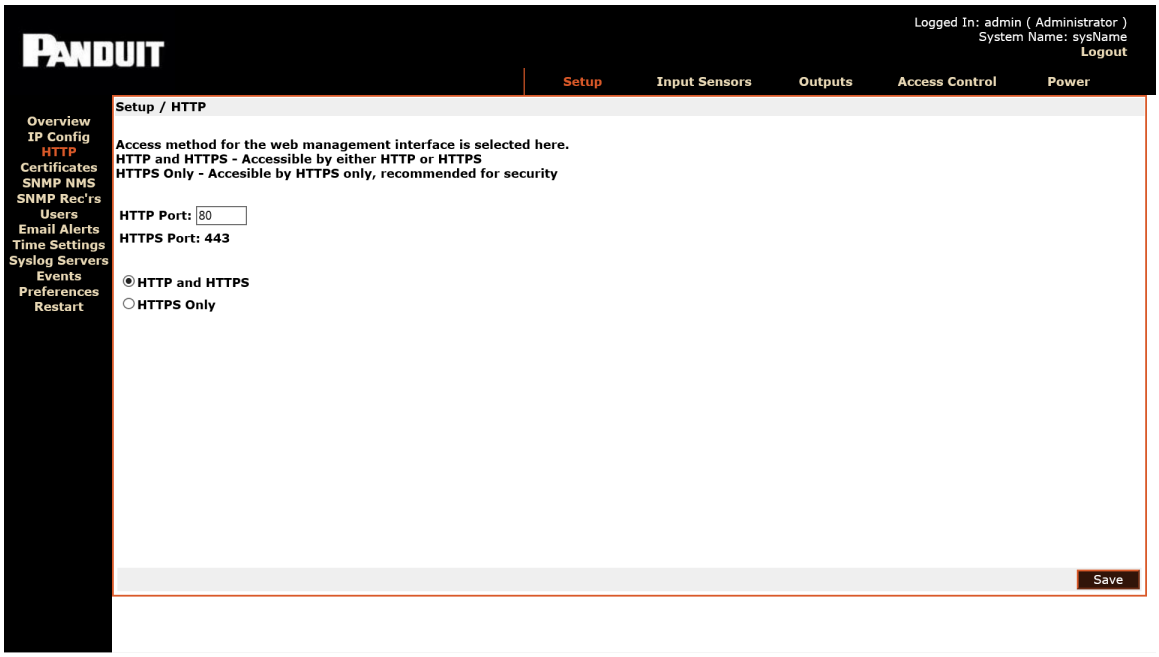
Upgrade Port

Upgrade Port provides a method for upgrading the Gateway firmware when a new version becomes available. Because this uses the TFTP protocol, users may wish to disable the port to prevent unauthorized updates.

Note: Once you enter the IP Configuration options and click **Save**, the changes take effect. If incorrect entries are made, this may result in loss of communication. If this happens, reset the Gateway unit's network configuration. Details of how to do this can be found in the Troubleshooting section.

Setup - HTTP

Select the access method for the Web Management Interface here. Both HTTP and HTTPS access modes are available by default. Selecting the **HTTPS Only** radio button will allow only HTTPS configuration.

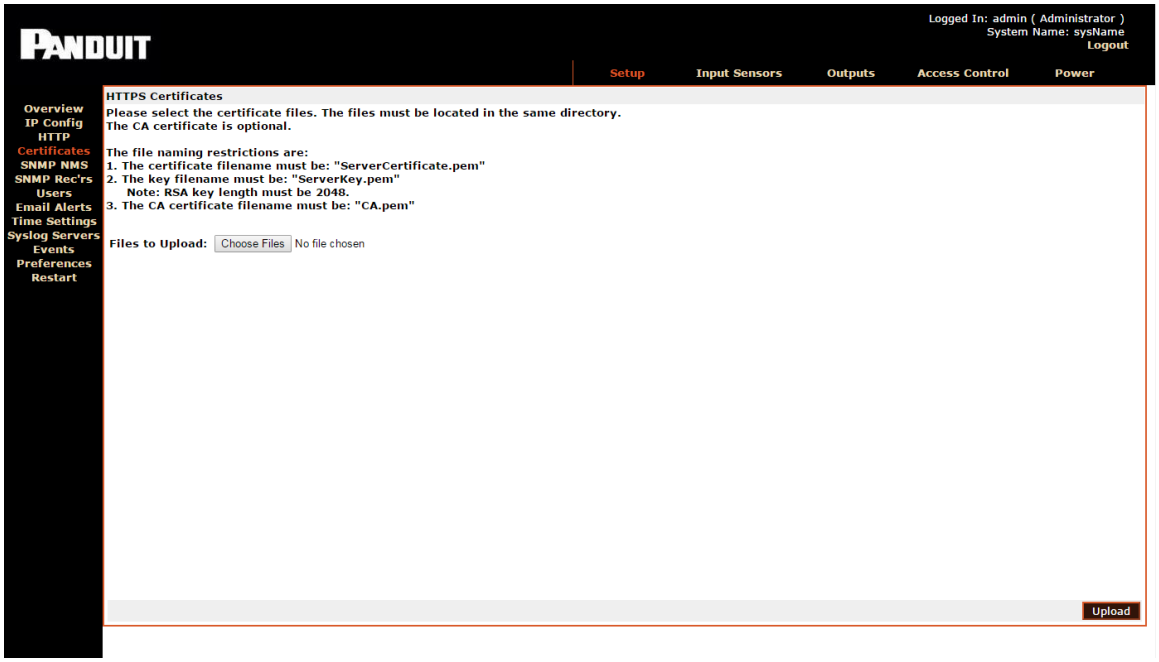


Use of HTTPS is recommended for security, because the connections will be encrypted.

Additionally, you can specify the TCP port for connection to the Web Management Interface here. If you have specific requirements for default ports, these can be left at their default settings (for example, port 80 for HTTP and port 443 for HTTPS).

Note: Changing the selection to HTTP or HTTPS requires a reboot for the selection to take effect.

Setup - Certificates



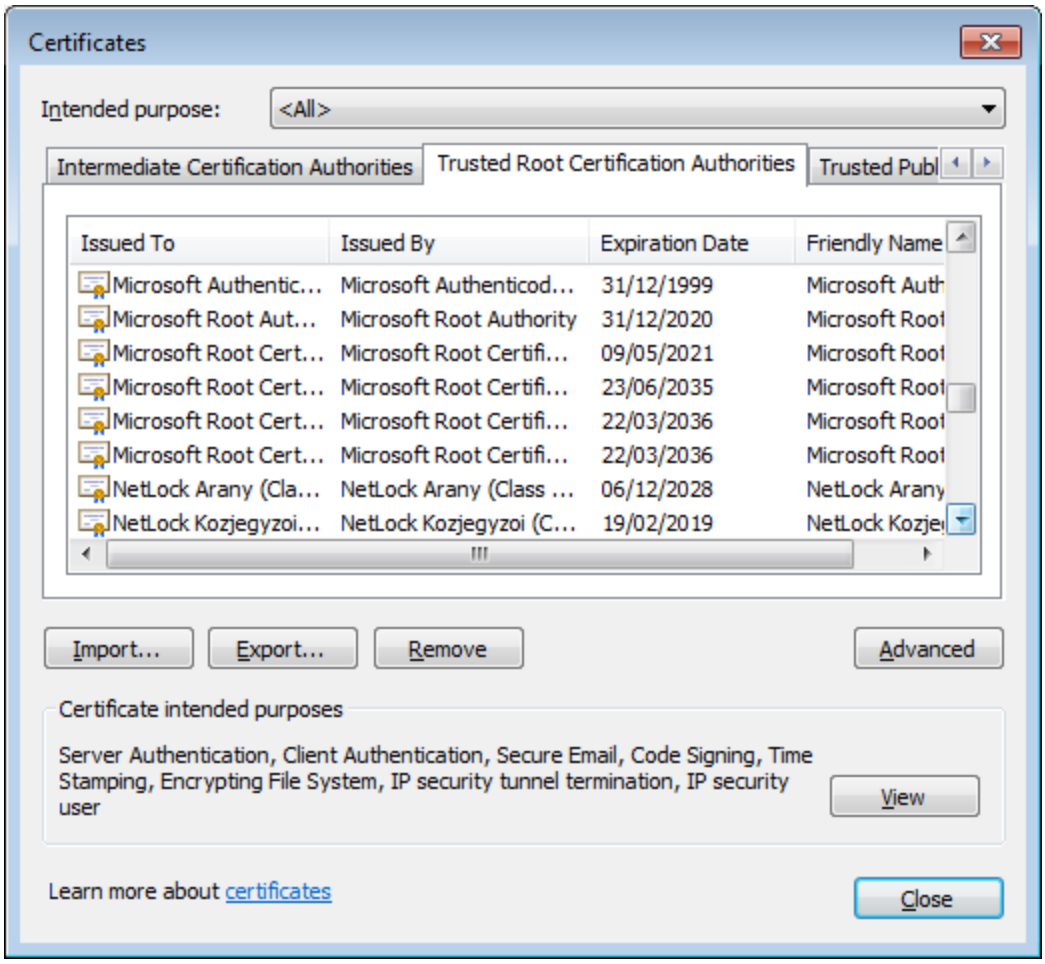
This web page will enable users to upload their own certificates (self-signed or CA certificates). The file names restrictions are listed on the web page.
The file naming restrictions are:

1. The certificate filename must be: "ServerCertificate.pem"
2. The key filename must be: "ServerKey.pem" **Note**: RSA key length must be 2048.
3. The CA certificate filename must be: "CA.pem"

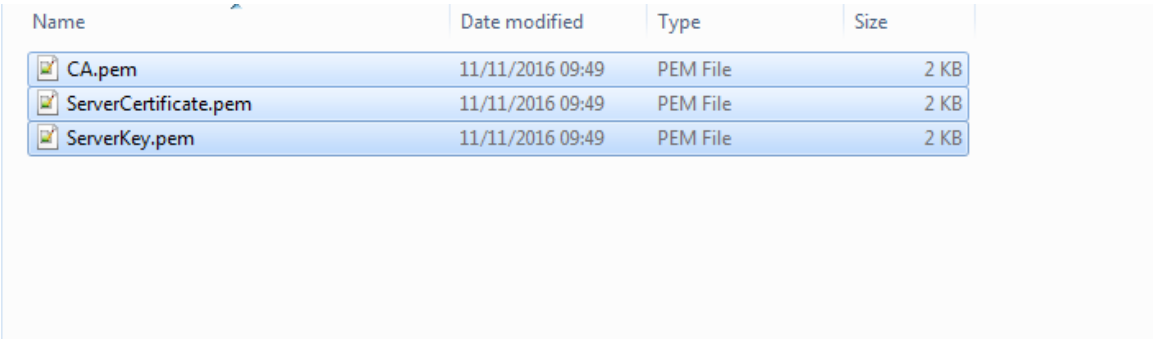
Application requires following CA (Certificate Authority) issued certificates:

1. CA.pem - CA certificate required for client certificate verification.
2. ServerCertificate.pem - CA signed server certificate with public key. This certificate will be sent to client during authentication.
3. ServerKey.pem - Server's RSA encrypted private key, required to decrypt client's random key.

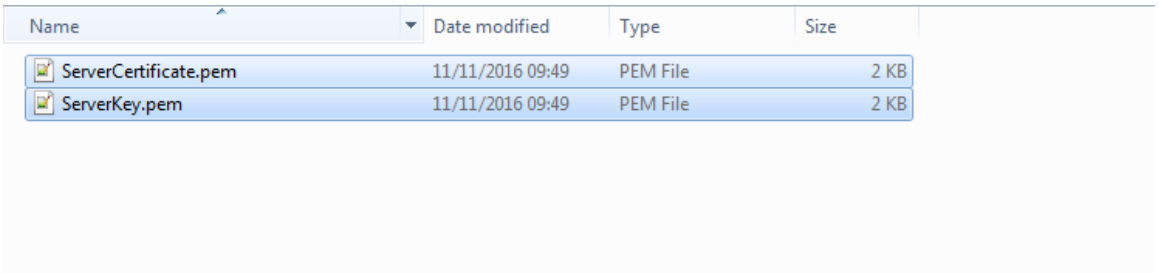
The CA certificates can be issued by a public or private Certificates Authority. The client browser must be configured to connect to the CA server to validate the certificate.



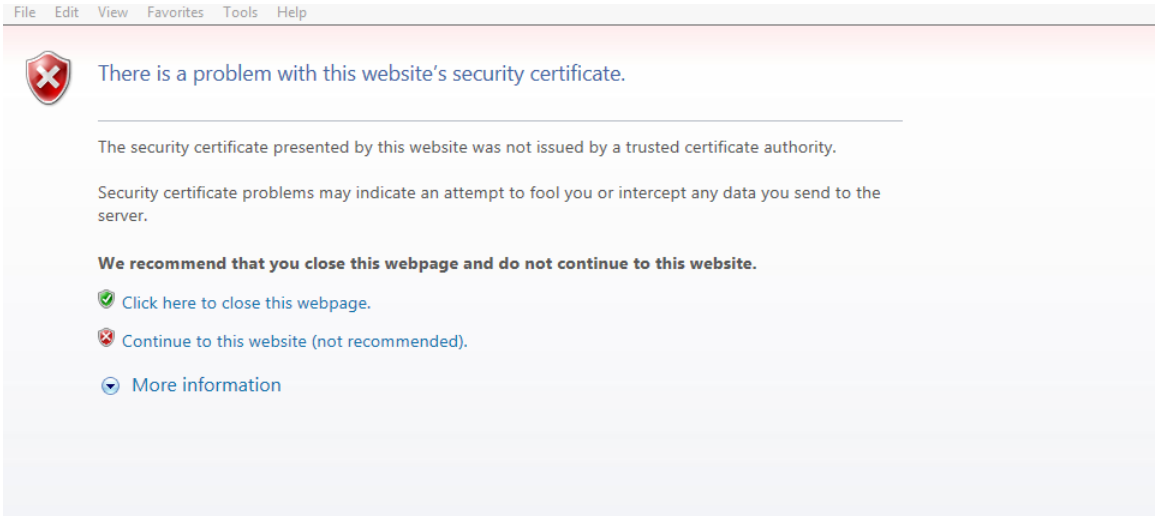
When uploading CA certificates, you must upload three files:



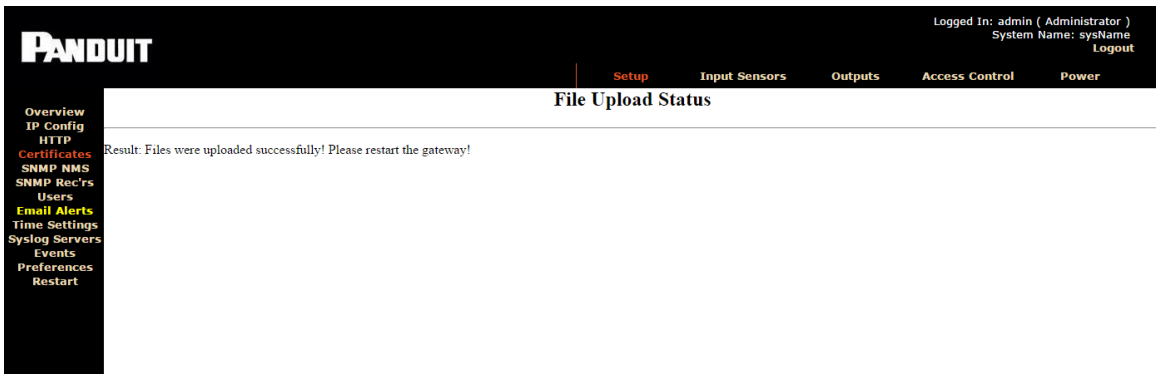
When uploading self-signed certificates, CA.pem is not required:



When using a self-signed certificate, the connection will be encrypted but a warning message will pop-up notifying the user that the certificate cannot be trusted.

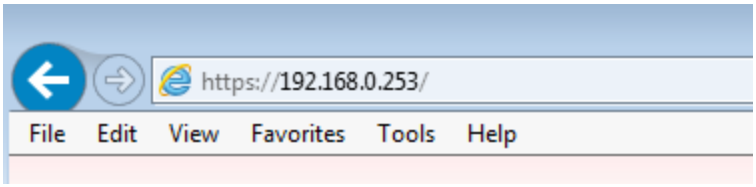


After uploading the certificates, the gateway will validate them and it will display the either success message:



Or the failure message:

After successfully uploading the certificates, restart the gateway to restart the web server using the new uploaded certificates. When contacting the device in secure mode, the user must make sure to add 'https://' in front of the IP address:



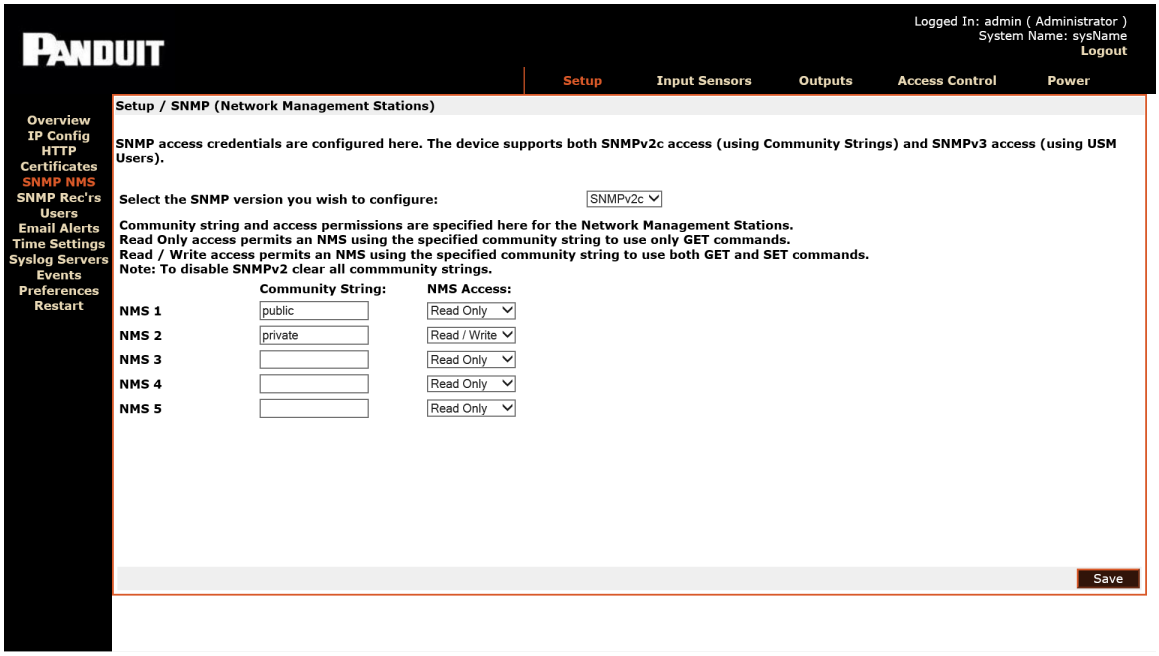
These are the commands to generate a self-signed certificate:

```
openssl genrsa -out ServerKey.pem 2048

openssl req -new -sha256 -key ServerKey.pem -out csr.csr -subj

"/C=UK/ST=Wales/L=Usk/O=Panduit/CN=192.168.0.253"

openssl req -x509 -sha256 -days 7300 -key ServerKey.pem -in
csr.csr -out ServerCertificate.pem

openssl req -in csr.csr -text -noout | grep -i "Sig-
nature.*SHA256" && echo "All is well" || echo "This

certificate will stop working in 2037!"
```

Setup - SNMP NMS

Specify the SNMP version, community string, and access permissions for up to five Network Management Stations here.

Any machine that needs to access the unit's SNMP functions must be entered here.



SNMP Version

Enter the SNMP version of the NMS machine here. If you select SNMP v3, follow the instructions in SNMP v3

Community String

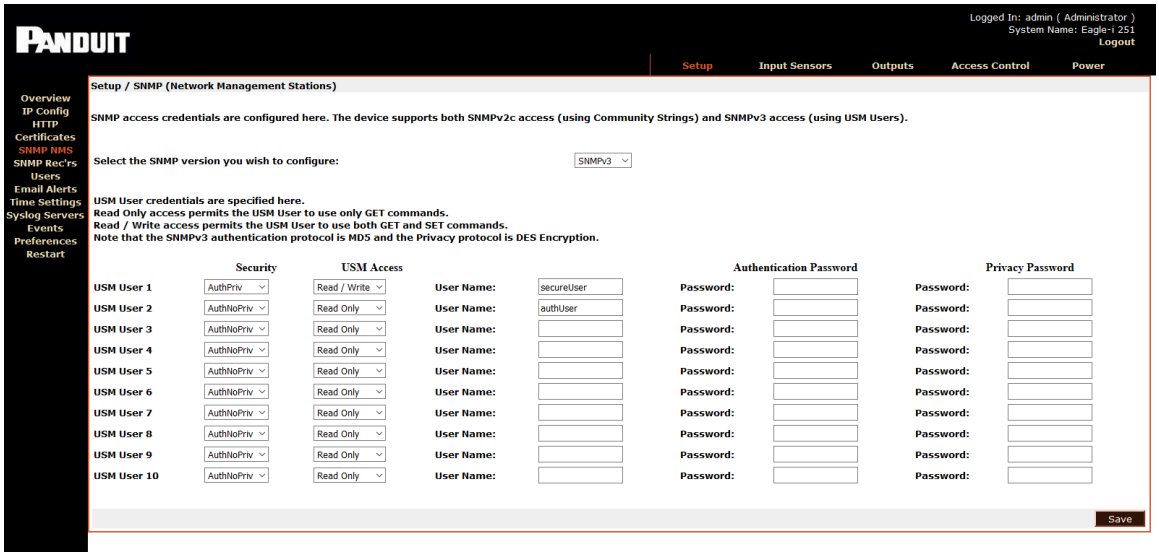
You must enter the required community string here. The default for many devices is **public**. It is recommended that the community string be changed, because it serves as an access password.

NMS Access

Read-only access permits the NMS to use only GET commands. Read/Write access permits the NMS to use both GET and SET commands.

SNMP v3

If you select SNMPv3, then additional parameters must be entered.



Security Mode

- **AuthNoPriv** – In this mode, access is granted only if the NMS is authorized (has a User Name and knows the password). The transfer of data between the gateway and the NMS is not encrypted in this mode.
- **AuthPriv** - In this mode, access is granted only if the NMS is authorized (has a user name and knows the password). The data transfers between the gateway and the NMS are encrypted. The encryption will use a shared secret “Privacy Password” which must be set in both the gateway and the NMS.

USM Access Privilege

- **Read Only** - In this mode, the NMS user will have read only access to the SNMP MIB data objects.
- **Read/Write** - In this mode, the NMS user will have read and write access to the SNMP MIB data objects.

User Name

- Enter a user name to be associated with the Security/USM access model that has been defined for the user.

Authentication Password

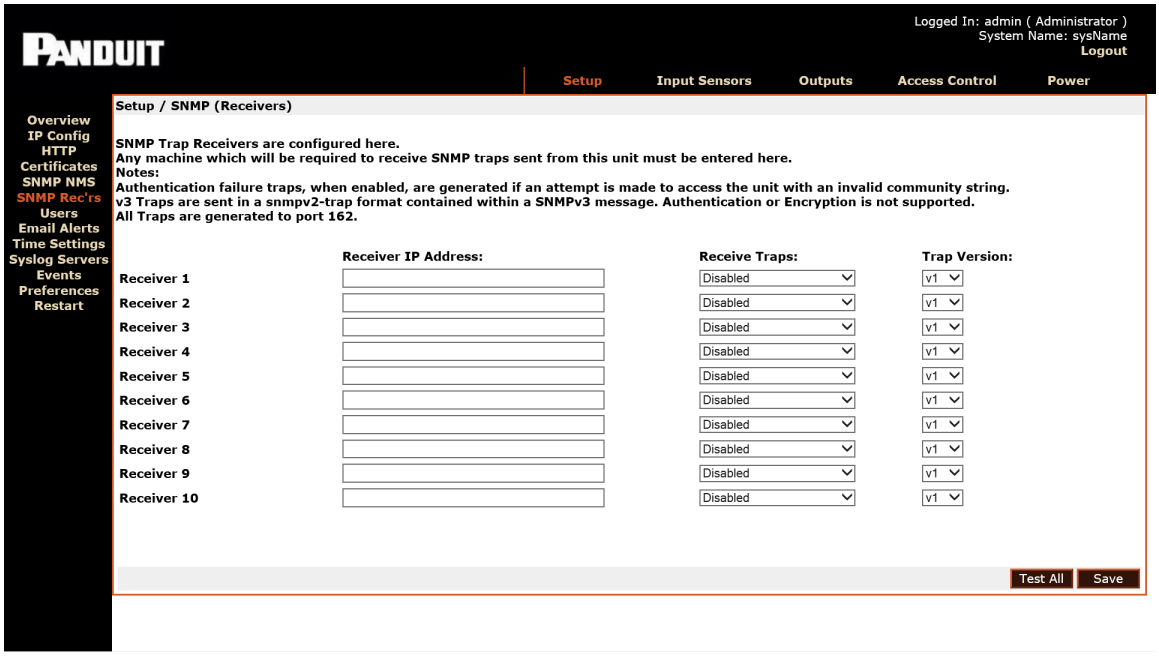
- Enter an authentication password for the user.

Privacy Password

- Enter a pass phrase that will be shared with the NMS. This pass phrase is used to generate the encryption/decryption keys used for encrypting the SNMP data between the gateway and NMS.

Setup - SNMP Receivers

Specify the IP address, community string, and access permissions for up to 10 Network Management Stations here.



Receiver IP Address

You must enter any machine that is required to receive SNMP traps sent from this unit. Usually any SNMP NMS entries should also be entered.

Trap Version

The required trap version must be selected here.

Select the required trap version to v2 traps for v2.04.04 firmware.

Notes:

- v1 SNMP Traps currently NOT supported.
- v2 SNMP Traps is the RECOMMENDED setting.
- v3 Notifications do not support encryption or authentication

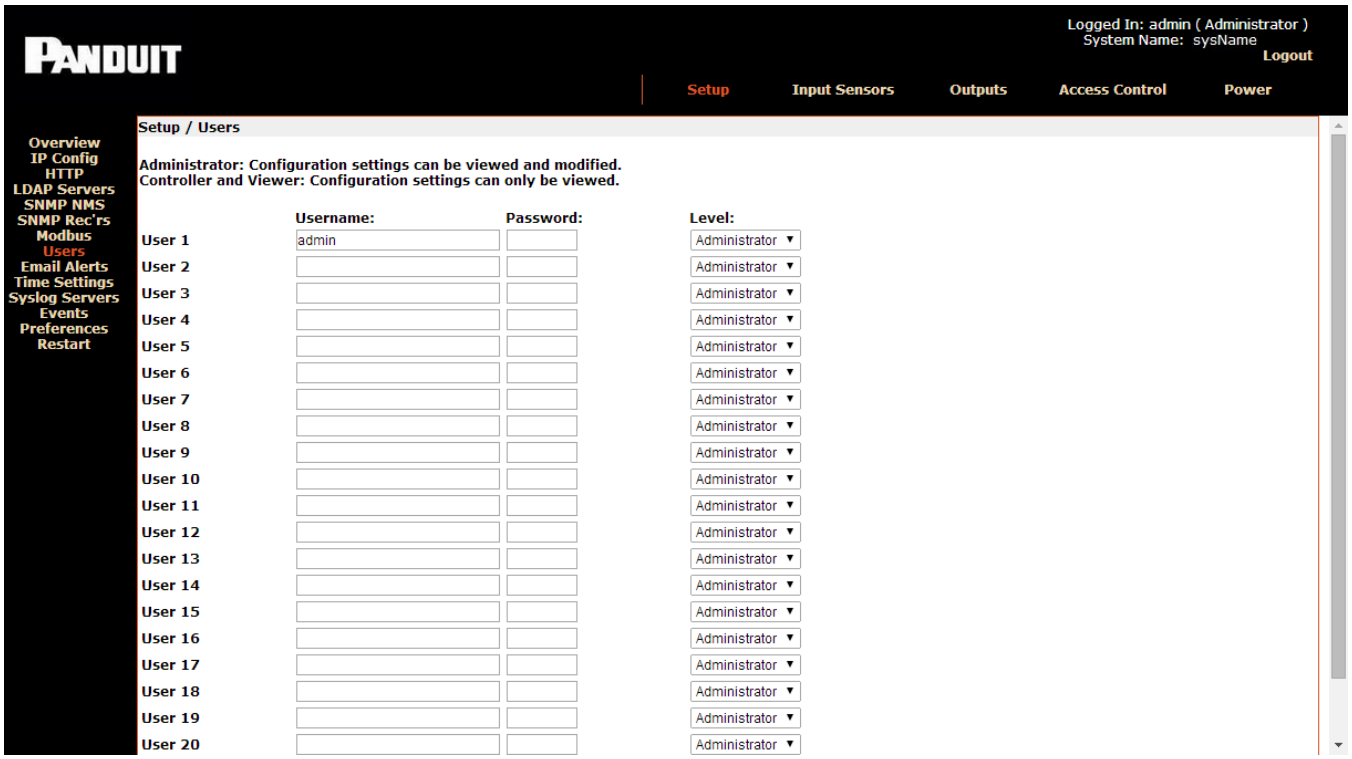
Receive Traps

The Receive Traps **Enabled** setting allows the specified NMS to receive the unit's standard range of traps. Receive Traps **Enabled (incl Auth fails)** will cause the unit to issue traps if an unauthorized IP address attempts to access the unit's SNMP functions.

Receive Traps **Disabled** prevents traps from being sent to the specified NMS IP address.

Setup - Users

You can add users with permission to access the Web Management Interface here. Access passwords are also specified along with users' access permissions.



Username

Enter the required username. This is the username that will be required to login to the Web Management Interface.

Password

Enter access passwords on a per-user basis.

Level

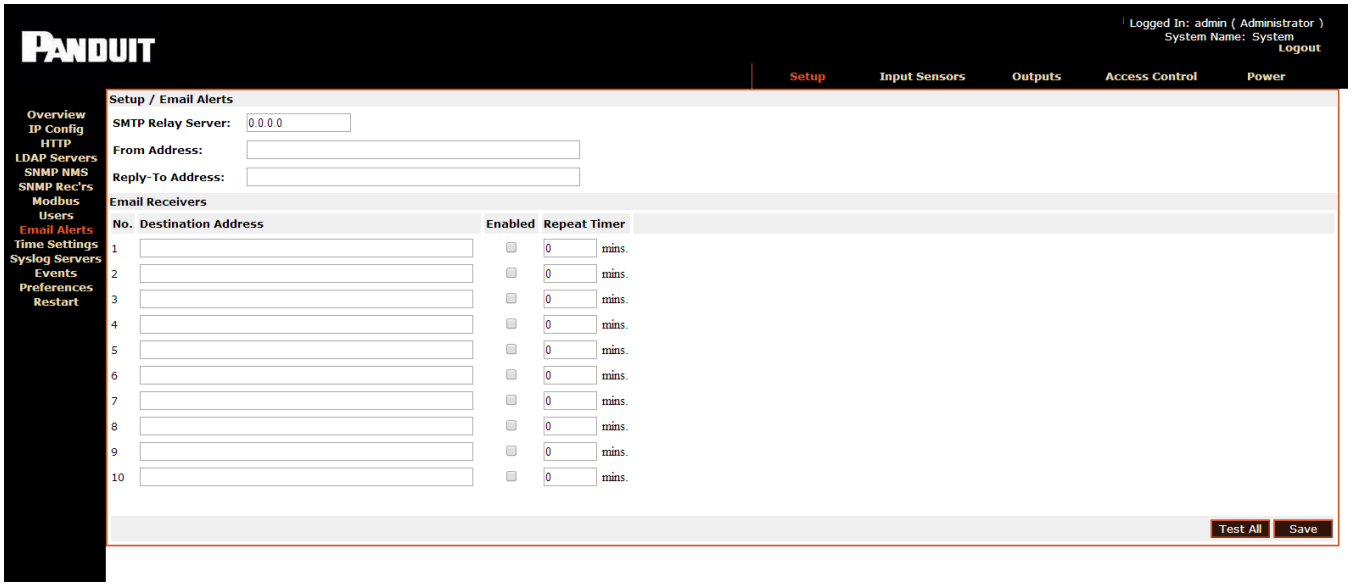
Three user levels are available for assignment.

- **Administrator** : Administrators have full control of SmartZone Gateway configuration settings.
- **Controller** : Controllers can view configuration settings.
- **Viewer** : Viewers can view configuration settings.

Warning: User 1 / admin is the master administrator. It is possible to remove administrator rights from the admin user. Doing this is not recommended as it may result in no one having administrator access. In this situation, a reset to factory defaults is the only solution. Details on how to do this can be found in the Troubleshooting section.

Setup - Email Alerts

On this page, you can edit email alert settings for traps. You may set up to 10 email receivers.

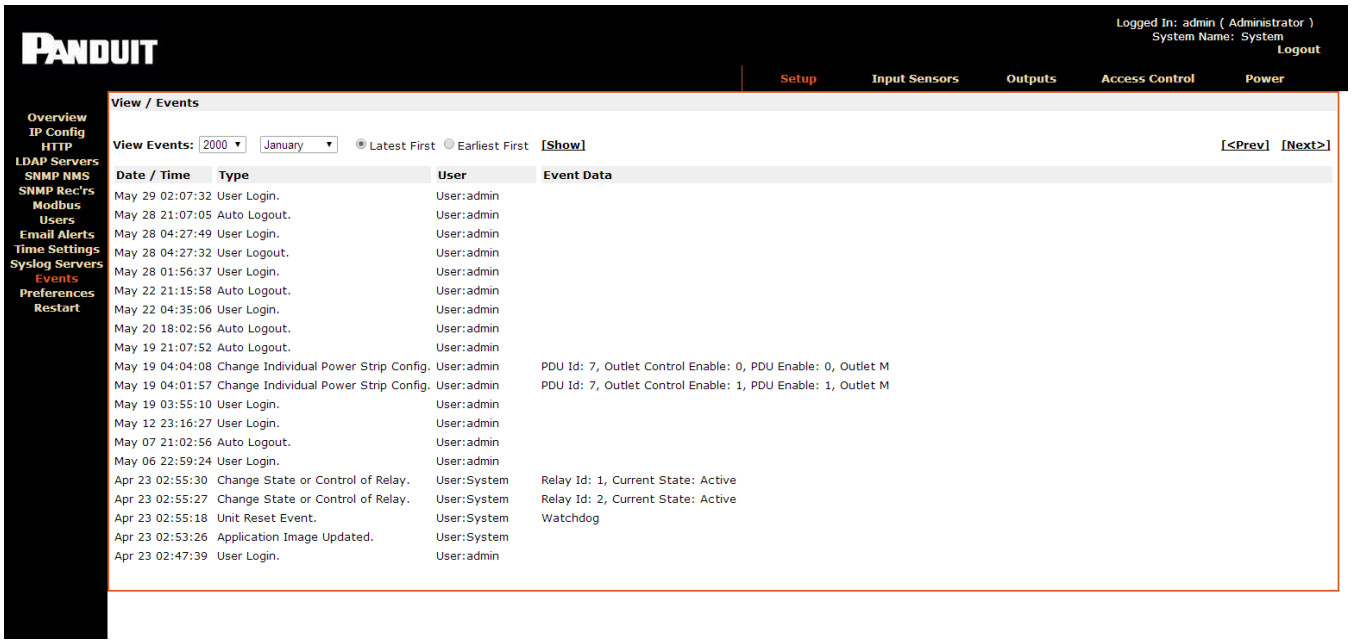


Email Alerts	
SMTP Relay Server	The IP Address of the SMTP Server
From Address	Address from which the alert emails are sent

Email Alerts	
Reply-To Address	Address to which the email receivers can reply
Destination Address	Address that will receive the email alerts
Enabled	Toggle the check box to enable or disable alerts to each address
Repeat Timer	Number of minutes after which the email alert will repeat

Setup - Events

The **Events** page shows a history of events that have occurred, along with specific details about each event.



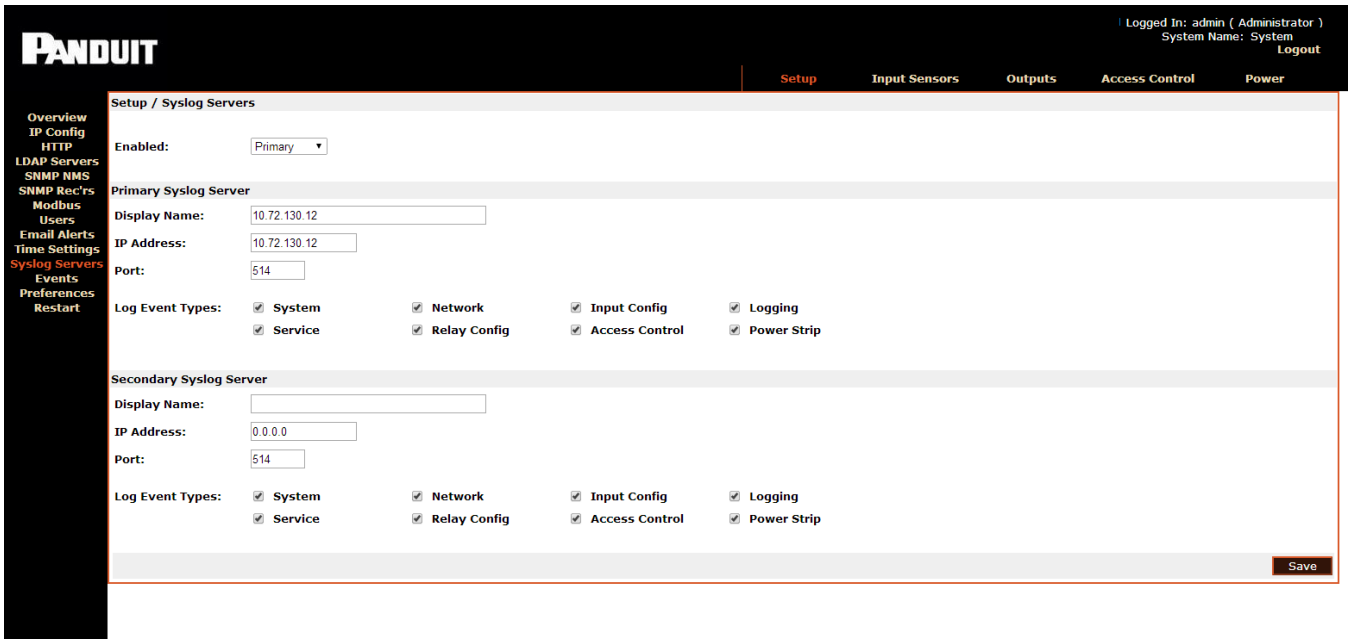
To specify a range of events to view, select the desired year and month from the drop-down menus, then click **Show**.

Date/Time, Type, User, and Event Data for each event are displayed.

Events can be ordered **Latest First** or **Earliest First** by clicking the corresponding radio button.

Setup - Syslog Servers

This page allows you to view or edit information about the Syslog Servers currently being used.

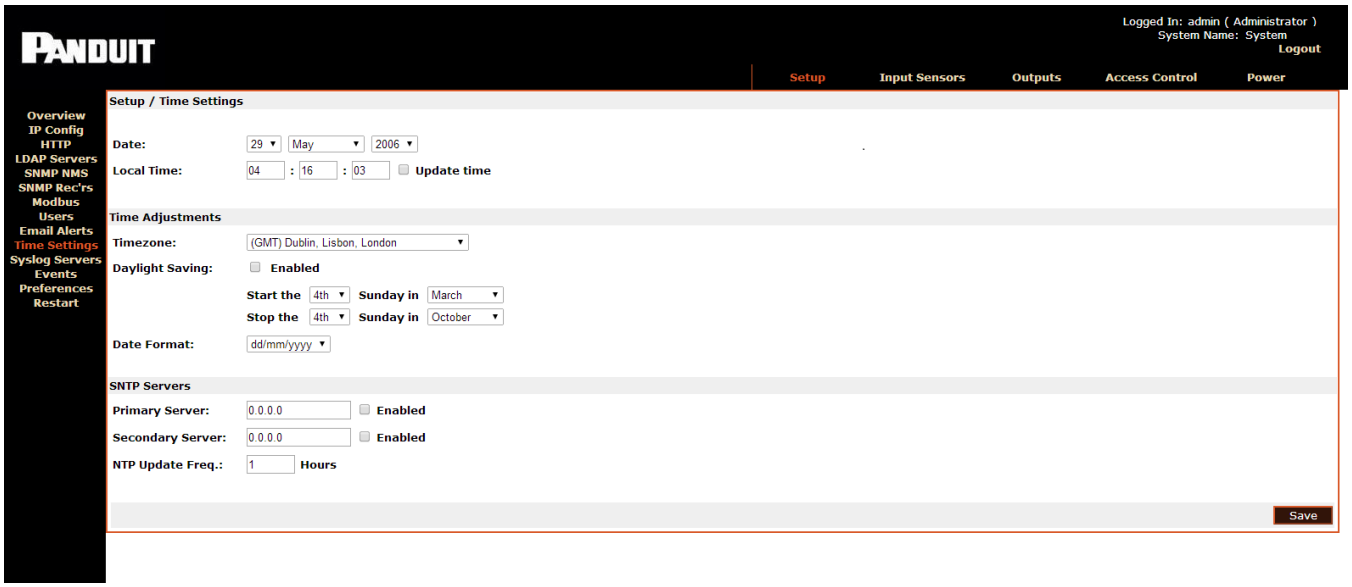


From the Enabled drop-down menu, you can choose which syslog servers are enabled. Fill in the following fields for each Syslog server.

Syslog Server Setup	
Display Name	The name of the Syslog server
IP Address	The IP address of the Syslog server
Port	The number of the port being used
Log Event Types	Click the check boxes to choose which events to log

Setup - Time Settings

The **Time Settings** page allows you to view or edit the current date and time.



Select the correct day, month, and year from the dropdown menus, and verify the local time. If you want to change the time, you must check the Update time checkbox.

Time Adjustments

Select the correct time zone from the drop-down menu.

- **Daylight Saving** can be enabled or disabled by clicking the check box. If Daylight Saving is enabled, select start/stop dates from the subsequent drop-down menus.
- **Date Format** allows the administrator to choose whether the date is displayed with the day or month first. For example, the date August 20, 2013 can be displayed in one of two ways:

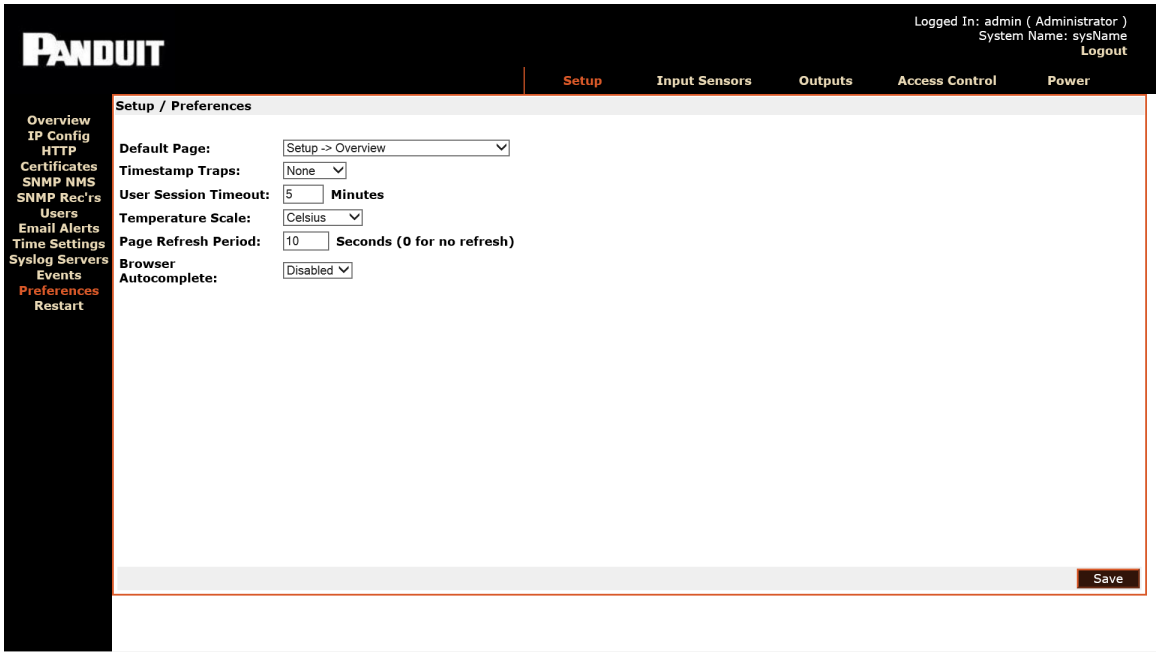
  20/08/2013 (DD / MM / YYYY)
  or
  08/20/2013 (MM / DD / YYYY)

Select the desired format from the dropdown menu.

- **SNTP Servers - Simple Network Time Protocol** synchronizes the clocks of computer systems over a network. Enter the IP address of an SNTP server, and specify (in hours) how often the time should be updated.

Setup - Preferences

The Preferences page allows you to edit system preferences.



Preferences	
Default Page	From the dropdown menu, select the first page you want to open when a user logs in. The preset default page is the Overview page.
Time stamp Traps	Choose from the dropdown menu where the timestamp will be found on traps. There are three options: • Prefix – timestamp at the beginning • Append – timestamp at the end • None – no timestamp
User Session Timeout	Enter a number of minutes, after which a session will be timed out if the user is inactive.
Temperature Scale	Select Celsius, Fahrenheit, or Kelvin from the drop-down menu.
Page Refresh Period	Enter a number of seconds, after which the page will automatically refresh. If 0 is entered, the page will not refresh automatically.

Preferences	
Browser Auto-complete	If this feature is **Enabled**, the browser assists with text field entry by presenting previously used values for user selection. If **Disabled**, no such values are presented.

Setup – Restart

A unit may be rebooted or reset to factory defaults here.

Restart Unit

Restart Now

Selecting **Restart Now** commands the unit to reboot. Rebooting the unit will cause any outstanding configuration changes to take effect.

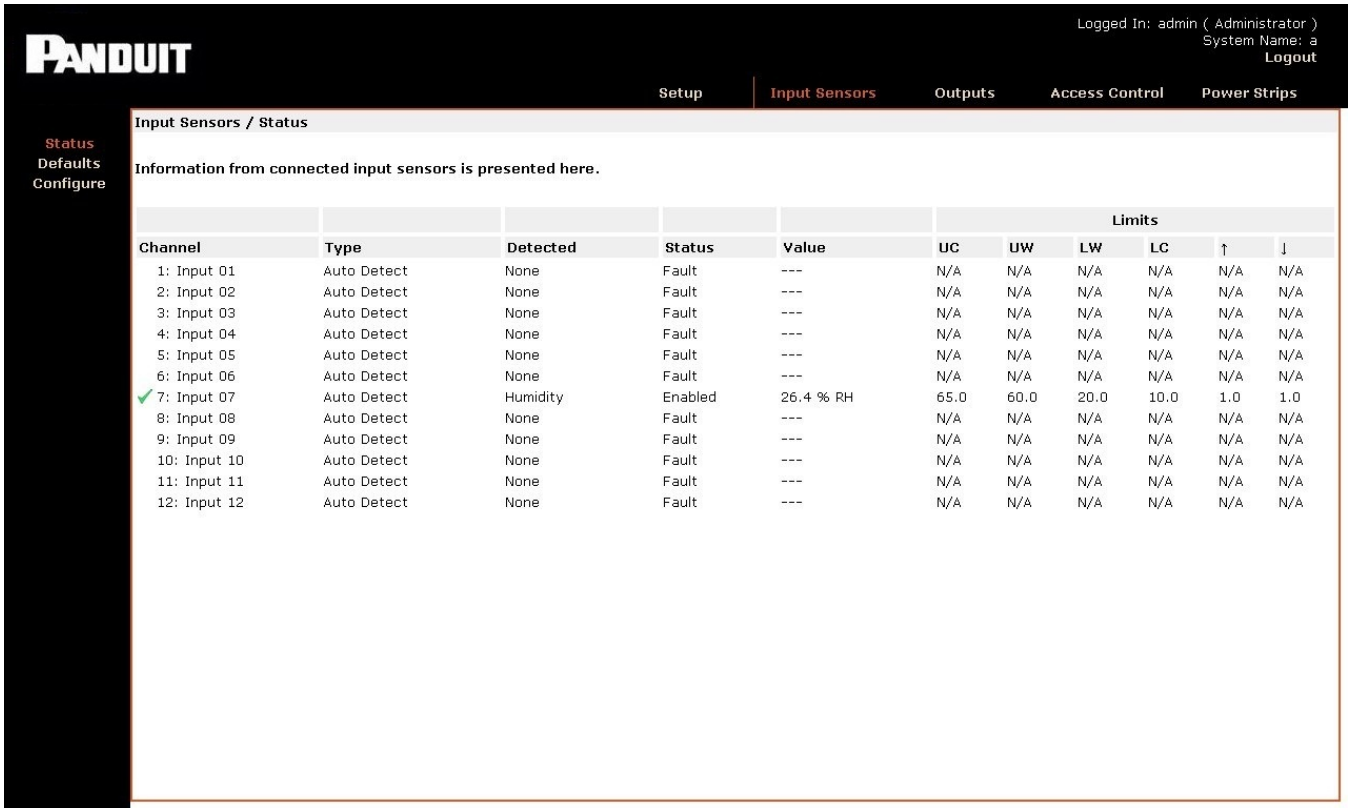
Reset to Factory Defaults

See Troubleshooting for instructions on resetting the factory default settings for the unit.

Input Sensors – Configuration and Status

Status

The Input Sensors status page presents an overview of the input ports. This page displays the input channel number, name, type of input sensor, status, current readings, and thresholds.



					Limits					
Channel	Type	Detected	Status	Value	UC	UW	LW	LC	↑	↓
1: Input 01	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
2: Input 02	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
3: Input 03	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
4: Input 04	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
5: Input 05	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
6: Input 06	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
✓ 7: Input 07	Auto Detect	Humidity	Enabled	26.4 % RH	65.0	60.0	20.0	10.0	1.0	1.0
8: Input 08	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
9: Input 09	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
10: Input 10	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
11: Input 11	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A
12: Input 12	Auto Detect	None	Fault	---	N/A	N/A	N/A	N/A	N/A	N/A

Status Indicators

Three status indicators are displayed next to input channels to allow quick determination of normal, warning, and critical alarm statuses:

✓	Channel reading currently within threshold limits.
⚠	Upper or lower Warning limit reached or exceeded.
⊗	Upper or lower Critical limit reached or exceeded.

Input Sensors – Defaults

The Input Sensor Defaults menu allows configuration parameters for input sensors of specific types to be defined and applied to all inputs of that type.

The types of input sensors are:

- Temperature
- Humidity
- Analog (Voltage)
- Open/Close Contacts (digital inputs)

The configurable defaults are described below.

Calibration Offset

The value entered here alters the actual reading of a sensor by the amount specified.

For example, if a Calibration offset of 6 was used and a sensor's true reading was 36, the indicated reading used for display and alarm purposes would be 42. This works the same way for both temperature and humidity sensors.

Hysteresis Value

The hysteresis default value to be applied to sensors is specified here. The value specified is an offset from a sensor's threshold values.

For example, a hysteresis value of 5 would mean that, in the case of an Upper Control Limits alarm, the alarm value would have to reduce to 5 below the threshold value before another alarm is issued.

Please see Appendix B: Hysteresis Demystified for detailed information.

Limits and Traps

You can set default values for sensor alarm thresholds here. You also can set the default settings for alarm threshold traps here.

The following thresholds can be set:

- Upper Control Limit
- Upper Warning Limit
- Lower Control Limit
- Lower Warning Limit

You can apply default trap settings for all of these thresholds. With the trap box deselected, no SNMP alarm traps will be generated, even when an alarm condition exists for that threshold.

Repeat Timer

The repeat timer causes alarm traps to be reissued after a specified amount of time if the alarm condition persists.

Setting the repeat timer to zero will disable the repeat traps.

The defaults that can be set for Open/Close contacts differ from the Temperature and Humidity settings.

Normal State

Normal state specifies the condition in which a contact is considered to be in a Normal, Non-alarmed state.

Devices such as smoke alarms and air conditioning units often have normally open contacts. To receive alarm indications from these types of units would cause alarms to be issued when a monitored contact closes.

Setting normally closed in the case of a rack or cabinet door would cause an alarm condition when the door was opened.

Trigger Type

The trigger type defaults for Open/Close sensors are specified here.

The three available options for trigger types are:

Level

Level triggering is the default mode. When an input physically transitions from a Normal to Non-Normal state, an alarm is triggered. However, the alarm persists only while the

input remains in a Non-Normal state. When the input returns to a normal state, the alarm is cleared.

Normal to Non-Normal (Positive Edge)

This type of triggering may be used in situations where a momentary type input (for example, a shock sensor or PIR) is used. Since these types of inputs are momentary, any alarm condition that occurs will persist until manually cleared.

Positive Edge triggering is used when an alarm is required to persist after an input changes from the Normal state to the Non-Normal state.

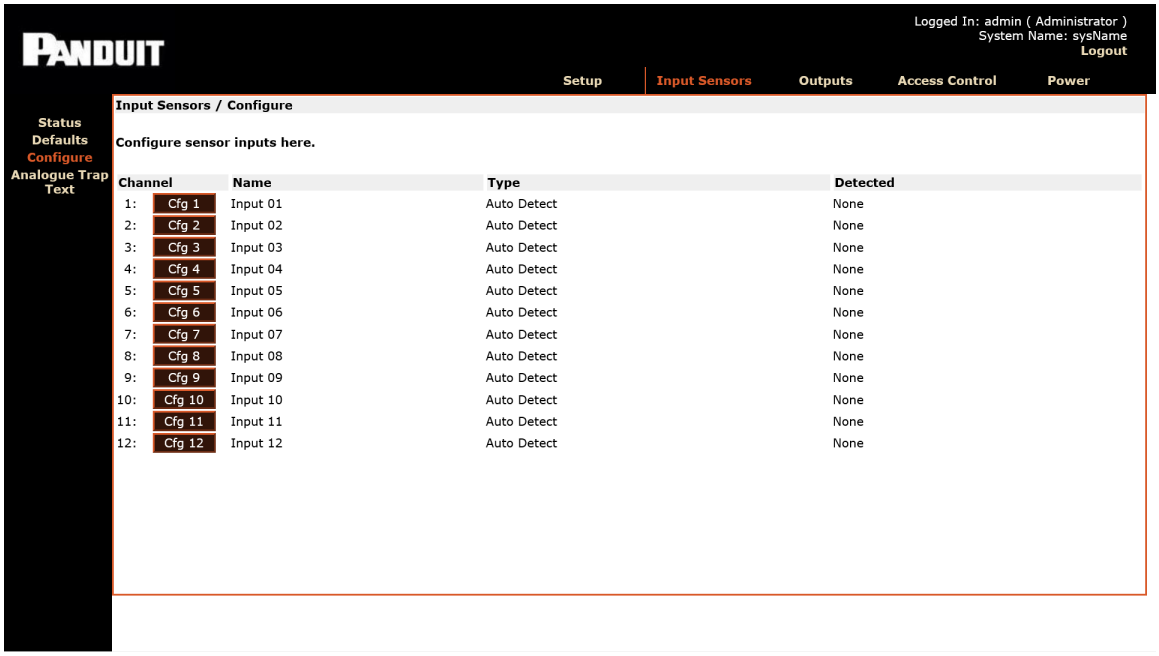
Non-Normal to Normal (Negative Edge)

This type of triggering may be used in situations where a momentary type input (for example, a shock sensor or PIR) is used. Since these types of inputs are momentary, any alarm condition that occurs will persist until manually cleared.

Negative Edge triggering is used when an alarm is required to persist after an input changes from the Non-Normal to the Normal state.

Input Sensors - Configure

You can configure the individual sensor channels in this window.



Select the **Config** option to open a detailed configuration page for the selected sensor.

The difference between the menus presented here and the menus presented on the Defaults page is that settings are applied to individual channels.

The submenus contain all the options in the Defaults menu, plus two additional options:

Name

Sensor channels can be assigned names for ease of identification (for example, “Server Room Sensor” or “UPS Battery Fail”).

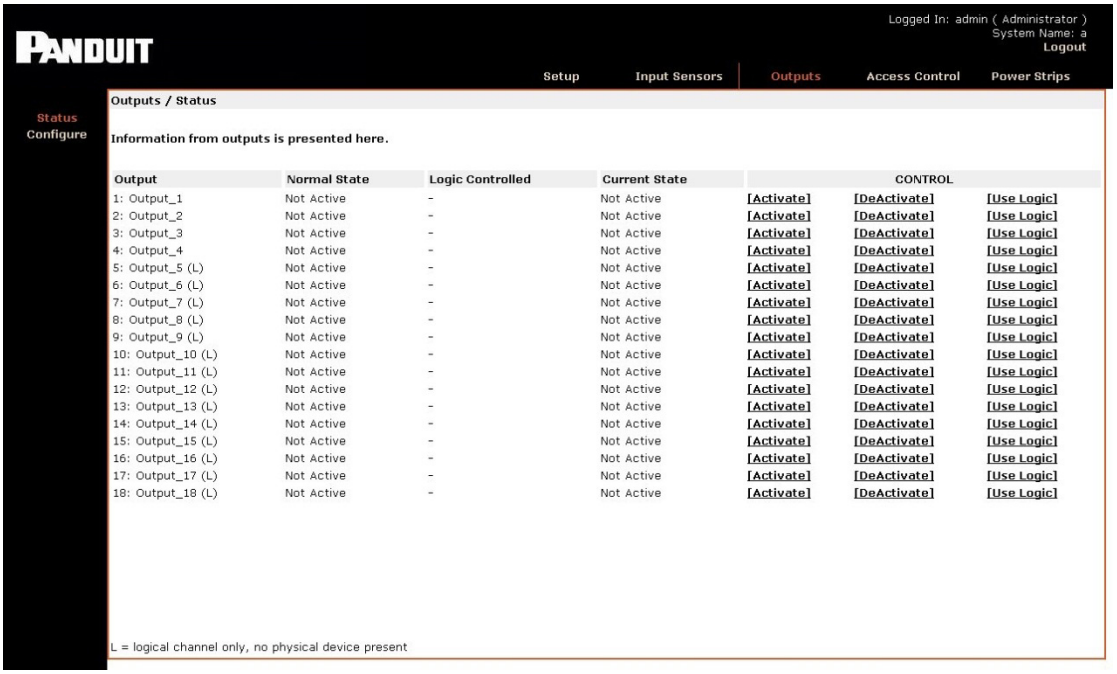
Type

The type of connected sensor is specified here. The sensor channels can be set to auto detect, temperature, humidity, contact, or disabled.

Note: Occasionally, clear traps will be sent to the NMS trap receivers while a sensor is being connected to a device. This is considered normal behavior, because some voltage surges may be produced when input sensors are physically connected to the gateway. In normal operation, the sensors will always be connected to the device and the sensor voltages will stay within normal expected values

Outputs – Status

The Outputs Status page provides an overview and direct control of the EPA126 unit's four output relays.

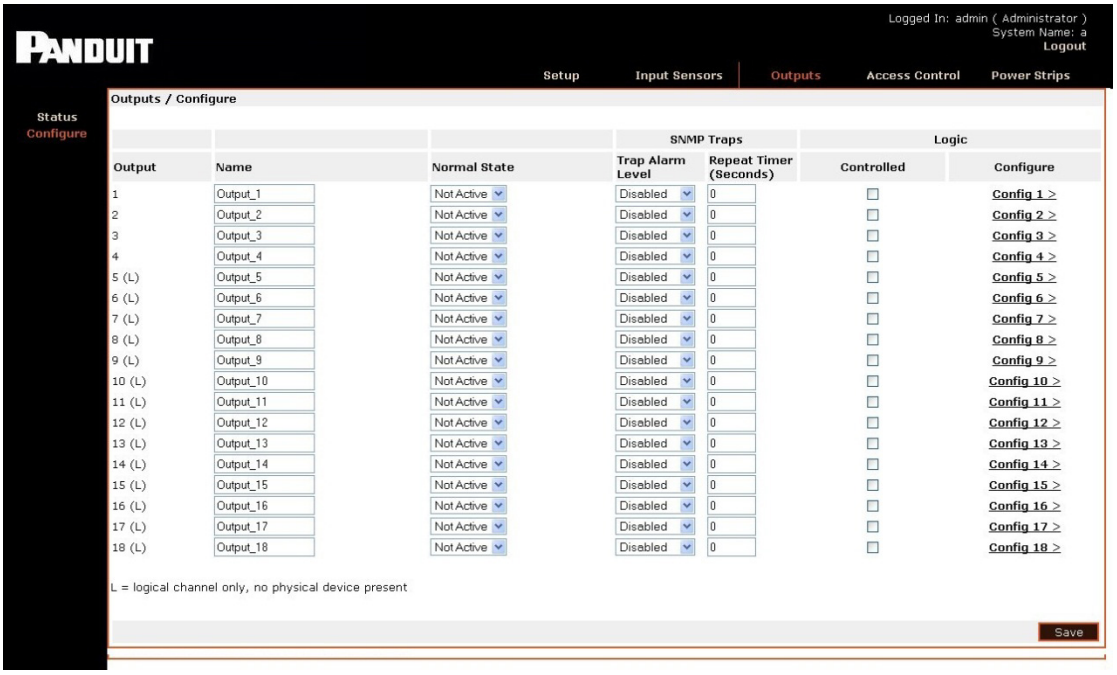


Control

- **Activate**: Commands the selected relay to energize.
- **Deactivate**: Commands the selected relay to de-energize.
- **Use Logic**: Commands the selected relay to enter logic-controlled mode. In logic-controlled mode, the activation and deactivation is governed by any configured and enabled logic.

Outputs – Configure

Relay and logic configuration is performed via two pages.



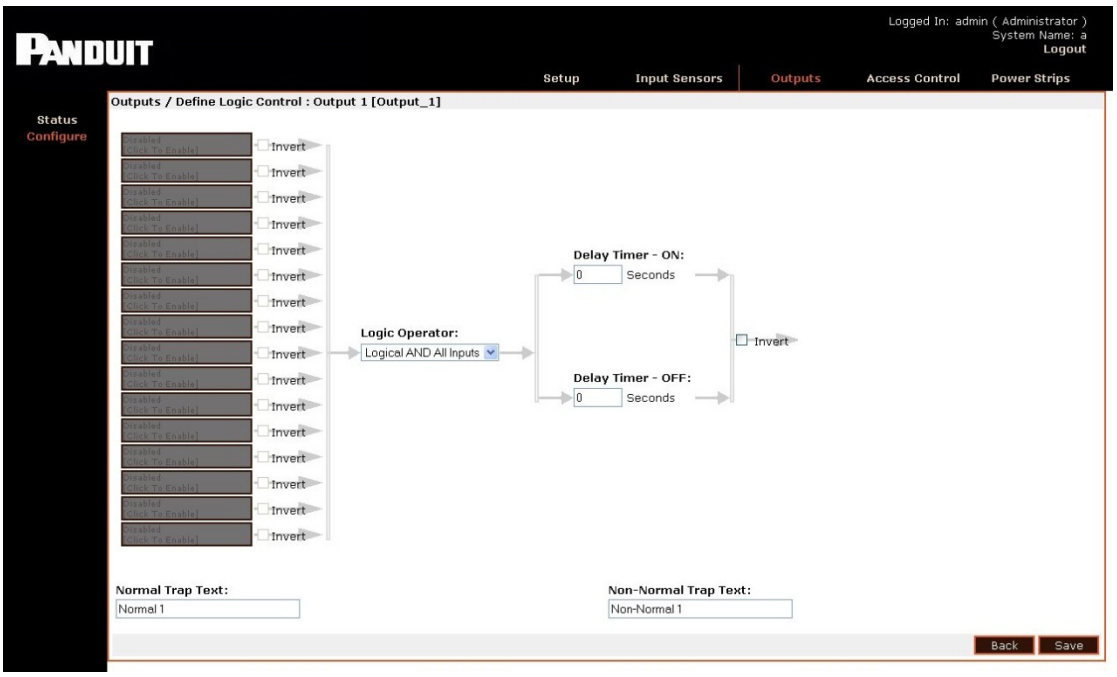
- **Name**: The relay output name is specified here. (for example, Fan_Tray or Door_1).
- **Normal State**: Normal State specifies the ‘normal’ or ‘non-alarm’ state of a relay.
  - **Not Active**: Specifies that a output relay in a ‘Not Active’ (‘not-energized) state is normal.
  - **Active**: Specifies that an output relay in an ‘Active’ (‘Energized) state is normal.
- **Trap Alarm Enabled**: Toggles alarm trap generation. An alarm trap will be generated when the relay is in an alarm state with this enabled.
- **Repeat Timer (Seconds)**: Specifies an interval in which a trap for an *existing* alarm condition will be regenerated. This will be a duplicate of the original trap. A repeat timer is not necessary in NMS systems employing intelligent trap handling. Setting zero (0) disables repeat traps.
- **Controlled**: This toggle acts as a master control to any logic configured for a relay. When selected **Use Logic** may be enabled on the Status page.

  It is only possible to select this option if logic has been specified in the **Relay Specific Configuration** page.

- **Configure**: Click on the **Config** link for the desired output to open the Outputs - Configure - Config window.

Outputs - Configure - Config

Actual Digital Output Relay logic configurations are specified here.



Input Selection

Select Inputs into the logic on the left-hand side by clicking one of the **Click to Enable** boxes.
Here you can choose a sensor type, sub-type, and name to feed into logic.

Invert

The Invert check box allows the logic inversion of an input into the logic.
For example, when an upper warning limit is breached, the following input logic is used.

	No Invert	Invert
Threshold breached	1 (Logic Triggering)	0 (Not Logic Triggering)
Threshold within limit	0 (Not Logic Triggering)	1 (Logic Triggering)

Logic Operator

The Logic Operator provides options that control the evaluation of inputs to logic.

Logical AND Inputs

Logical AND requires **ALL** of the selected inputs to the logic to be in a triggering state to activate the relay logic.

Logical OR Inputs

Logical OR requires only ONE of the selected inputs to be in a triggering state to activate the relay logic.

Delay Timer On

Delay Timer On specifies the time in seconds that must elapse before the logic activates in a situation where it would otherwise activate immediately.

This is useful in a situation where you want a delay to be added before a logic controlled relay is switched on.
If the logic triggering condition clears before the specified time has elapsed then the logic will not activate at all.

Delay Timer Off

Delay Timer Off specifies the time in seconds which must elapse before the logic deactivates in a situation where it would otherwise deactivate immediately.

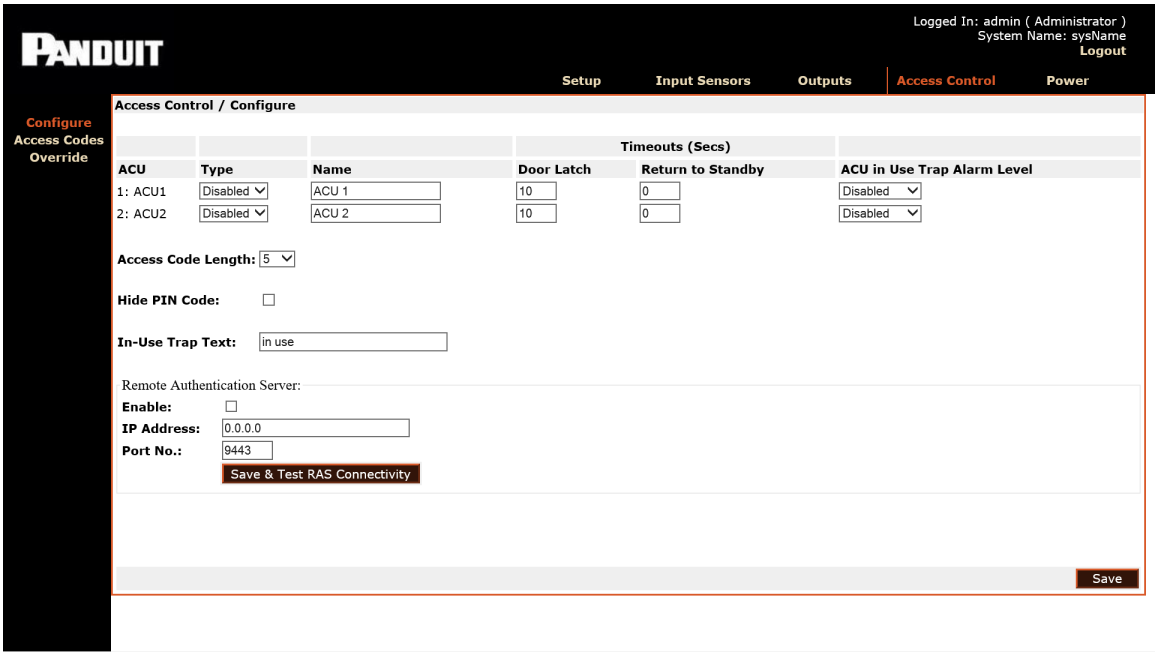
This is useful in a situation where you want a delay to be added before a logic controlled relay is switched off from a current on state. If the logic triggering condition returns before the specified time has elapsed then the logic will not deactivate at all.

Final Invert

A final invert check box is provided. This allows the final output logical state to the relay to be inverted.
Any conditions that produce a relay on output will produce the reverse.

Access Control – Configure

Configure keypad devices physically attached to the unit at this screen.



ACU

ACU KP1 and KP2 refer to the two physical keypad connection ports found on the rear of the EPA126 unit.

Type

Two types of supplied keypads are supported by the EPA126 unit: 2x5 and 3x4.

Name

A keypad name can be specified here for alarm logging and notification reasons. Front_ Door or Rear_Door are common choices.

Timeouts - Door Latch

Since the most common use of the keypad is to activate a solenoid to provide rack access, a door latch timer is provided. The time in seconds specified here controls how long a valid keypad entry will provide a positive input to relay logic. In most situations,

this controls how long a door solenoid remains activated after a valid keypad code is entered.

Timeouts – Return to Standby

This parameter specifies the time in seconds that must elapse before the keypad returns to standby after an incomplete code is entered.

ACU In Use Trap

Selecting this option causes a keypad-in-use trap to be produced when any button is pressed on the keypad. This trap will be produced regardless of the entered code's validity.

Access Code Length

An Access Code Length of between 1 and 15 digits can selected here. This Access Code Length applies to all pin codes defined on the Access Control – Pin Codes screen. Any pin codes that do not match the length specified here will be unusable.

Hide PIN Code

This setting causes the Access Code to be obscured from the user. Note that once this option is selected, Access Codes cannot be read from any interface, and disabling this feature will cause all Access Codes stored on the Gateway to be deleted.

In Use Trap Text

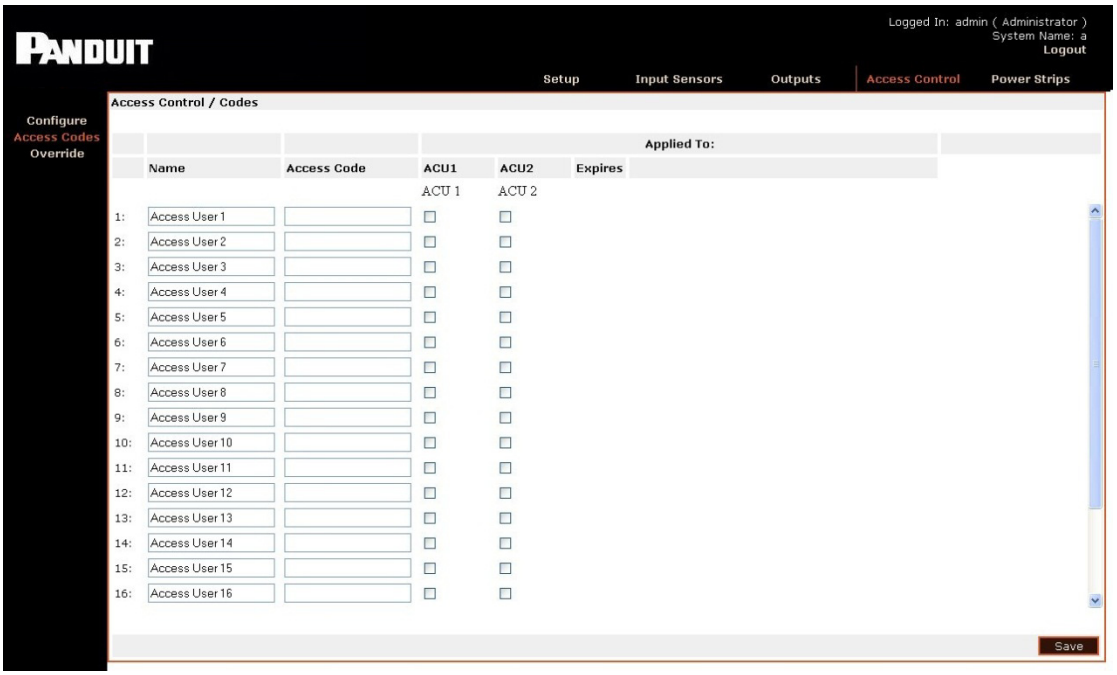
Configures the text to be carried on the ACU In Use trap.

Remote Authentication Server

Identifies the server to be used to authenticate ACU requests.

Access Control – Codes

Access Codes are specified and applied to one or both keypads here.



Name

A user or group name can be specified here for association with an Access Code.

Access Code

Pin codes can be entered here. Pin code length can range from 1 to 15 digits.

Regardless of PIN length used here, only Pin codes of the length specified by the **Pin Code Length** setting on the Access Control – Configure page will be usable.

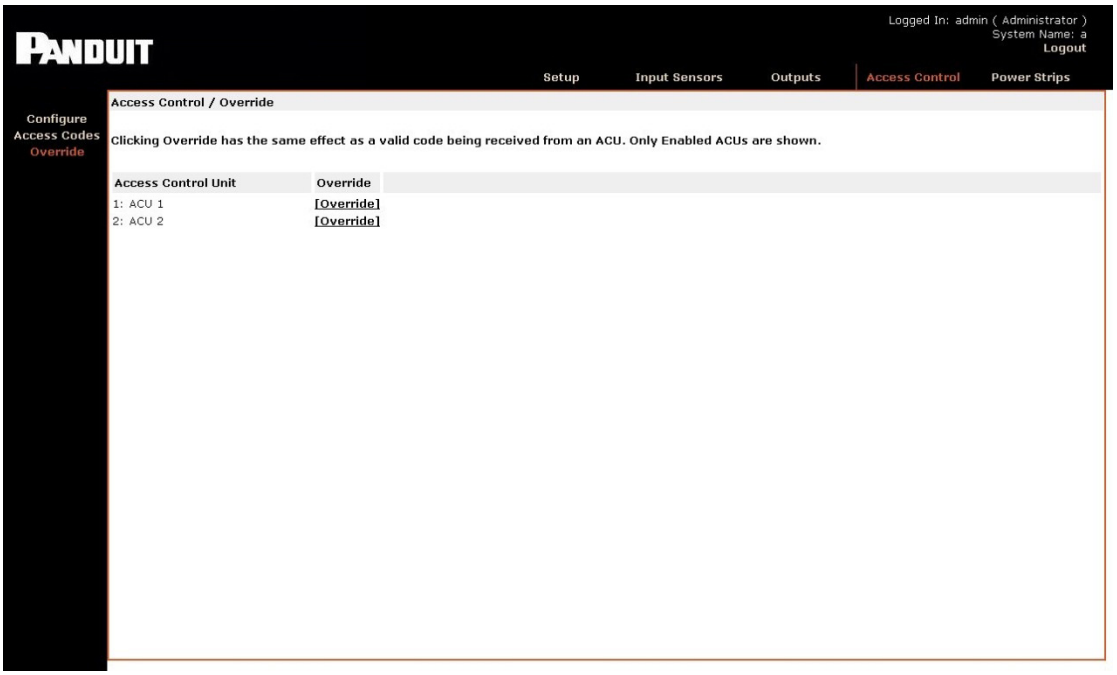
Applied To

The check boxes allow PIN codes to be associated with a given keypad or both.

A PIN Code line must have a check box selected for a given keypad if the code is to be considered valid for that pad.

Access Control – Override

This page allows a valid entry to be sent to a keypad remotely. This function is useful in a situation where it may be necessary to grant access to a rack remotely.

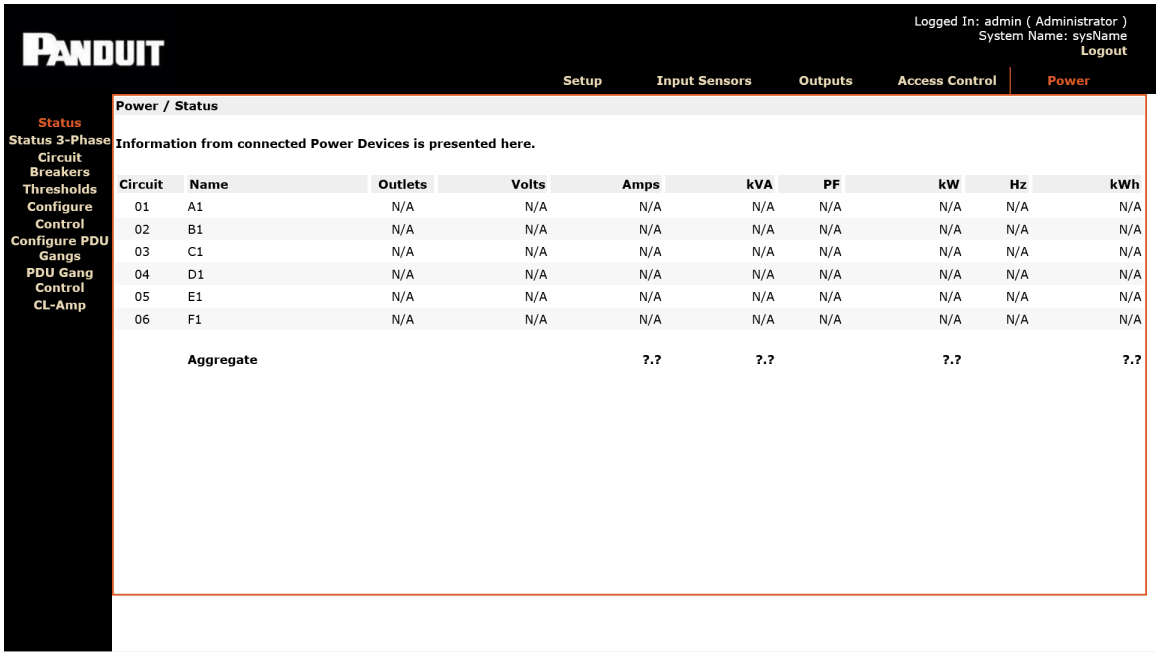


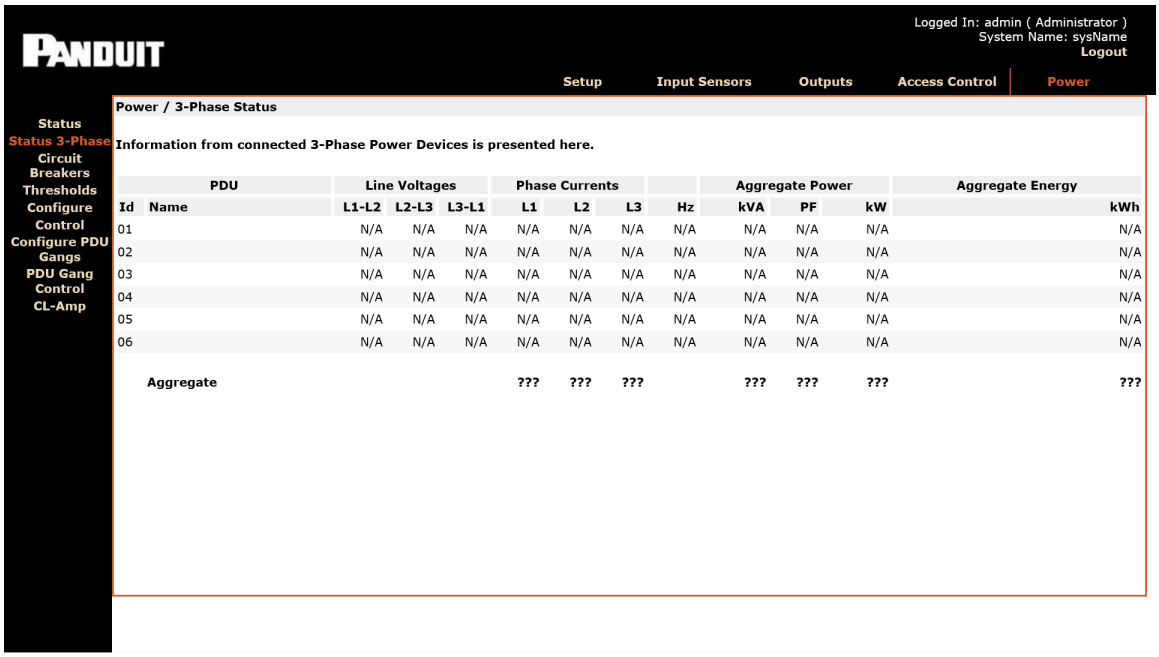
The Override buttons for each enabled keypad direct a ‘valid PIN Code’ command without the need to enter one physically at the keypad.

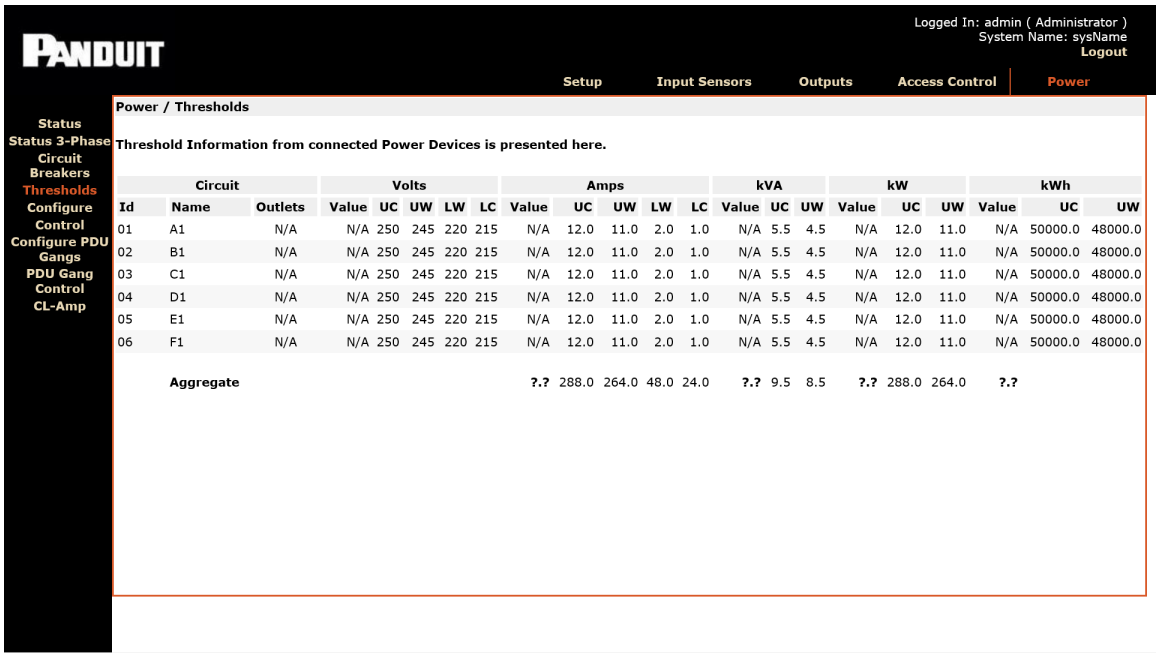
Power – Configuration and Status

Power - Status, Status 3-Phase, and Thresholds

The Power -Status, Status 3-Phase, and Thresholds pages present an overview of connected SmartZone Rack PDUs. The page displays the PDU channel number, name, voltage, and current thresholds.







NOTE: When the SmartZone™ Gateway EPAX18 expansion unit is connected to the EPA126, the 24 PDUs are displayed across four screens, each displaying six PDUs. See EPAX18 Expansion Unit for details.

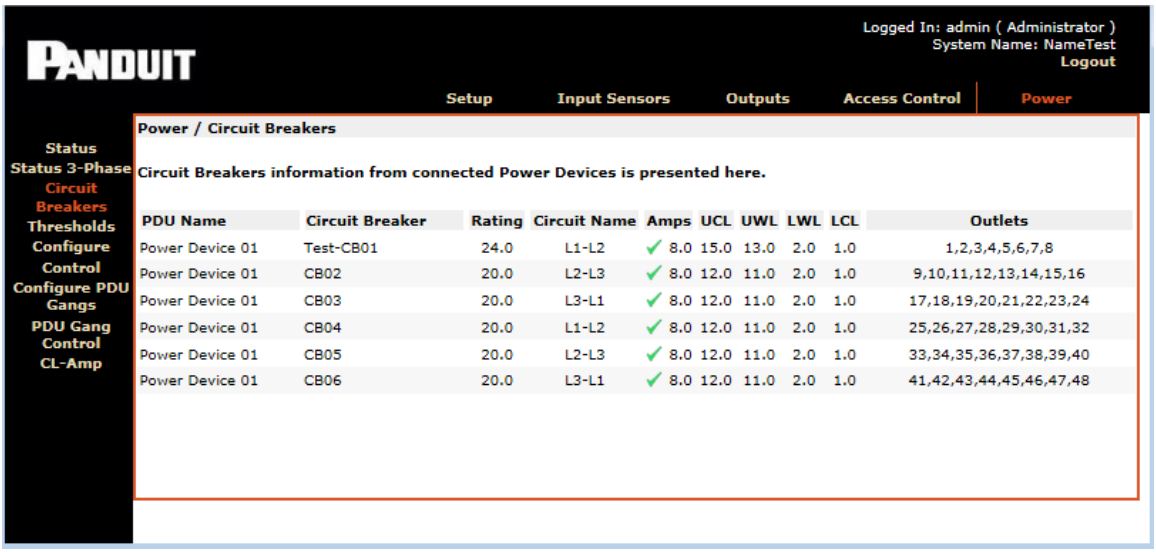
Status Indicators

Three status indicators are displayed next to PDU channels to allow quick determination of normal, warning, and critical alarm statuses:

✓	Channel reading currently within threshold limits.
⚠	Upper or lower Warning limit reached or exceeded.
⊗	Upper or lower Critical limit reached or exceeded.

Power - Circuit Breakers

The ‘Power – Circuit Breakers page presents an overview of the status information about the circuit breakers and branch circuits within a PDU.



PDU Name:

Displays the name of the PDU for which the circuit breaker and branch circuit information is being displayed.

Circuit Breaker:

Displays the name of the circuit breaker for which information is being displayed.

Rating:

Displays the current rating of the circuit breaker in amps.

Circuit Name:

Displays the name describing the phases that are associated with the circuit breaker.

Amps:

Displays the total current being measured through the circuit breaker in amps.

UCL, UWL, LWL, LCL:

Displays the alarm thresholds for the circuit breaker. Upper control, upper warning, lower warning, and lower control, in amps.

Outlets:

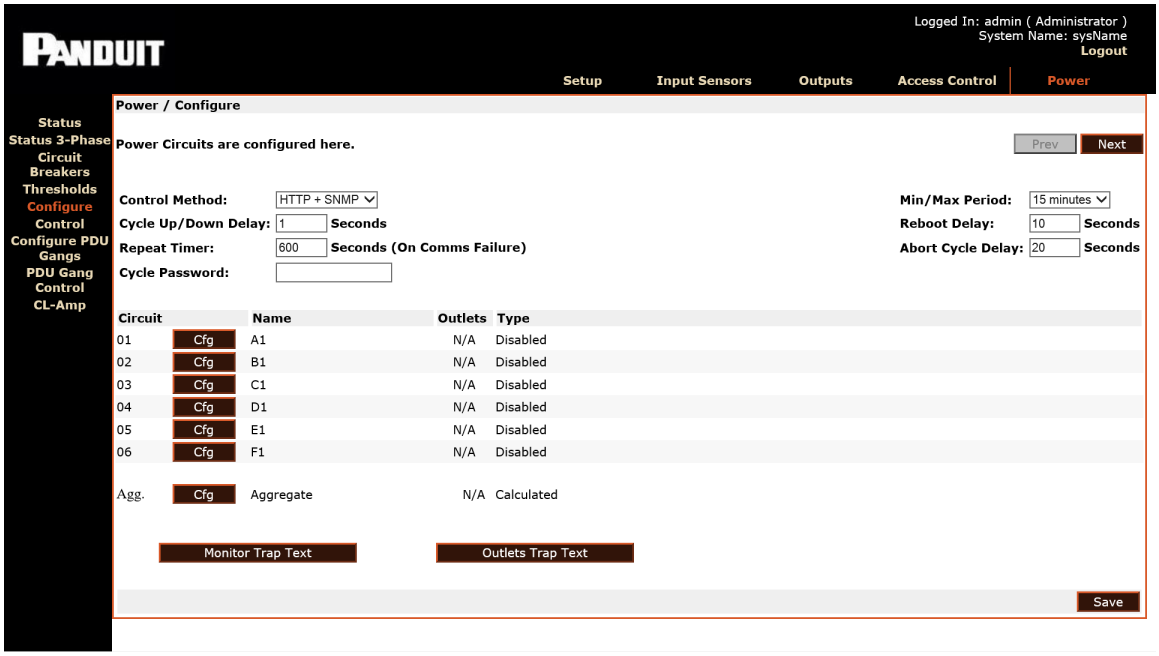
Displays the PDU outlets that are protected by the circuit breaker as a comma-separated list.

Note: Status indicators are as described elsewhere.

Power Strips - Configure

The Power Strips - Configure menu provides the ability to configure individual PDU options. You can configure the two PDU channels individually by selecting the **Config** option next to each channel.

A summary of several current configuration parameters is displayed on a per-PDU channel basis.



Control Method

The Control Method parameter specifies which control methods are available to control the outlets on PDUs attached to the unit.

HTTP + SNMP

The Web Management Interface and SNMP can be used to command PDU outlets.

HTTP Only

This option allows only the Web Management Interface to command PDU outlets. This effectively disables SNMP PDU outlet control.

SNMP Only

This option allows only SNMP to command PDU outlets.
This effectively disables the Web Management Interface PDU outlet control.

RS232 Only

This option allows PDU control commands to be issued directly to a unit via the onboard RS232 port. This option disables the Web Management Interface and SNMP control.

Cycle Up/Down Delay

This parameter specifies the interval in seconds between switching on and switching off outlets when an entire PDU strip is cycled (all outlets commanded on or off).

Repeat Timer (on Comms Failure)

This parameter specifies the interval in seconds between when an initial PDU comms failure trap is produced and a repeat trap is issued.

Reboot Delay

This parameter specifies how long (in seconds) an outlet remains off after a reboot before switching back on.

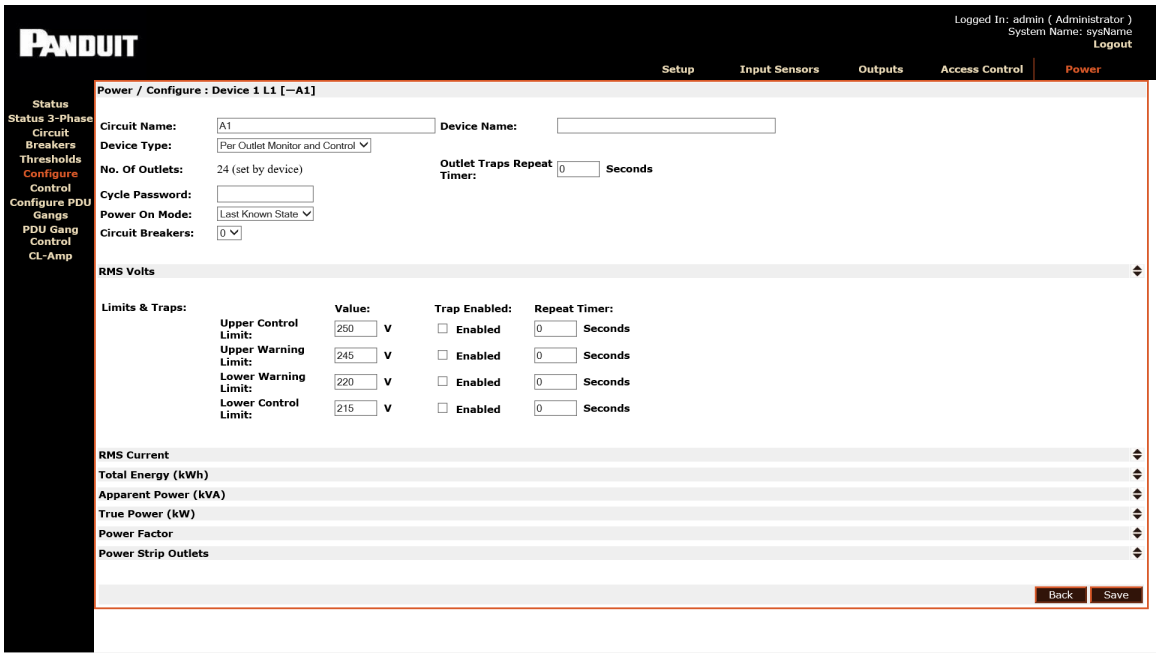
Abort Cycle Delay

This parameter specifies how many seconds must elapse before a commanded cycle begins on a PDU. This delay gives the user time to reverse the decision to cycle a PDU before any outlet states are changed.

If you do not want to use this functionality, set the delay to zero.

Power – Configure Menu

This menu allows all the available options for a specific PDU to be specified.



Circuit Name

Individual PDUs can be assigned names for ease of identification (for example, “Rack 5 PDU Sensor” or “Comm Room”).

Device Type

Specify the type of PDU connected to a channel here. This setting takes precedence if it is set to a simpler PDU model than is actually connected. Otherwise, the parameters reported by the PDU will be used.

Disabled

No monitoring or control will be performed on this PDU channel.

Monitor Only

The monitoring of power values will be performed on this PDU channel.

Monitor and Control

Both outlet control and power monitoring will be enabled on this PDU channel.

Per Outlet Monitor

This option enables PDU-level monitoring and monitoring of each individual PDU outlet.

Per Outlet Monitor and Control

This option enables PDU-level monitoring and monitoring of each individual PDU outlet, plus outlet control.

Number of Outlets
This parameter specifies the number of controllable outlets present on a PDU. This is required when the **Control Only** or **Monitor and Control** options have been selected.

For example, if you have a PDU consisting of 24 Outlets, one of which is a permanent live (non-switching) outlet, 23 outlets would be specified.

Warning: Failure to specify the correct number of outlets can lead to the incorrect outlet being switched on or off.

During unit setup and deployment, you should select the **Control Only** or **Monitor and Control** options before critical loads are connected to outlets.

Cycle Password
This field specifies the password required to set a power cycle of outlets on a controllable strip. This password is used when switching outlets using SNMP, not when switching via the web interface.

Power on Mode
In the event that power to the PDU is lost, this parameter specifies how the outlets will be switched back on once power is restored.

RMS Volts

Limits and Traps
You can specify values for voltage, current, and total power thresholds here. You also can enable or disable traps for each threshold.

The following thresholds can be set:

- Upper Control Limit
- Upper Warning Limit
- Lower Warning Limit
- Lower Control Limit

Note: There are no lower limits for total power, because total power consumption can only go up, not down.

Repeat Timer

In the event of a communications failure with a connected PDU, this entry specifies how often (in seconds) Comm Fail traps will be generated.

RMS Current

(See options for RMS Volts above)

Total Power

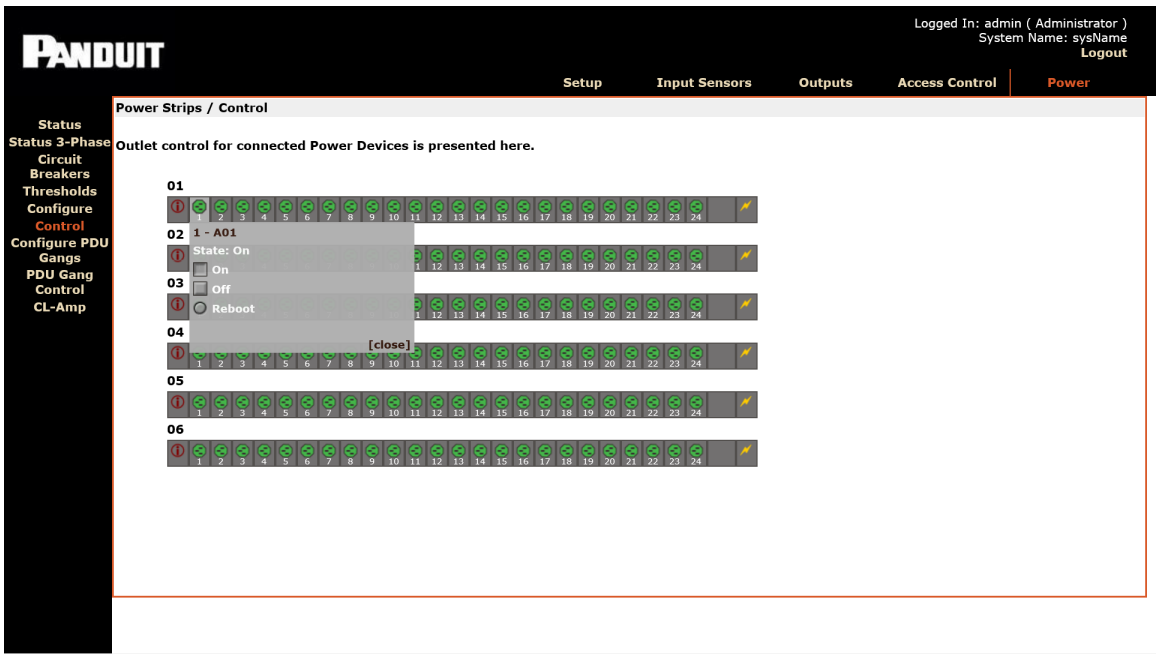
(See options for RMS Volts above)

PDU Outlets

(See options for RMS Volts above)

Power Strips – Control

Individual outlets or all outlets on a given PDU can be switched on and off using this screen.



The display consists of a visual representation of PDUs that have **Control** or **Monitor and Control** enabled on the Configure page.

PDUs that are **Disabled** or in **Monitor Only** status do not display any outlet graphics and are displayed with appropriate text.

PDU inputs are numbered 1 to 2 in ascending order. PDU numbers correspond to the physical input ports on the rear of the SmartZone Gateway unit.

Switching Individual Sockets

When you click on a socket, a control menu above the socket displays further information. Three control options are also presented:

On
Selecting this option commands the selected outlet to switch On. If the outlet is already on this will have no effect.

Off
Selecting this option commands the selected outlet to switch Off.
If the outlet is already off this will have no effect.

Reboot
The reboot option commands the selected outlet to switch off. After the time specified by the Reboot Delay timer has elapsed, the outlet will automatically switch itself back On.

Switching an Entire Strip

You can switch all the outlets on any strip Off or On with a single command by clicking the **Lightning Bolt** symbol on the end of a PDU graphic.

A small dialog displays, offering the following options:

On
This option commands all outlets on a selected PDU to switch on. Any outlets already on will remain on; any currently off will be switched on.

Off
This option commands all outlets on a selected PDU to switch off. Any outlets already off will remain off; any currently on will be switched off.

Abort!
Once a command has been issued to turn all outlets on a PDU on or off, you can click the **Abort!** button to abort the command.

The Abort Cycle delay option on the PDUs – Configure – Config menu specifies the time allowed in seconds for an abort to be issued.

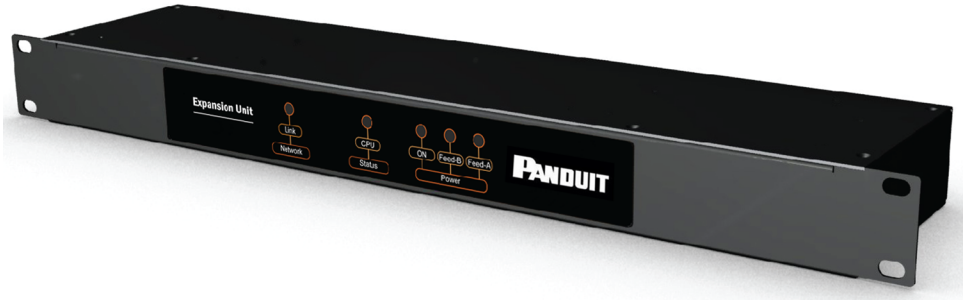
EPAX18 Expansion Unit

The SmartZone™ Gateway EPAX18 is an expansion unit that connects directly to an EPA126 to expand its monitoring capabilities from 6 to a total of 24 power devices. When combined with an EPA126, this expansion unit allows up to 12 dual-fed cabinets to be fully monitored from the EPA126's IP address.
The EPAX18 supports up to 18 power distribution units or power monitoring devices, including the following:

- Single-Phase PDUs/Clamp Meters
- 3-Phase PDUs (Monitored)
- Single-Phase Monitored per Outlet PDUs
- Single-Phase Switched per Outlet PDUs

Front of Gateway EPAX18

The following image shows the front panel of the EPAX18 unit:



LEDs

Network

- **Link** (green): Embedded in the RJ-45 connection. Illuminates when the Ethernet link is established. Flashes with network activity.

Status

- **CPU**: Indicates system activity.

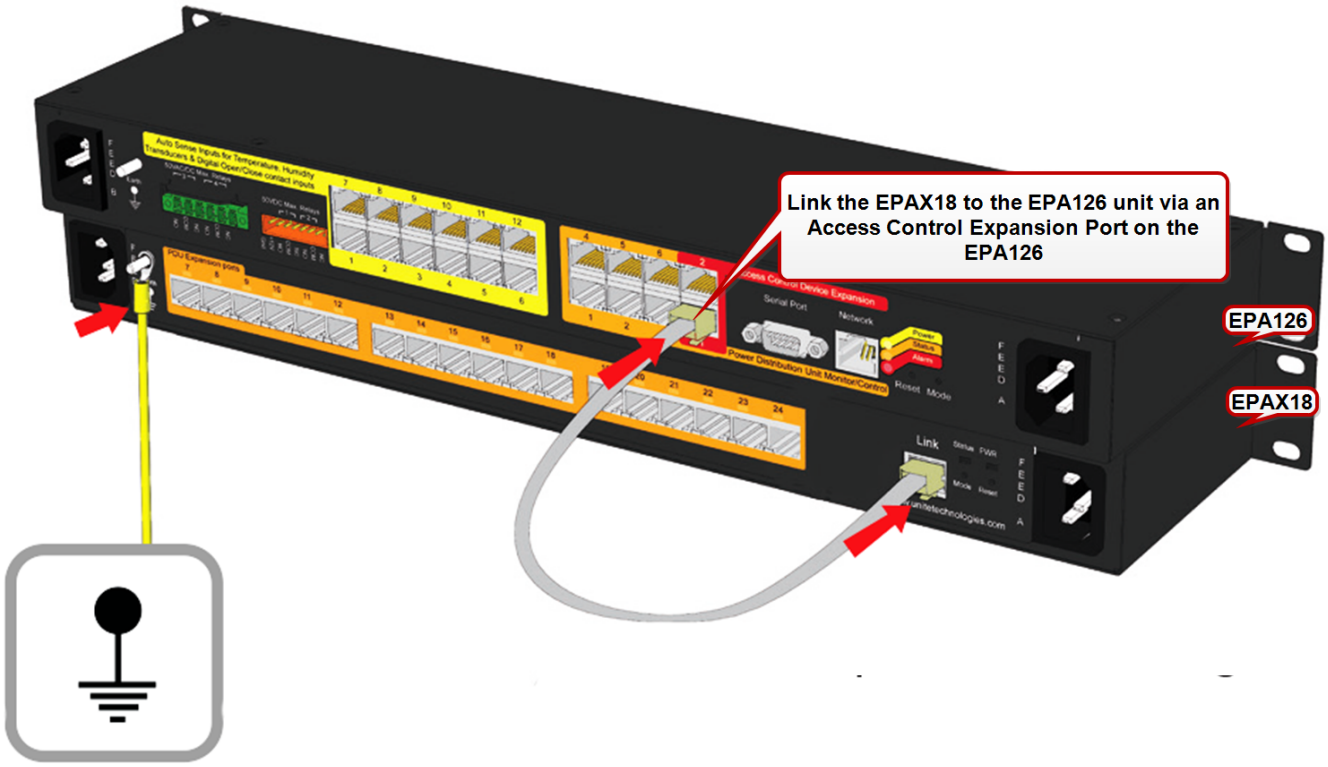
Power

- **On**: Illuminates when unit is powered.
- **Feed A** (amber): Illuminates when main present to input Feed A.
- **Feed B** (amber): Illuminates when main present to input Feed B.

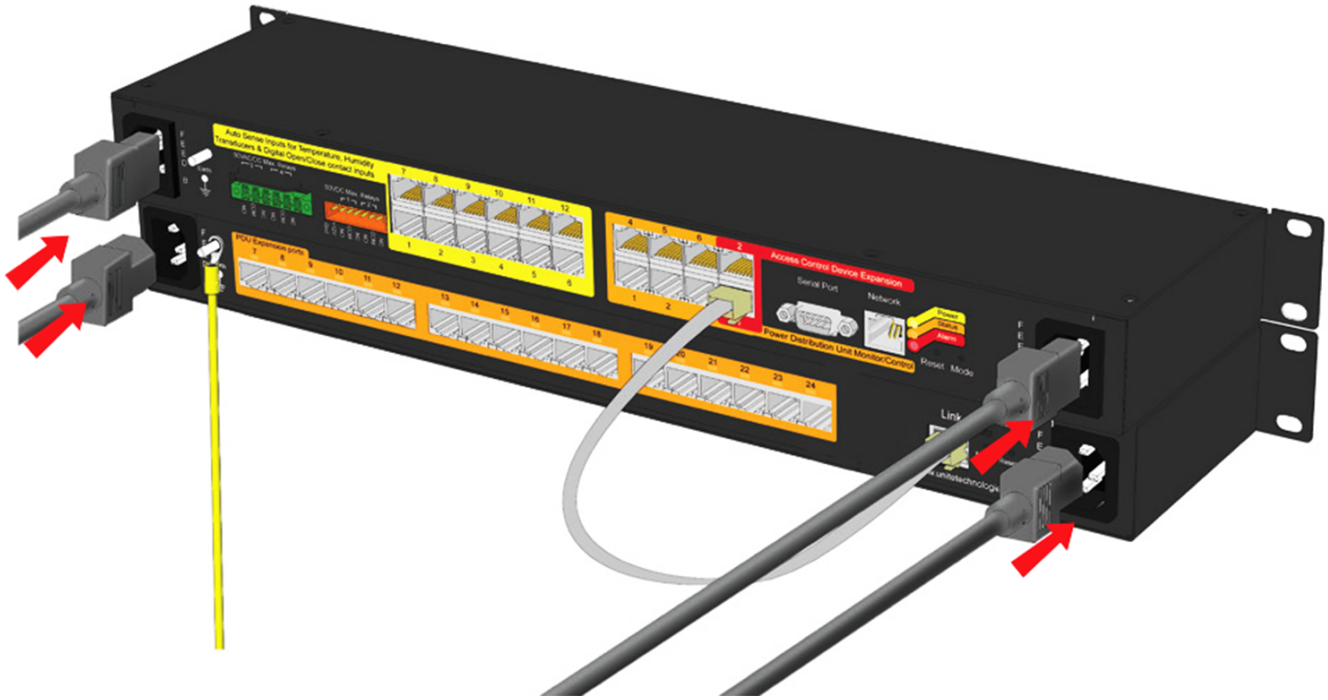
Installation

To install the EPAX18, perform the following steps.

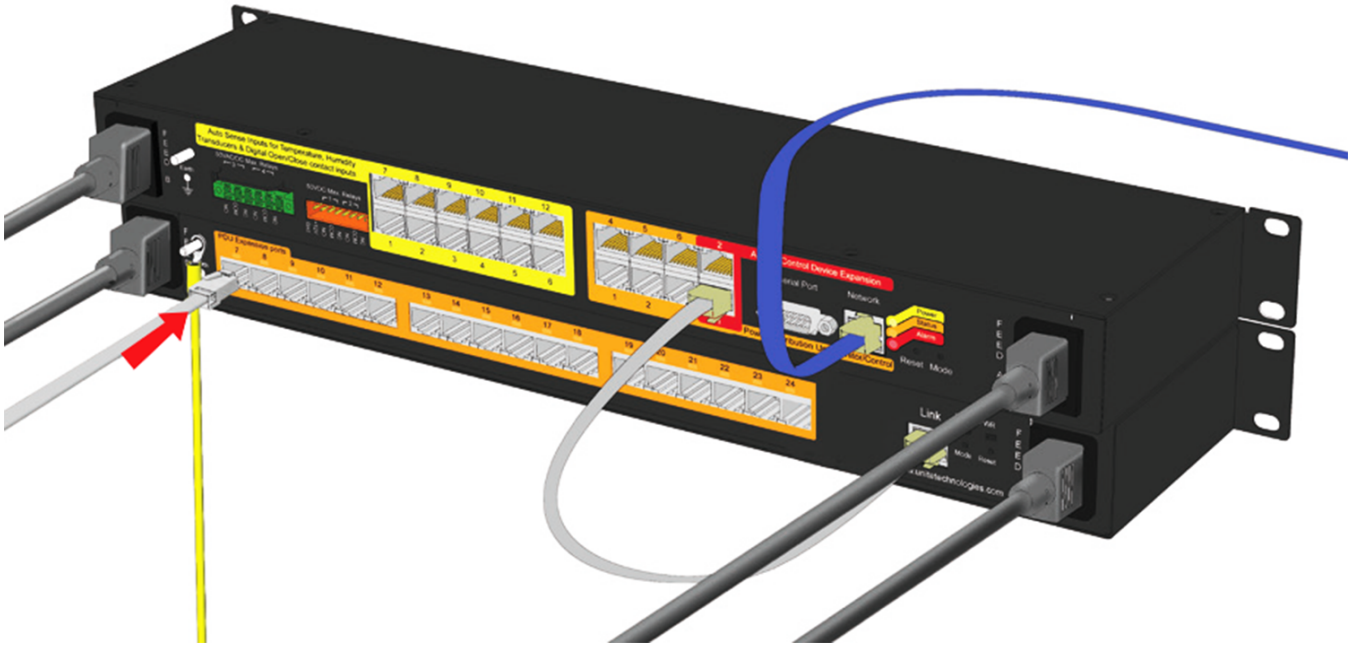
1. Link the EPAX18 to the EPA126 unit and connect a ground wire (not supplied).



2. Connect the power cords.

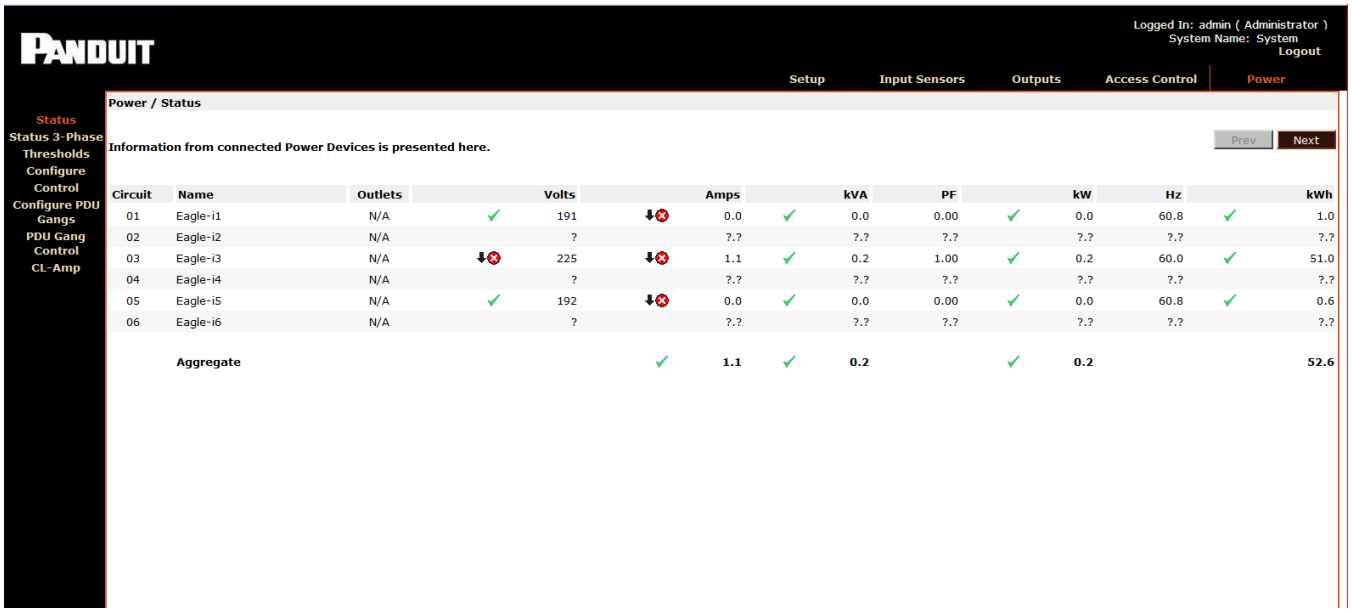


3. Connect the network and sensor cables (not supplied).

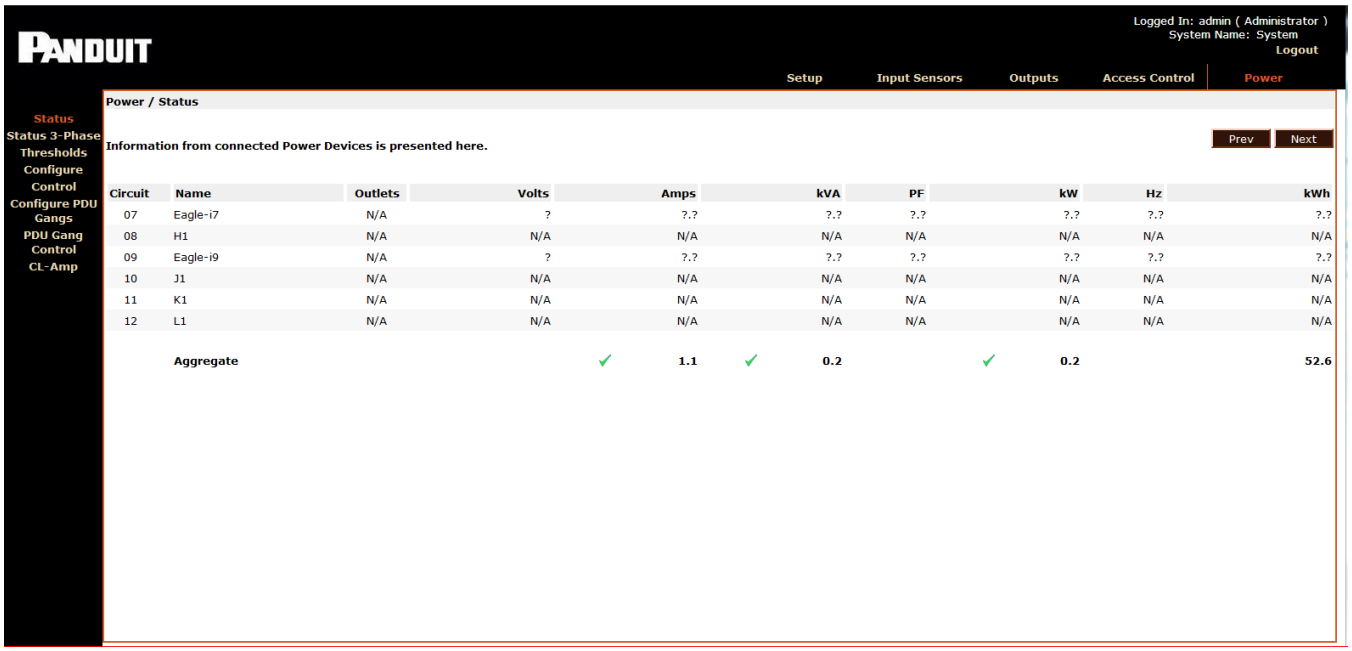


Gateway Web Management Interface PDU Display

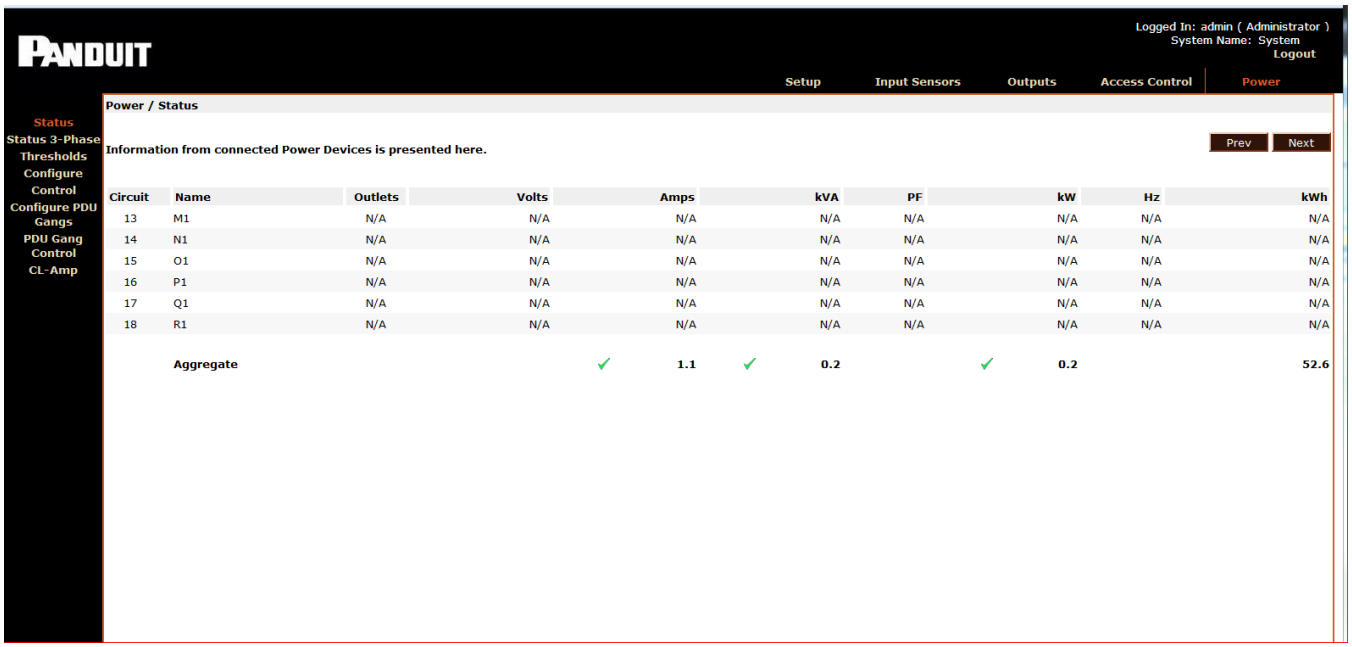
With the EPAX18 expansion connected to the EPA126, the 24 PDUs are displayed across four screens, each displaying six PDUs, as in the examples below.

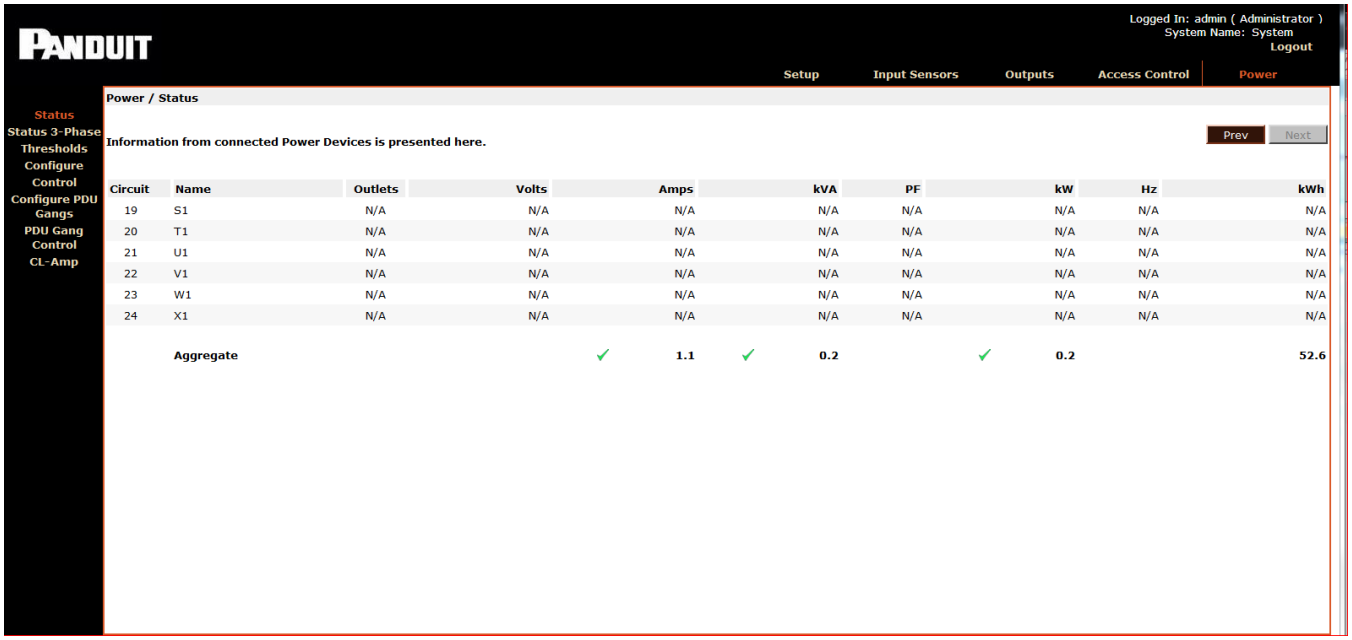


Circuit	Name	Outlets	Volts	Amps	kVA	PF	kW	Hz	kWh
01	Eagle-i1	N/A	191	0.0	0.0	0.00	0.0	60.8	1.0
02	Eagle-i2	N/A	?	?.?	?.?	?.?	?.?	?.?	?.?
03	Eagle-i3	N/A	225	1.1	0.2	1.00	0.2	60.0	51.0
04	Eagle-i4	N/A	?	?.?	?.?	?.?	?.?	?.?	?.?
05	Eagle-i5	N/A	192	0.0	0.0	0.00	0.0	60.8	0.6
06	Eagle-i6	N/A	?	?.?	?.?	?.?	?.?	?.?	?.?
	Aggregate			1.1	0.2		0.2		52.6



Circuit	Name	Outlets	Volts	Amps	kVA	PF	kW	Hz	kWh
07	Eagle-i7	N/A	?	?.?	?.?	?.?	?.?	?.?	?.?
08	H1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09	Eagle-i9	N/A	?	?.?	?.?	?.?	?.?	?.?	?.?
10	J1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	K1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	L1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Aggregate			1.1	0.2		0.2		52.6


PANDUIT
Logged In: admin (Administrator)
System Name: System
Logout
Setup
Input Sensors
Outputs
Access Control
Power
Status
Status 3-Phase
Thresholds
Configure
Control
Configure PDU Gangs
PDU Gang Control
CL-Amp
Power / Status
Information from connected Power Devices is presented here.
Prev
Next
Circuit Name Outlets Volts Amps kVA PF kW Hz kWh
13 M1 N/A N/A N/A N/A N/A N/A N/A N/A
14 N1 N/A N/A N/A N/A N/A N/A N/A N/A
15 O1 N/A N/A N/A N/A N/A N/A N/A N/A
16 P1 N/A N/A N/A N/A N/A N/A N/A N/A
17 Q1 N/A N/A N/A N/A N/A N/A N/A N/A
18 R1 N/A N/A N/A N/A N/A N/A N/A N/A
Aggregate ✓ 1.1 ✓ 0.2 ✓ 0.2 52.6


PANDUIT
Logged In: admin (Administrator)
System Name: System
Logout
Setup
Input Sensors
Outputs
Access Control
Power
Status
Status 3-Phase
Thresholds
Configure
Control
Configure PDU Gangs
PDU Gang Control
CL-Amp
Power / Status
Information from connected Power Devices is presented here.
Prev
Next
Circuit Name Outlets Volts Amps kVA PF kW Hz kWh
19 S1 N/A N/A N/A N/A N/A N/A N/A N/A
20 T1 N/A N/A N/A N/A N/A N/A N/A N/A
21 U1 N/A N/A N/A N/A N/A N/A N/A N/A
22 V1 N/A N/A N/A N/A N/A N/A N/A N/A
23 W1 N/A N/A N/A N/A N/A N/A N/A N/A
24 X1 N/A N/A N/A N/A N/A N/A N/A N/A
Aggregate ✓ 1.1 ✓ 0.2 ✓ 0.2 52.6

Temperature Sensor Adapter Installation

Follow the instructions below to install the ZAHTLADT-02 v1.01.01 temperature sensor adapter module. This adapter allows legacy sensors to provide more accurate temperature readings.

Note: This adapter does not work with the ZETHL-14 temperature sensor.

New Installations

Follow these instructions when you are installing a standard temperature sensor, but the upgraded sensor input is required.

1. Plug the adapter directly into the back of the gateway, at the sensor port to be used for temperature.
2. Plug the temperature sensor connector into the adapter.

3. Update the gateway firmware to the latest release.

Existing Installations.

Follow these instructions when the sensor is already installed along with the gateway.

1. Unplug the current temperature sensor from the gateway, noting the location where it resided.
2. Insert the adapter into that location.
3. Plug the sensor into the end of the adapter.
4. Perform these steps for all other temperature sensors to be changed.
5. The gateway firmware must be updated to the latest firmware.

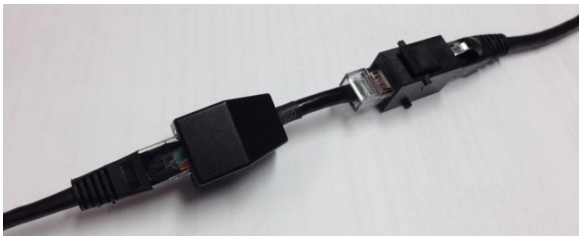
Before the adapter is fitted:

After the adapter is fitted:

Fitting the Adapter In-line.

This procedure is not recommended, but it may be the only solution in some cases.

1. Using a patch lead from the gateway and an RJ45 Jack to Jack through connector on its non-gateway end, plug the adapter RJ45 Plug into the through connector.
2. Plug either the RJ45 plug of a temperature sensor into the jack on the adapter or a patch lead with the temperature sensor on the end.



Troubleshooting

Resetting the SmartZone Gateway to Factory Default Settings

To reset the Gateway unit to factory defaults, perform the following steps:

1. Press and release the **Reset** button on the front of the unit. The Alarm LED will flash twice (off/on, off/on).
2. Immediately press and hold the **Mode** button until the alarm LED goes off.
3. Immediately press and release the **Reset** button.

NOTE: The unit will now restart. The Status LED will start flashing after around 1 minute. The reset process is complete, and the IP address is set to the default 192.168.0.253.

Problem: The NMS Cannot Poll the SmartZone Gateway Unit

- **Solution**: Make sure the network is properly connected to the Gateway unit.
- **Solution**: Make sure the cable is in good condition.
- **Solution**: Try pinging the Gateway unit from another computer on the same network segment as the Gateway unit.
- **Solution**: Ensure that the NMS IP Address is in the NMS table of the Gateway unit.
- **Solution**: Ensure that the community string has been set for the NMS via the Web Management Interface.

Technical Support

For technical support for the SmartZone Gateway system, please contact Panduit Technical Support using one of the following methods:

- 1-866-721-5302 (toll-free)
  - USA: 6:30 a.m. – 8:00 p.m. CST
  - India: 6:30 a.m. – 5:00 p.m. IST (8:00 p.m. – 6:30 a.m. CST)
  - On Call Support on Weekends
- systemsupport@panduit.com

Appendix A: Technical Details

Factory Default Settings

IP Address:	192.168.0.253
Subnet Mask:	255.255.255.0 (/24)
Default Gateway:	192.168.0.1
Web Management Address:	http://192.168.0.253/
Default username:	admin
Default password	admin

Operating Information

Input Power:	100-240 VAC (45W) 50-60 Hz
Operating Temperature:	0 ^{O}C to 40 ^{O}C
Storage Temperature:	-10 ^{O}C to 70 ^{O}C
Operating Humidity:	5% to 90% RH
Storage Humidity:	5% to 100% RH

CAUTION: There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

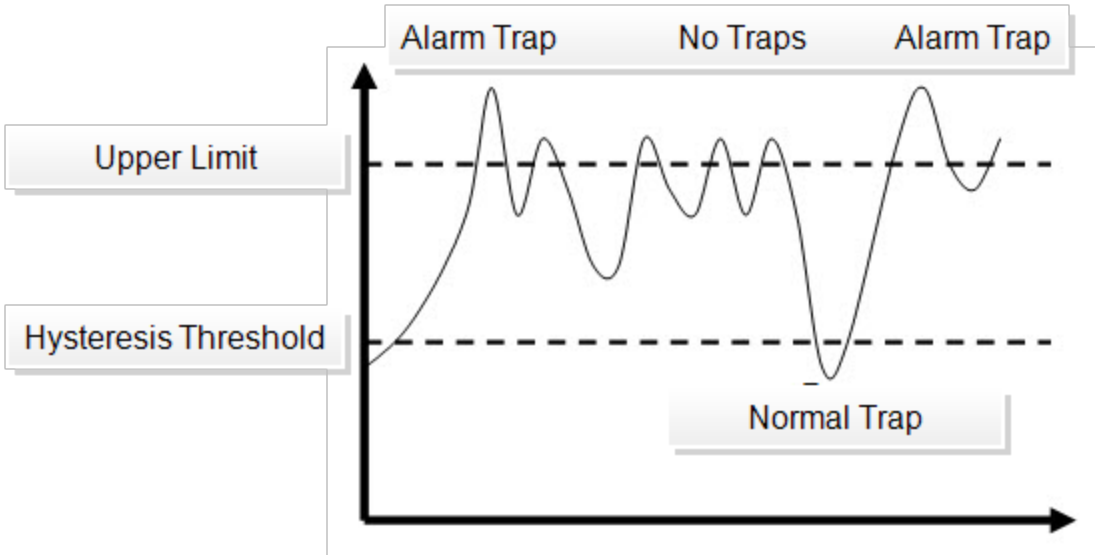
Appendix B: Hysteresis Demystified

When a temperature or humidity limit is reached and the relevant limit has its OFF to ON Trap enabled, an alarm trap is issued by the SmartZone Gateway unit.

With a zero hysteresis setting, the traps will continue to be generated each time the limit is reached.

This may be undesirable in a situation where the temperature or humidity level measure has reduced by only a small amount before rising again and triggering further traps.

The hysteresis function is provided to prevent further alarm traps from being generated until the measured value has fallen to a satisfactory level.



As shown in image above, the humidity first rises past its upper warning threshold, which generates an alarm trap.
The humidity then reduces slightly but does not reduce to the hysteresis level, which is 1.5% relative humidity lower than the alarm setting (1.5% relative humidity lower as an absolute measured value, rather than 1.5% of currently measured value).

Humidity then increases and decreases again. However, on the second decrease of humidity the level drops below the hysteresis level. The Humidity falling below the hysteresis level re-enables alarm traps for the next alarm event. An upper limit of 25 and a hysteresis threshold of 1.5 yield a threshold limit of 23.5.

The humidity level again begins to rise and again exceeds the upper limit, however this time an alarm trap is generated again.

The Hysteresis feature acts on the following Temperature and Humidity thresholds:

- Upper Control Limit (UCL)
- Lower Control Limit (LCL)
- Upper Warning Limit (UWL)
- Lower Warning Limit (LWL)

The inverse of the above description is true when applied to Temperature and Humidity lower control and warning limits.

You can configure the hysteresis threshold by using the menu options.

Appendix C: Networking Reference

Reference

This section discusses SNMP communities, IP addressing, subnet masking, routers and Gateways.

Communities

A community is a string of printable ASCII characters that identifies a user group with the same access privileges. For example, a common community name is “public”.
For security purposes, the SNMP agent validates requests before responding. The agent can be configured so that only managers that are members of a community can send requests and receive responses from a particular community.
This prevents unauthorized managers from viewing or changing the configuration of a device.

IP Addresses

Every device on an internetwork must be assigned a unique IP (Internet Protocol) address. An IP address is a 32-bit value comprised of a network ID and a host ID.
The network ID identifies the logical network to which a particular device belongs. The host ID identifies the particular device within the logical network.
IP addresses distinguish devices on an internetwork from one another so that IP packets are properly transmitted.
IP addresses appear in dotted decimal (rather than in binary) notation. Dotted decimal notation divides the 32-bit value into four 8-bit groups, or octets, and separates each octet with a period.
For example, 199.217.132.1 is an IP address in dotted decimal notation.
To accommodate networks of different sizes, the IP address has three divisions - Classes A for large, B for medium, and C for small.

The difference among the network classes is the number of octets reserved for the network ID and the number of octets reserved for the host ID:

Class	Value of First Octet	Network ID	Host ID	Number of Hosts
A	1-126	first octet	last three octets	16,387,064
B	128-191	first two octets	last two octets	64,516
C	192-223	first three octets	last octet	254

Any value between 0 and 255 is valid as a host ID octet except for those values reserved by the IPv4 standard for other purposes:

Value	Purpose
0, 255	Network Number & Broadcast
127	Loopback testing and interprocess communication on local devices
224-254	IGMP multicast and other special protocols

Subnetting and Subnet Masks

Subnetting divides a network address into subnetwork addresses to accommodate more than one physical network on a logical network.
For example: A Class B company has 100 LANs (Local Area Networks) with 100 to 200 nodes on each LAN.
To classify the nodes by its LANs on one main network, this company segments the network address into 100 subnetwork addresses (If the Class B network address is 150.1.x.x, the address can be segmented further from 150.1.1.x through 150.1.100.x.).
A subnet mask is a 32-bit value that distinguishes the network ID from the host ID for different subnetworks on the same logical network.
Like IP addresses, subnet masks consist of four octets in dotted decimal notation.
You can use subnet masks to route and filter the transmission of IP packets among your subnetworks.
The value “255” is assigned to octets that belong to the network ID, and the value “0” is assigned to octets that belong to the host ID.

Network Mask	Routing and Filtering
255.0.0.0	Class A network. First octet defines network number. Final three octets define host address. Valid Class A network numbers are in the range 1 to 126.
255.255.0.0	Class B network. First 2 octets define network number. Final two octets define host address. Valid class B network numbers are in the range 128.0.x.x to 191.255.x.x
255.255.255.0	Class C network. First 3 octets define network number. Final octet defines host address Valid class C network numbers are in the range. 192.0.0.x 223.255.255.x

Gateways

Gateway, also sometimes referred to as a router, is any device with two or more network adapters connecting to different physical networks.
Gateways allow for transmission of IP packets between different networks on an inter-network.

Appendix D: Pressure to Voltage Conversion

This appendix covers pressure-to-voltage conversion based on using the following equipment and settings:

- ZEDIFFPRESS-03
- Pressure Range: -0.625 to 0.625
- Voltage Output: 0 to 5V

Conversion equation:

*Voltage = 4 * pressure +2.5*

Note: Pressure is measured in units of H2O.

Based on the above information, here are the alarm points.

Measure	Upper Warning Limit	Upper Control Unit
Pressure	0.15	0.3
Voltage	3.1	3.7

Appendix E: Encryption and Security

The Gateways support HTTPS encryption, and they support the following cipher configurations.

- TLS_RSA_WITH_3DES_EDE_CBC_SHA
- TLS_RSA_WITH_DES_CBC_SHA
- TLS_RSA_WITH_AES_128_CBC_SHA
- TLS_RSA_WITH_AES_256_CBC_SHA

Appendix F: Upgrade with Usable Memory Space

Upgrade

Bootloader version	≥ 1.02.02	≤ 1.11.11
Application version	1.xx.xx	2.02.xx
Memory size	16MB or 32MB	16M or 32MB
Upgrade to ≥ v2.04.04	Supported	Supported
Enabled memory	16M	16M

Application and Bootloader Configurations and Resulting Memory Enabled Size

Bootloader	≥ 1.02.02 ≤ 1.11.11		≥ 1.11.12	≥ 1.11.12
Application	≥ 1.xx.xx ≥ 2.04.xx		2.04.xx	≥ 2.04.04
Physical memory	16M	32M	16M	32M
Memory enabled	16M	16M	16M	32M

The available memory size for a gateway can be determined by the hardware serial number:

- EP042: Serial number 12109 or later supports 16MB.
- EPA064: Serial number 21243 or later supports 32MB.
- EPA126: Serial number 19637 or later supports 32MB.