Owner Manual

Remote Monitoring System

PowerCommand® 500 (Spec A)
PowerCommand® 550 (Spec A)

English
Original Instructions
2-2014
A040R086 (Issue 2)

Table of Contents

1 Important Safety Instructions

1.1 Warning, Caution, and Note Styles Used In This Manual

The following safety styles and symbols found throughout this manual indicate potentially hazardous conditions to the operator, service personnel, or the equipment.

⚠ DANGER
Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

⚠ WARNING
Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

⚠ CAUTION
Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE
Indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

1.2 General Safety Precautions

The PowerCommand 500/550 Remote Monitoring network can be used to remotely monitor and control power transfer equipment, such as transfer switches, and start and stop generator sets. All of the safety precautions for the equipment being monitored and controlled by the network must be observed. Refer to the appropriate Operator Manual for important safety precautions.

This page is intentionally blank.

2 Introduction

2.1 About this Manual

The PC500/550 Owner Manual provides the instructions necessary for operating, installing, and troubleshooting the PowerCommand network.

2.2 List of Abbreviations and Acronyms

TABLE 1. ABBREVIATION AND ACRONYM DEFINITIONS

Abbreviation or Acronym	Definition
AC	Alternating Current
ATS	Automatic Transfer Switch
BMS	Building Management System
CCM	Custom Communication Module
CDMA	Code Division Multiple Access
CSV	Comma-Separated Values
DC	Direct Current
GSM	Global System for Mobile
I/O	Input/Output
IMEI	International Mobile Equipment Identity
LED	Light Emitting Diode
MEID	Mobile Equipment Identifier
NMS	Network Management System
OTG	On The Go
PC	PowerCommand
PCC	Power Command Control
PDU	Protocol Data Units
RTU	Remote Terminal Unit
SD	Secure Digital
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SSL	Secure Socket Layer
TCP/IP	Transmission Control Protocol/Internet Protocol
UI	User Interface
USB	Universal Serial Bus
VDC	Volts Direct Current

2.3 How to Obtain Service

When the PC500/550 requires servicing, contact your nearest authorized Cummins Power Generation distributor. To locate your local Cummins Power Generation distributor, refer to **www.power.cummins.com** and select Distributor Locator. When contacting your distributor, always supply the complete model and serial number.

2.3.1 In North America

Call +1 800-888-6626 for the nearest Cummins Onan distributor in the United States or Canada. Press 1 (option 1) to be automatically connected.

If unable to contact a distributor using the automated service, consult the Yellow Pages. Typically, our distributors are listed under: generators - electric.

2.3.2 Outside North America

Call Cummins Power Generation at +01 763 5745000 from 7:30 AM to 4:00 PM (Central Standard Time), Monday through Friday.

3 Description

3.1 Models

The following table shows the features and functionality of the PC500/PC550, as well as the differences between the PC500 and PC550.

Feature/Functionality	PC500	PC550
Number of Devices Supported	Up to 2 Devices (any combination)	Up to 12 Devices (any combination)
Supported Device Types	Generator Set, ATS, CCM-T, CCM-G, AUX101/102	Generator Set, ATS, CCM-T, CCM-G, AUX101/102
Inputs/Outputs (I/O)	2 Discrete Inputs, 2 Discrete Outputs, 1 Resistive Input	2 Discrete Inputs, 2 Discrete Outputs, 1 Resistive Input
Expandable I/O	AUX101: 8 Configurable Inputs/8 Discrete Outputs AUX102: 4 Non-configurable Discrete Inputs/8 Discrete Outputs	AUX101: 8 Configurable Inputs/8 Discrete Outputs AUX102: 4 Non-configurable Discrete Inputs/8 Discrete Outputs
Notifications	SMTP/Email, SMS/Text, and SNMP Traps	SMTP/Email, SMS/Text, and SNMP Traps
Connection to Supported Devices	Modbus	Modbus
Data Access	Through Web UI Modbus TCP	Through Web UI Modbus TCP
Data Export	No	Yes
Certifications/Compliance	UL, CSA, CE, FCC, RoHS	UL, CSA, CE, FCC, RoHS

The PC500 and PC550 each have 3 models.

Model	Description
PC500LAN/PC550LAN	Access over LAN connection. Text messages cannot be sent.
PC500GSM/PC550GSM	Access over LAN connection. Obtain notifications through GSM modem (requires SIM card).
PC500CDMA/PC550CDMA	Access over LAN connection. Obtain notifications through CDMA modem.

3.2 Remote Monitoring System

The remote monitoring system provides web server capabilities and diagnostics that collect and store data from Cummins Power Generation and third party equipment including: generator sets, automatic transfer switches (ATSs) and sensors.

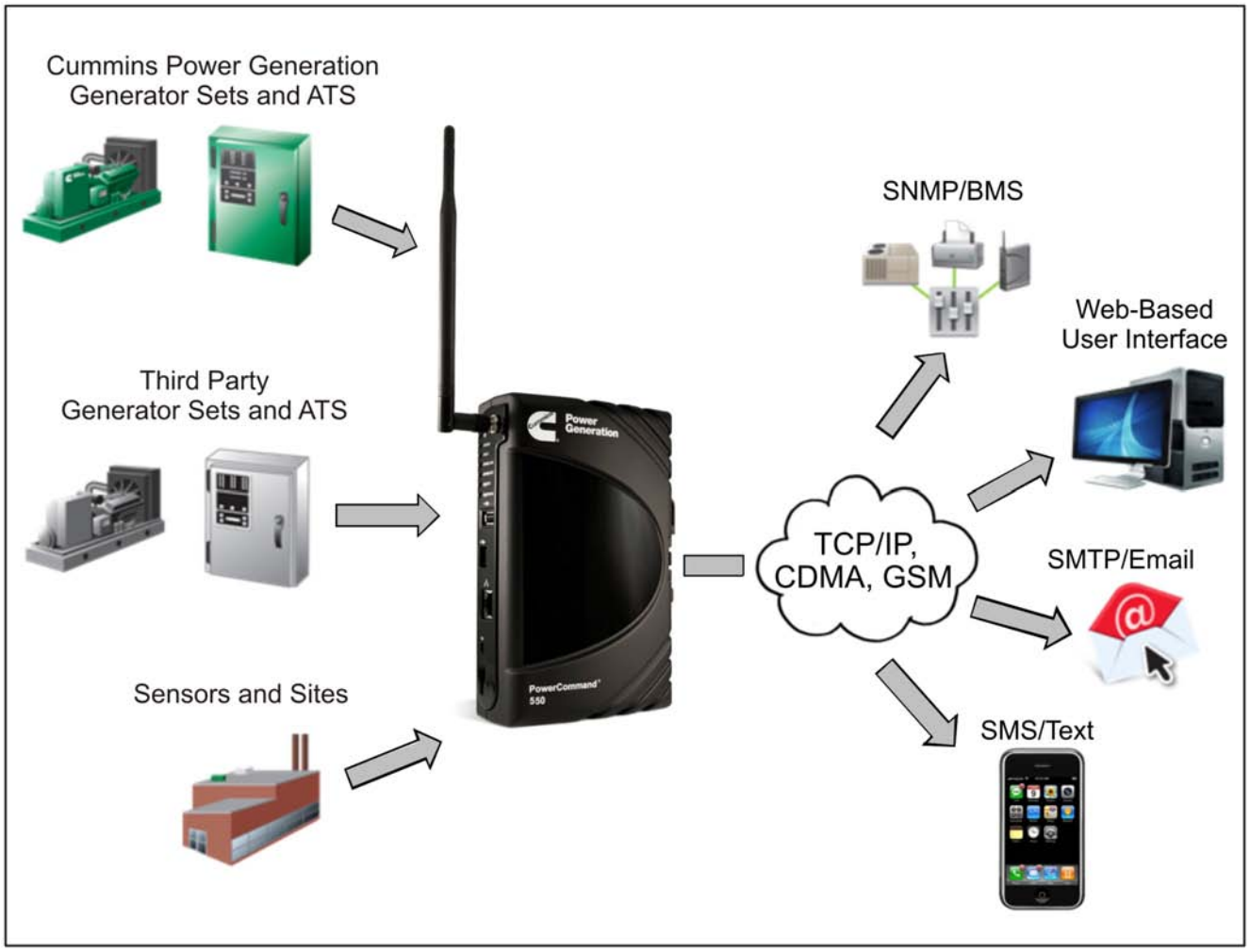


FIGURE 1. REMOTE MONITORING SYSTEM

3.3 Controls

The remote monitoring system supports the following generator set controls.

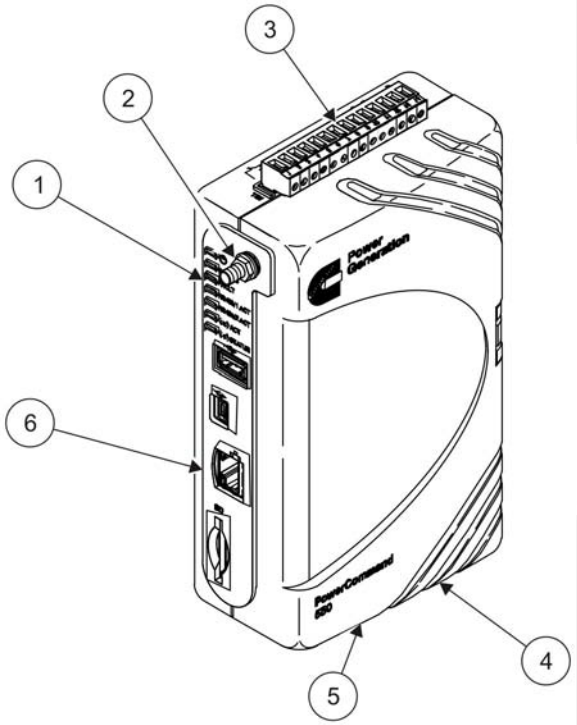
Control	Communication
PC1301	Modbus
PC1302	Modbus
PC2300	Modbus
PC3300	Modbus
PC2100	Modbus through Modlon Gateway
PC3100	Modbus through Modlon Gateway
PC3200	Modbus through Modlon Gateway
PC3201	Modbus through Modlon Gateway

The remote monitoring system supports the following ATS controls.

Control	Communication
OTPC	Modbus through Modlon Gateway
OHPC	Modbus through Modlon Gateway
CHPC	Modbus through Modlon Gateway
BTPC	Modbus through Modlon Gateway
CCM-T	Modbus through Modlon Gateway

The PC500/550 reads I/Os from third party generator set and ATS controls either by directly connecting the I/Os to the PC500/550 or connecting to an AUX101 I/O device, which can then be read over Modbus.

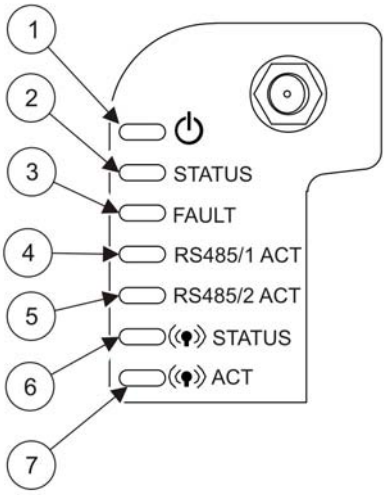
3.4 PC500/550



No.	Description	No.	Description
1	LED Indicators	4	TB2
2	Antenna Connection	5	Reset Button
3	TB1	6	Ports

FIGURE 2. PC500/550

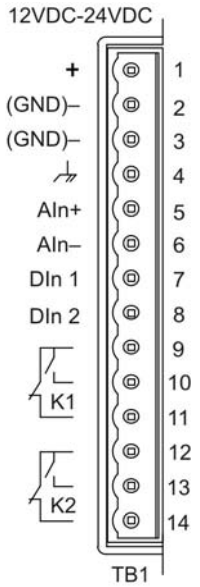
3.4.1 LED Indicators



No.	Name	Description
1	Power	Illuminates (green) when the PC500/550 power is on.
2	STATUS	Blinks (green) at a 1-per-second rate to indicate application firmware on PC500/550 is operating correctly.
3	FAULT	Illuminates (red) when there is an active error fault on PC500/550.
4	RS485/1 ACT	Blinks (yellow) to indicate RS485/1 activity.
5	RS485/2 ACT	Blinks (yellow) to indicate RS485/2 activity.
6	STATUS	Illuminates (green) when wireless module is installed, enabled, and detecting adequate signal strength.
7	ACT	Blinks (green) to indicate wireless activity.

FIGURE 3. LED INDICATORS

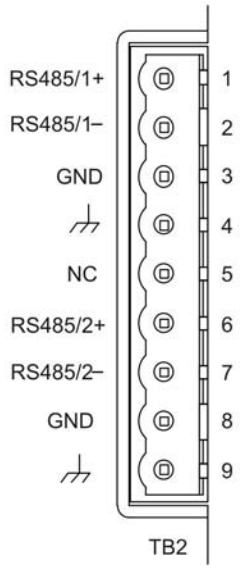
3.4.2 TB1



No.	Name	Description
1	+	Input from 12–24 VDC power supply or B+ battery.
2	(GND)–	Ground from power supply or B– battery.
3	(GND)–	Ground from power supply or B– battery.
4	Chassis Ground	Connected to an earth grounded metal surface.
5	AIn+	Analog resistive input connection for a resistive sensor into the PC500/550 (600–2500 ohms).
6	AIn–	Return for analog resistive input connection for a resistive sensor into the PC500/550 (600–2500 ohms).
7	DIn 1	Isolated 'open-collector' type discrete input activated when connected to the PC500/550 GND (power supply or B–).
8	DIn 2	Isolated 'open-collector' type discrete input activated when connected to the PC500/550 GND (power supply or B–).
9	K1	Discrete output from PC500/550 K1 (common).
10	K1	Discrete output from PC500/550 K1 (normally open).
11	K1	Discrete output from PC500/550 K1 (normally closed).
12	K2	Discrete output from PC500/550 K2 (common).
13	K2	Discrete output from PC500/550 K2 (normally open).
14	K2	Discrete output from PC500/550 K2 (normally closed).

FIGURE 4. TB1

3.4.3 TB2



No.	Name	Description
1	RS485/1+	The positive referenced differential signal for RS485/1.
2	RS485/1–	The negative referenced differential signal for RS485/1.
3	(GND)	RS485/1 ground connection between PC500/550 and monitored devices. Used with a separate power supply.
4	Chassis Ground	Connected to shield of the Modbus cable.
5	NC	Not used.
6	RS485/2+	The positive referenced differential signal for RS485/2.
7	RS485/2–	The negative referenced differential signal for RS485/2.
8	GND	RS485/2 ground connection between PC500/550 and monitored devices. Used with a separate power supply.
9	Chassis Ground	Connected to shield of the Modbus cable.

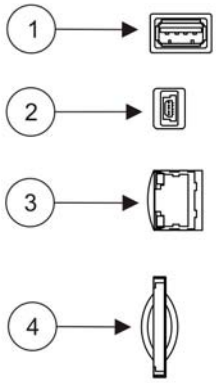
FIGURE 5. TB2

3.4.4 Reset Button

The **Reset** button is located above TB2. Pressing the button cycles power to the processor.

NOTICE
Factory settings are not reset.

3.4.5 Ports



No.	Name	Description
1	USB	Connection to USB flash drive. Provides extended memory for data logs.
2	USB Mini	Direct connection to a PC (used for initial configuration of the PC500/550).
3	Ethernet	Connection to network. Supports IEEE 10 BASE-T and 100 BASE-TX standards.
4	SD Card Slot	Provides extended memory for data logs.

FIGURE 6. PORTS

This page is intentionally blank.

4 System Functions and Features

4.1 User Interface

The PC500/550 has a web-based user interface that can be accessed over a TCP/IP connection via Internet Explorer or a USB connection. The user interface is very intuitive and displays information about the configured power system. Information includes device status, data and event logs, reports, diagnostic information, and a setup menu for configuring the system.

4.2 Modbus RTU

Modbus remote terminal unit (RTU) is the serial communication protocol that the PC500/550 uses to communicate with generator set, ATS, and AUX101/102 controls. There are 2 Modbus channels that communicate to a maximum of 12 devices. Devices can be divided between the 2 channels. Each channel is capable of handling 12 devices but the total of number of devices on both channels cannot exceed 12. No more than 3 AUX101/102 devices can be configured in the system.

4.3 Modbus TCP

The Modbus transmission control protocol (TCP) messaging service provides client-server communication between Modbus TCP client and PC500/550 server. PC500/550 responds to Modbus/TCP requests but does not initiate communication.

The PC500/550 uses a default port 502 for all Modbus/TCP communication (can be changed in configuration). Modbus TCP has read-only access for all generator set, ATS, and I/O parameters. The parameters can be accessed as contiguous registers unlike their Modbus RTU counterparts.

The Ethernet port on the PC500/550 that is used to obtain network settings is also used for Modbus TCP output.

In summary, Modbus TCP enables the PC500/550 to function as a:

- Server handling client requests for PC500/550 specific registers.
- Gateway between the Ethernet TCP/IP network and Modbus serial line devices connected over Modbus RTU.

Refer to *Modbus Register Mappin*g (A029X159) for information on Modbus register mapping for the PC500/550.

4.4 Notifications

The PC500/550 supports 3 types of notifications:

- SMS (Text Message)
- SMTP (Email)
- SNMP Trap (v1 and v2c)

Notifications are configured to be sent when events become active on the system. SMS and SMTP notifications are delivered to users based on their user group memberships and contact details entered during user/user group setup. SNMP traps (when enabled) are sent for every event that becomes active in the system. Notifications include all of the details of an event (time stamp, source, event code, event type, and description.

A network connection is required for SMTP and SNMP notification delivery. SMS messages are delivered over the cellular network via GSM or CDMA modems when they are available and activated.

4.5 SNMP

SNMP is one of the widely accepted protocols to manage and monitor network elements. Most of the professional-grade network elements come with a bundled SNMP agent. These agents have to be enabled and configured to communicate with the network management system (NMS).

A trap is a one-way message sent from a network element to the NMS. The PC500/550 serves as a network element and uses SNMP to send out trap notifications to a management system. When enabled, traps are sent for every event that becomes active on the system. The trap carries all of the details of an event (time stamp, source, event code, event type, and description).

The PC500/550 supports the following versions of SNMP:

- SNMP v1 - The first version of the protocol that is defined in RFCs 1155 and 1157. It specifies five core protocol data units (PDUs)
- SNMP v2C - A revised protocol that includes enhancements to SNMP v1 in the areas of protocol packet types, transport mappings, and MIB structure elements. The SNMP v1 administration structure is used. It is defined in RFC 1901, RFC 1905, RFC 1906, and RFC 2578.

4.6 External Memory

The PC500/550 supports the use of an SD card and a USB flash drive as external memory devices. The external memory devices are used to extend data logging storage. Only one storage device can be selected for use at a time. The PC500/550 erases all existing data on the external memory device before using it; therefore, to avoid data loss, a new or empty storage device should be used.

4.7 Reports

The PC500/550 can generate reports for a device which contains a detailed summary of all the selected parameters over a specified time duration.

A report can be generated for a device that contains selected parameters from the data log over a preset time duration (last day, last week, last month, custom). Report duration cannot exceed 31 days. The report shows a graphical representation of each selected parameter. Parameters are plotted on a time scale with a summary of the minimum, maximum, and average values.

A data report can be exported in a CSV file format for further analysis.

4.8 Sensors and Output Controls

The PC500/550 supports the addition of analog and discrete sensors, and output controls.

- Analog sensors are used to measure quantity. Examples of analog sensors are fuel, temperature, pressure, and voltage sensors.
- Discrete sensors only have 2 values which are used to read on/off status. Examples of discrete sensors are generator set run status, switch on/off status, and door open/close status.
- Output controls are used to turn an object on or off by opening or closing dry contacts. Output controls can be used for starting/stopping a generator set, starting/stopping an ATS test, turning a light on/off, etc.

Sensors and output controls that have been configured are displayed on the home page and device details under Site IOs.

The PC500/550 has 5 on-board I/Os:

- 2 discrete inputs
- 2 discrete inputs
- 1 analog resistive input (600–2500Ω)

When required, an AUX101/102 can be used to expand the PC500/550 I/O capabilities. No more than 3 AUX101/102 devices can be configured.

The AUX101 provides:

- 8 analog/discrete inputs (configurable)
- 8 outputs

The AUX102 provides:

- 4 discrete inputs (not configurable)
- 8 outputs

4.9 Data Log

The PC500/550 data log is a record of device data that has been saved over an extended period of time. The PC500/550 logs data for all connected devices based on the user-configured time interval (minutes, hours, days).

PC550 data logs can be exported to a CSV file and saved onto a user's personal computer for further analysis.

4.10 Event Log

The PC500/550 event log is a record of events that occur on the system over an extended period of time. The PC500/550 logs all events that occur on configured devices as well as the PC500/550.

The event log can be exported to a CSV file for further analysis.

4.11 Diagnostics

The PC500/550 provides diagnostic information on Modbus communication, system services, memory utilization, wireless status, and system information.

- Modbus Communications - Provides communications status for each configured device, including Modbus channel; number of Modbus packets sent, received, and failed; and date/time of the last successful communication.
- Processes - Lists all of the processing running on the PC500/550 server.
- Services - Lists all of the services running on the PC500/550 server.
- Performance - Provides memory utilization and overall system performance.
- System Information - Provides the device model, hardware version, modem type, IMEA or MEID number, OS version, software version, build number, and last update date and time for the PC500/550 system.
- Wireless Data - Provides modem type (CDMA, GSM), carrier, mobile number, signal strength, activation status (CDMA only), frequency band, and total SMS sent.

4.12 User Access Levels

The PC500/550 supports 3 types of users: Administrator, Operator, and Read Only. Administer can create users and assign them any of the 3 access levels. The permissions for each access level are shown below.

TABLE 2. ACCESS LEVEL PERMISSIONS

Access Level	Setup Menu	Device Control	Data and Event Log	Reports	Diagnostics
Administrator	Read/Write	Read/Write	Read/Export	Read/Export	Read/Write
Operator	Read	Read/Write	Read/Export	Read/Export	Read/Export
Read Only	Read	Read	Read	Read	Read

4.13 Secure Socket Layer

Secure Socket Layer (SSL) is a standard security protocol that provides communication security over the Internet. SSL provides a secure connection between two machines operating over the Internet or an internal network. SSL protects confidential data by creating a uniquely encrypted channel for private communication. It helps prevent hackers from tapping into client-server communication and misuse of confidential data.

The PC500/550 uses a self-signed SSL certificate due to the fact that the PC500/550 host name and IP address are configurable. Self-signed certificates provide the exact same protection as certificates created by a certificate authority. All data sent to and from the PC500/550 is encrypted for security.

When SSL is enabled in the Network Settings Setup menu of the UI, users must use **https://** in the Internet Explorer address bar in order to access the UI.

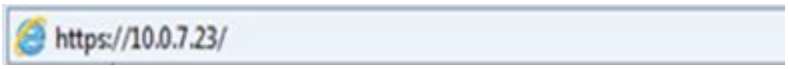


FIGURE 7. HTTPS EXAMPLE

This page is intentionally blank.

5 System Requirements

5.1 Hardware Requirements

The following hardware is required.

- A PC or Macintosh computer with a CD drive.
- Minimum screen resolution of 1024 x 768.

5.2 Software Requirements

The following software is required.

- Browser: Internet Explorer 8 or later is recommended
- Operating System:
  - Microsoft Windows
  - Mac OS X
  - Linux
- Microsoft Silverlight software, version 5 or later
- Windows Mobile Device Center
- Internet Speed: At least 1 Mbps

5.3 Hardware Installation

The PC500/550 has a NEMA (IP 10) rated enclosure and is not designed to handle environmental conditions, such as moisture. A moist environment can cause failure over time.

Mount the PowerCommand 500/550 in a suitable location, such as:

- On a DIN rail (35 mm)
- In a telecommunications, information technology, or networking cabinet
- In an office on a desk or other flat surface

NOTICE
Do not mount the PC500/550 inside a generator set or ATS enclosure. Doing so voids certifications.

An antenna extension cable is required if, due to location, the PC500/550 does not detect a wireless connection.

FIGURE 8. MOUNTING EXAMPLES

5.3.1 Supplied Hardware

The following hardware is available for order with the PC500/550.

Hardware	Description
USB-OTG Cable	Allows direct connection to a PC to configure devices.
Ethernet Cable	Allows connection to the network. Supports IEEE 10BASE-T and 100BASE-TX standards.
Modlon II Gateway Kit (541-1149) and Modlon Connection Cable Kit (TBD)	Required for: PCC2100, PCC3100, PCC3200, PCC3201 generator set controls OTPC, BTPC, OHPC, and CHPC ATS controls CCM.
Antenna Extension (12 ft)	Required for cabinet installations and if wireless strength is weak. ***NOTICE*** **12 feet is the maximum acceptable length for the antenna extension cable. A longer cable will degrade the signal.**

5.3.2 Additional Hardware Needed

The following hardware may be required in addition to the supplied hardware:

Hardware	Description
Modbus Cable	Twisted shielded pair cable (24 AWG or larger) used to connect the PC500/550 to the monitored device (Belden 3106A or equivalent).
Power Supply	12–24V, 12V - 250mA, 24V - 125mA, 5W minimum (UPS is recommended).
SIM Card	Required for GSM wireless modem (needs to be activated by a local provider).

Hardware	Description
Secure Digital (SD) Memory Card	Needed to extend memory for data logs.
USB Flash Drive	Needed to extend memory for data logs.

5.3.3 Connections/Installation

1. Connect the Ethernet cable from the PC500/550 to the installation site network (Ethernet hub/switch).
2. Antenna Installation (Wireless option only - GSM or CDMA cell modem):
   - Open Installation
     a. Attach antenna to the SMA connector on the PC500/550.
     b. Contact a cellular service provider and activate service (CDMA modem or SIM card).
   - Metal Enclosure Installation
     a. Choose a location for the antenna, preferably near the top of the cabinet.
     b. Create a 7mm (9/32 in) hole and install the bulkhead end of the antenna extension cable.

NOTICE
If the cabinet is NEMA rated, make sure the perforation is properly sealed to prevent loss of the NEMA ratings.

     c. Connect the SMA straight plug end of the connector to the PC500/550.
     d. Attach the antenna to the bulkhead connector side of the antenna extension cable located on the outside of the cabinet.
     e. Contact a cellular service provider and activate service (CDMA modem or SIM card).
3. Modlon Connections: Install a Modlon II Gateway (541-1149) for converting LonWorks to Modbus communications. When connecting to the Modlon Gateway, use the Modlon Connection cable (TBD).
   a. Connect the DB9 connector of the Modlon Connection Cable to the DB9 header on the Modlon.
   b. Connect the other end of the cable to the corresponding points on the PC500/550 terminal block TB2. Either channel is acceptable.
4. Modbus Connections:
   a. Connect a twisted pair of the Modbus cable to the RS-485 connector on the generator set control board or AUX101 control to the corresponding points on the PC500/550 terminal block TB2. Either channel is acceptable.
   b. If the installation is for a separate power supply, connect a ground reference wire.
   c. Connect the cable shield to either Chassis Ground on TB2 of the PC500/550 or the ground pin on the generator set, ATS, or AUX101 control (not both).

5. Sensor and Output Control Connections: Make the appropriate connection(s) to TB1 of the PC500/550 using a standard 24 AWG or larger wire.
   - Wire the appropriate sensor (fuel sensor, for example) to AIn + and AIn–.
   - Wire desired devices to discrete inputs (DIn 1, DIn 2) and outputs (K1 and K2).
6. If required, insert an SD card or USB flash drive for extended memory.
7. Connect the PC500/550 to a 12/24 VDC generator set battery or an isolated DC power supply.
8. Check the Power LED to confirm power is available.
9. Check Status LED to confirm application software is operating correctly.
10. Mount the PC500/550 on a DIN rail or install in a suitable location.

5.4 Modem Activation

- GSM Modem
  1. Contact wireless provider/partner/reseller to obtain an account and a SIM card.
     a. Provide billing information.
     b. Specify wireless service required (SMS only).
     c. Provide SIM card requirement specifications (2G/GPRS).
     d. Provide modem 15-character International Mobile Equipment Identity (IMEI) Number (located on product label and on User Interface **Setup** > **System Settings** page).
     e. User may need to provide the modem model number (MTSMC-G2).
  2. The modem is ready for use once the SIM card is activated, installed in the modem, and the PC500/550 is powered up.
  3. Verify the modem information (activation status, mobile number, wireless signal strength, and frequency band) on the User Interface by navigating to the **Diagnostics** page and selecting the **Get Wireless Data** button.
  4. Verify the region's operating frequency band and set the GSM modem frequency accordingly. Settings are located on the User Interface **Setup** > **System Settings** page.
- CDMA Modem
  1. Contact Verizon to setup a wireless account.
     a. Provide Mobile Equipment Identifier (MEID) Number (located on product label and on User Interface **Setup** > **System Settings** page).
     b. User may need to provide the modem model number (MTSMC-C1-N3).
     c. Retain the 10-digit modem phone number provided by Verizon.
  2. Once the Verizon wireless account has been set up, activate the modem from the User Interface by navigating to **Setup** > **System Settings** and selecting the **Activate CDMA Modem** button.

3. Verify the modem information (activation status, mobile number, wireless signal strength, and frequency band) on the User Interface by navigating to the **Diagnostics** page and selecting the **Get Wireless Data** button.

5.5 Getting Started

1. Turn on the computer.
2. Connect the PC500/550 to the network using an Ethernet cable.
3. Connect the USB-OTG cable from the PC500/550 to the computer. The computer automatically installs a software driver. If driver is not automatically installed, install "Windows Mobile Device Center" manually.
4. Open an Internet browser window and go to **Tools** > **Internet Options** > **Connections** > **LAN Settings**. Under **Proxy Server**, uncheck the box for **Use a Proxy server for your LAN**. Select **OK** twice.
5. In the Internet browser window, enter the following IP address: **169.254.0.1**. The browser displays the PC500/550 login screen.

NOTICE
Use https when SSL security is enabled or http when it is disabled.

This page is intentionally blank.

6 Setup

6.1 Getting to Setup Menu

FIGURE 9. LOGIN SCREEN

NOTICE
The first time logging into the system, enter admin for both the Username and Password.

1. Enter your **Username** (or **Email Address**) and **Password**.

NOTICE
An Email address can be entered if your username is unknown or forgotten. SMTP server settings must be set up properly for the system to send out an email.

2. Select **Login** or press the **Enter** key.

NOTICE
The system automatically logs off after a period of inactivity. The default setting is 30 minutes. This setting can be changed in the System Settings setup menu.

3. After logging into the system, the home page is displayed with a menu bar at the top. Select **Setup** to navigate to the **Setup** menu.

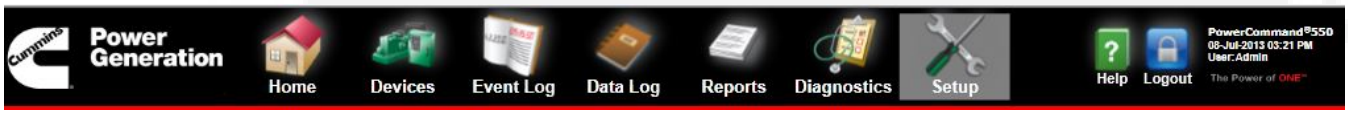


FIGURE 10. MENU BAR

6.2 Setup Menu

NOTICE
An Administrator user access level is required to configure settings from the Setup Menu.

FIGURE 11. SETUP MENU

The setup menu contains 12 tiles used to configure the entire system. Selecting a setup tile opens the appropriate setup page. All other setup selections are shown on the left side menu.

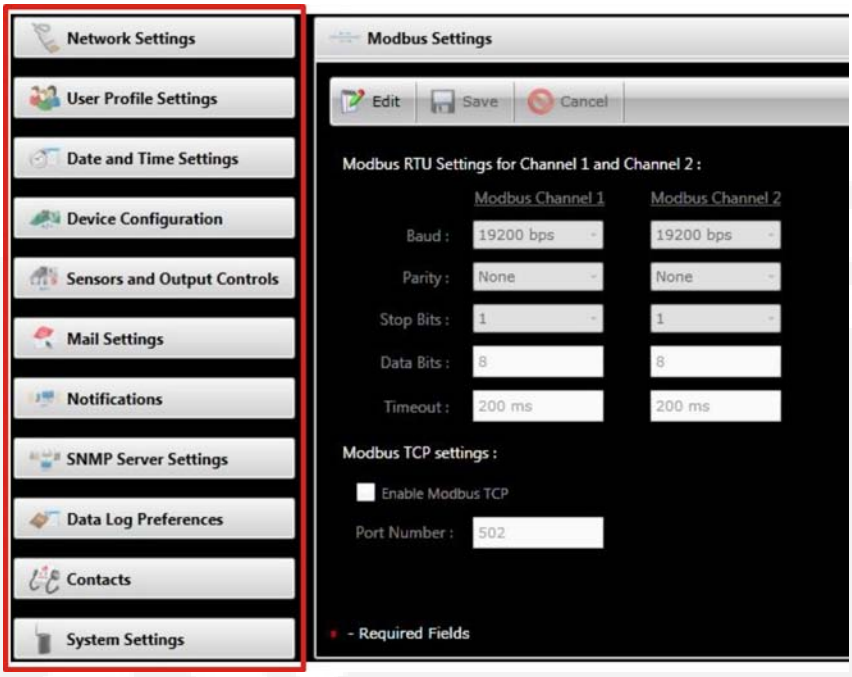


FIGURE 12. SETUP SIDE MENU

6.3 Network Settings

Network Settings are needed to provide Internet and Intranet access. The PC500/550 must be plugged into the network, via an Ethernet cable, in order for the network settings to take effect. The administrator can choose to obtain the settings automatically, or manually enter the settings. If the user chooses to manually enter the DHCP settings, the DNS settings must also be entered manually.

Network Settings also allows security settings to be changed by enabling or disabling SSL.

To update Internet and Intranet addresses:

1. Select **Network Settings** on the Setup menu.

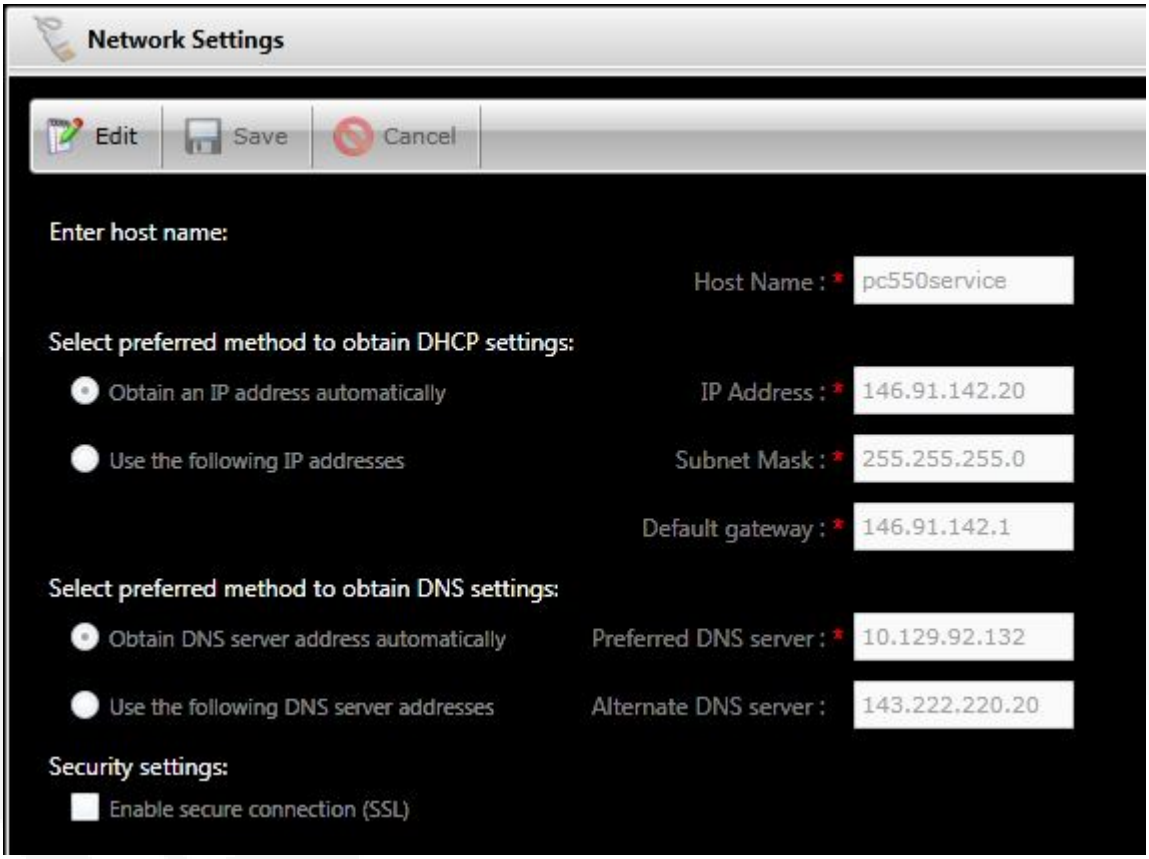


FIGURE 13. NETWORK SETTINGS

2. Select **Edit** from top menu bar to enable editing of the network settings fields.
3. Enter Host Name.
4. Select either **Obtain an IP address automatically** or **Use the following IP address** for DHCP settings.
5. If **Use the following IP address** was selected:
    a. Enter the DHCP IP Address, Subnet Mask, and Default gateway.
    b. Enter the DNS Preferred DNS server.
    c. Enter the DNS Alternate DNS server if desired.
    d. Select **Save**. The device can now be accessed using the IP address.

NOTICE
When manually entering IP address information, the network administrator needs to map the IP address to the host name to provide access to the device using a host name.

6. If **Obtain an IP address automatically** is selected, the new IP addresses are automatically populated when the device is physically plugged into the network via the Ethernet cable. The device can now be accessed using the host name or the IP address.

NOTICE
The USB-OTG cable can now be disconnected.

To enable SSL:

NOTICE
The PC500/550 User Interface is only accessible using the Internet Explorer web browser.

1. Select **Edit** from top menu bar to enable editing of the network settings fields.
2. Select the **Enable secure connection (SSL)** check box.
3. Select **Save**.

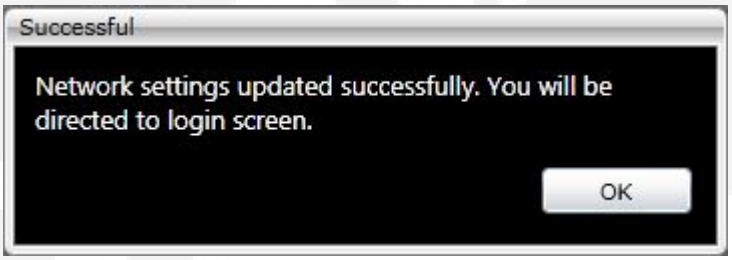


FIGURE 14. NETWORK SETTINGS UPDATED SUCCESSFULLY

NOTICE
It may take a several minutes before the Successful screen is displayed. SSL encryption is a processor intenstive utility and may cause slower system performance at times.

4. Select **OK**.
5. The following screen may appear before the login screen. This is expected and does not indicate a security threat.

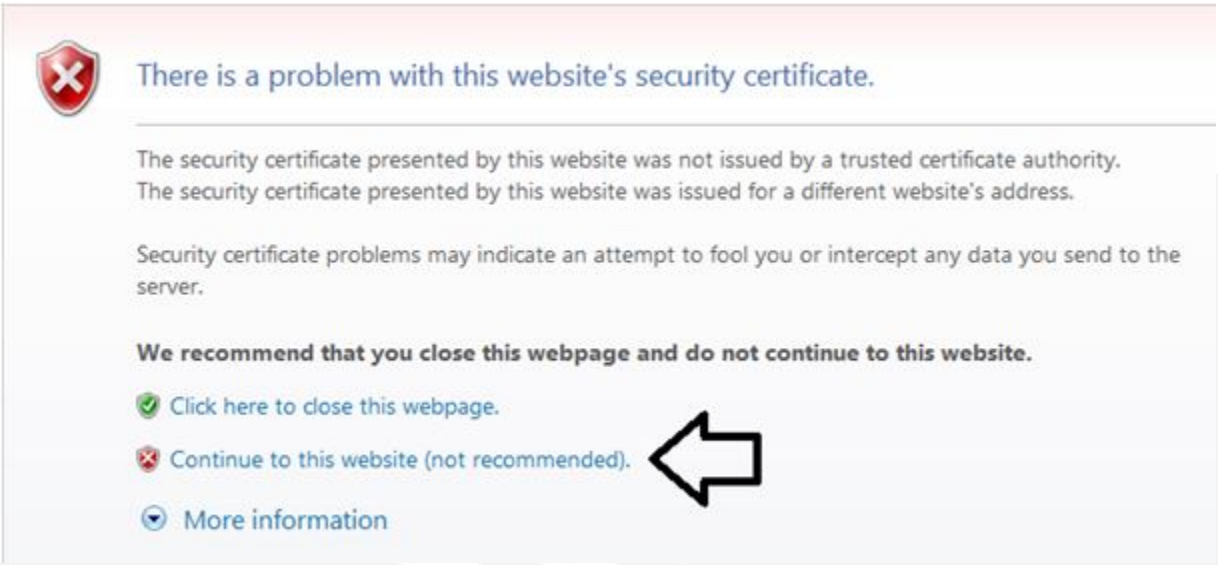


FIGURE 15. PROBLEM WITH WEBSITE SECURITY CERTIFICATE

6. If the screen above is displayed, select **Continue to this website** to display the login screen.
7. The login screen is displayed and the address bar changes to **https://** to indicate that SSL is enabled.

NOTICE
The address bar appears as shown below. This is expected and does not indicate a security threat.

FIGURE 16. HTTPS EXAMPLE

To disable SSL:

1. Select **Edit** from top menu bar to enable editing of the network settings fields.
2. Select the **Enable secure connection (SSL)** check box to remove check mark.
3. Select **Save**.

FIGURE 17. DISPLAY MIXED CONTENT

4. Select **Yes**.

5. Select **OK** when the Successful message is displayed.
6. The login screen is displayed and the address bar changes to **http://** indicating that SSL is disabled.

6.4 Modbus Settings

Modbus Settings allows the user to configure Modbus RTU settings and to enable or disable Modbus TCP. The following table shows the supported Modbus settings.

TABLE 3. SUPPORTED MODBUS SETTINGS

Setting	Setting Values
Baud Rate	2400 4800 9600 19200 38400
Stop Bit	1 2
Parity	None Even Odd

1. Select **Modbus Settings** on the Setup menu.

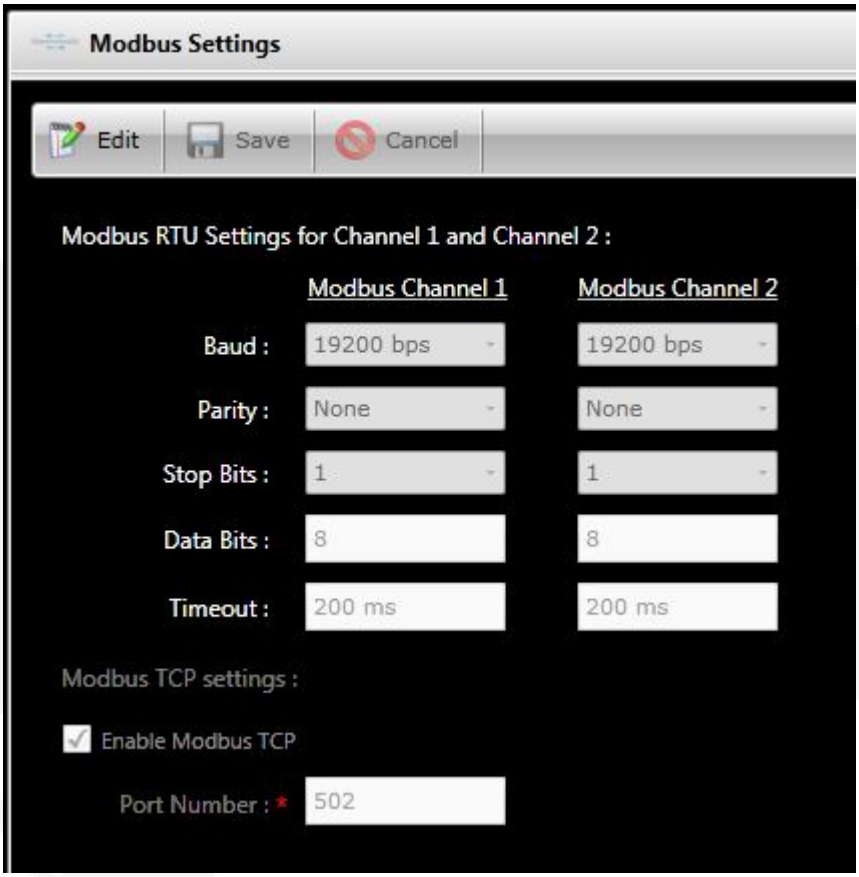


FIGURE 18. MODBUS SETTINGS

2. Verify the displayed settings. (The settings should match the Modbus settings of the devices that will be monitored.)
3. If the Modbus settings need to be changed, select **Edit** and modify the settings.
4. Select **Enable Modbus TCP** check box to enable or disable Modbus TCP. The default port is 502 but can be changed if required.
5. Select **Save**.

6.5 User Profile Settings

The user profile settings are used to enter user and user group information. Entered users are provided access to the PC500/550 system and can receive notification of events.

6.5.1 User Profile Settings - Users

The Users tab allows the user to add a new user, send a test email or SMS message, edit or delete user information, view user groups the user belongs to, and change a user's password.

Select **User Profile Settings** on the Setup menu and select the **Users** tab if it is not already selected.

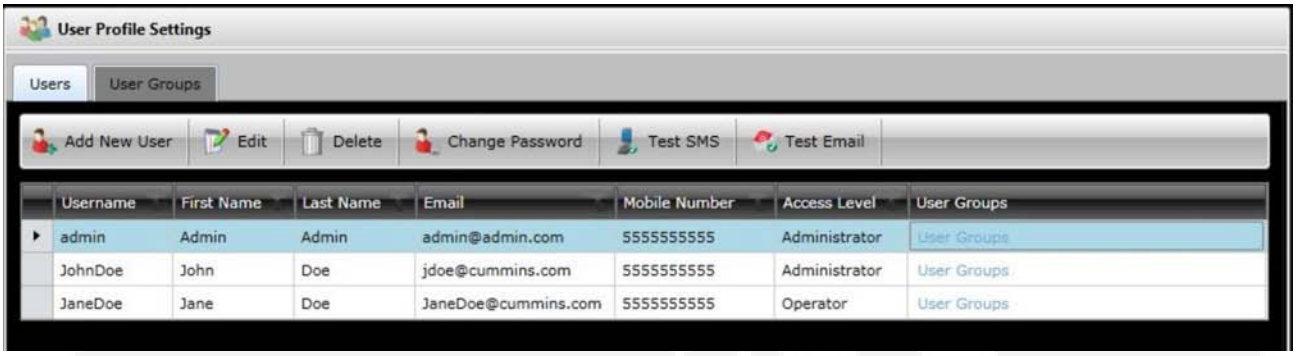


FIGURE 19. USER PROFILE SETTINGS - USERS

To add a new user:

1. Select **Add New User**.

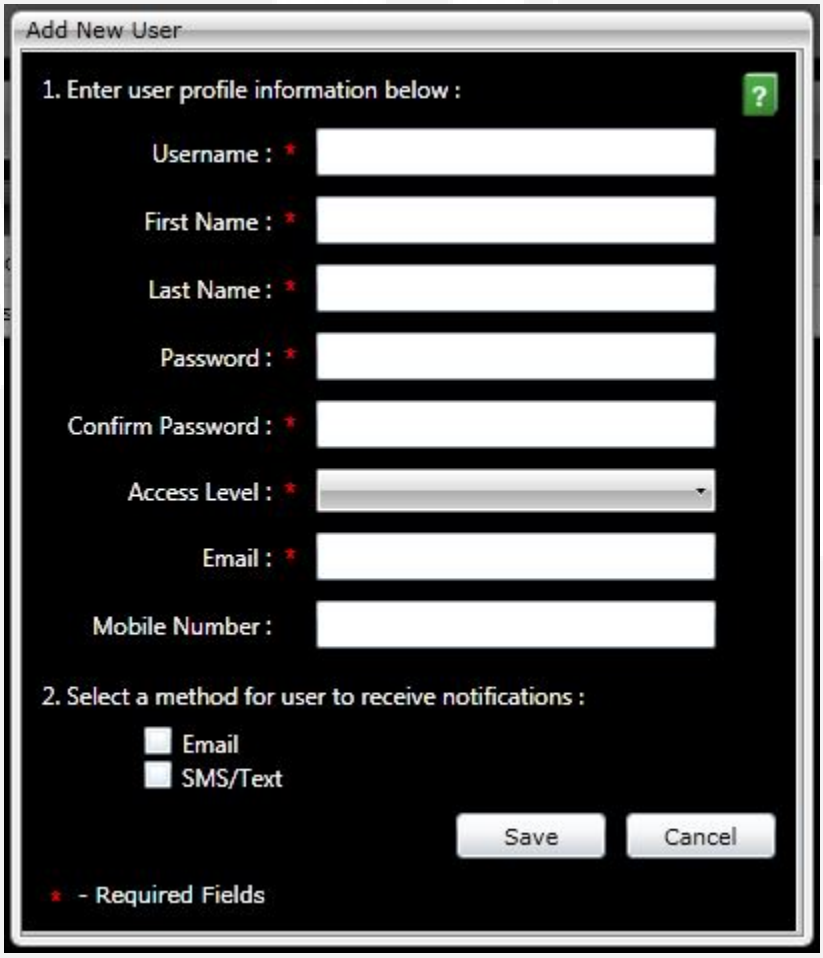


FIGURE 20. ADD NEW USER

2. Enter the Username, First Name, and Last Name for the user.
3. Enter the desired Password and Confirm Password.
4. Select the Access Level:
    - Administrator

- Operator
- Read Only

5. Enter the Email address and Mobile Number of the user.

NOTICE
A mobile number is required if the user wants to receive SMS text message notifications.

6. Select the method for the user to receive notification (Email, SMS/Text, or both)
7. Select **Save**.

To send a test email (Mail Settings must be configured first):

1. Select the user in the list to send the test email message to.
2. Select **Test Email**.

FIGURE 21. TEST EMAIL

3. The email of the user selected in the list is displayed in Email Address.

NOTICE
To send a test email to a different email address, edit the Email Address.

4. Select **Send**.

To send a test SMS (modem must first be activated):

1. Select the user in the list to send the test SMS message to.
2. Select **Test SMS**.

FIGURE 22. TEST SMS

3. The number of the user in the list is displayed in Mobile Number.

NOTICE
To send a test SMS to a different mobile number, edit the Mobile Number.

4. Select **Send**.

To edit an existing user's information, select the user from the list and select **Edit**.

To delete an existing user, select the user from the list and select **Delete**.

To view the groups a user belongs to, select **User Groups** link for the user in the list.

To change another user's password:

1. Select the user from the list and select **Change Password**.

FIGURE 23. CHANGE PASSWORD (USER)

2. Enter the new password and confirm.
3. Select **Save**.

The administrator cannot change his or her password from this screen. If Change Password is selected for the active admin user, the following message is shown. Follow the instructions in the message.

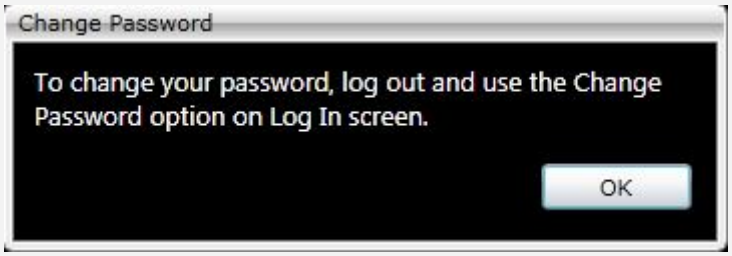


FIGURE 24. CHANGE PASSWORD (ADMIN)

6.5.2 User Profile Settings - User Groups

The Users Groups tab allows the user to add a new user group and select the users to add to the new group, to edit and delete users in a group, and to view all members of a group.

Select **User Profile Settings** on the Setup menu and select the **User Groups** tab if it is not already selected.

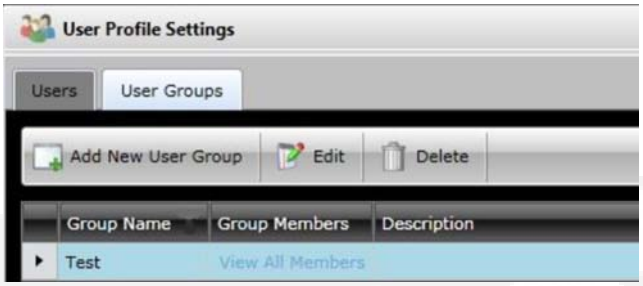


FIGURE 25. USER PROFILE SETTINGS - USER GROUPS

1. Select **Add New User Group**.

FIGURE 26. ADD NEW USER GROUP

2. Enter the name of the new group.
3. Enter a description of the group if desired.
4. Select the users that should be added to the group.
5. Select **Save**.

To edit an existing user group, select the user group from the list and select **Edit**.

To delete an existing user group, select the user group from the list and select **Delete**.

To view all the members of a group, select **View All Members** link for the group in the list.

6.6 Date and Time Settings

Date and time settings allow the user to manually select the date, time, and time zone; or enter time server information.

1. Select **Date and Time Settings** on the Setup menu.

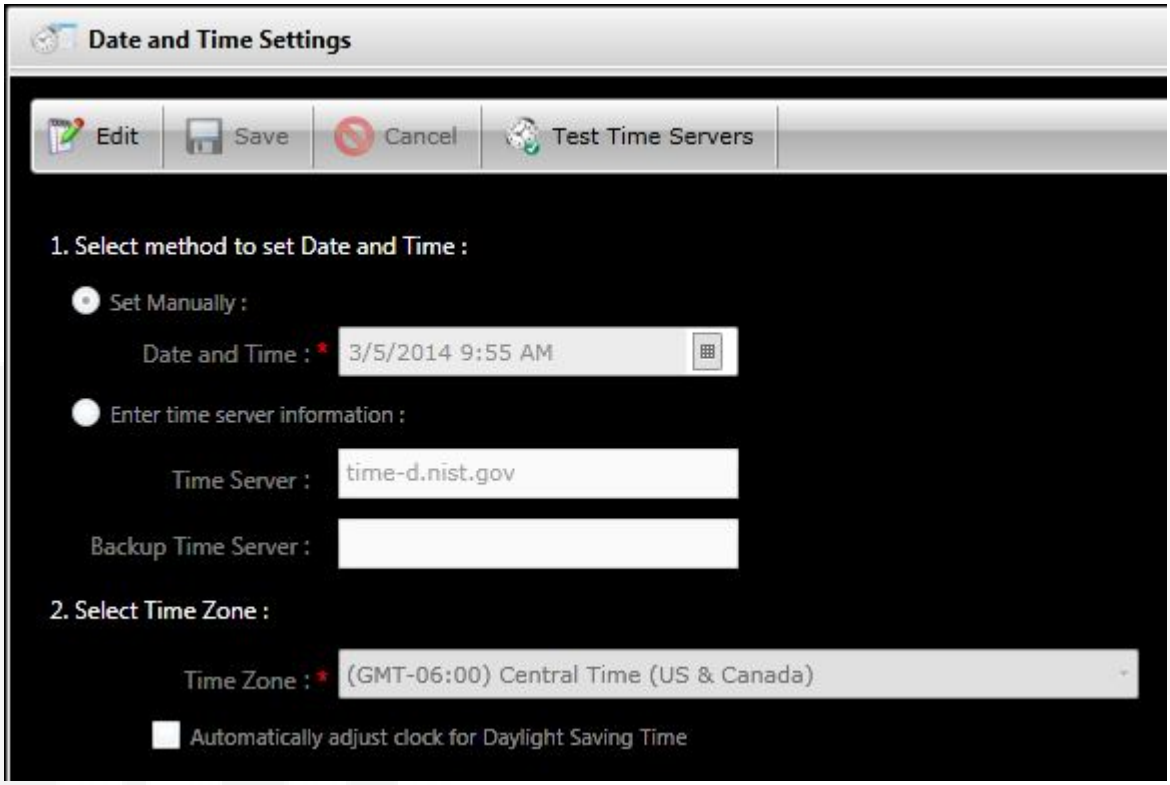


FIGURE 27. DATE AND TIME SETTINGS

2. Select **Edit** to modify the settings.
3. If entering the time zone, and date and time manually:
   a. Select the date and time from the calendar.
   b. Select the time zone.
4. If entering time server information:
   a. Enter the time server.
   b. Enter the backup time server if desired.
   c. Select the time zone.
5. Select **Save**.
6. If using Time Server, select **Test Time Servers** button to test time server(s) entered.

NOTICE
System Reboot is required when changing the date and time settings.

6.7 Device Configuration

Device Configuration is used to add, delete, and configure generator set, ATS, and I/O devices into the system. Only 3 AUX101/102 I/O devices can be configured. I/O devices provide expansion for sensors and output controls.

1. Select **Device Configuration** on the Setup menu.

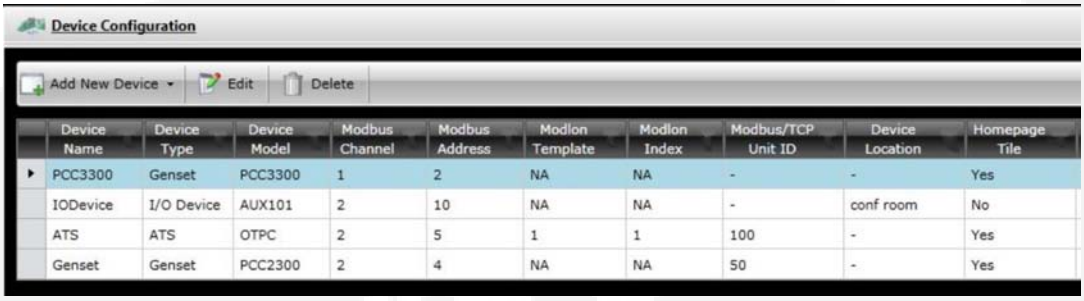


FIGURE 28. DEVICE CONFIGURATION

2. Select **Add New Device** and select the device type from the drop-down list.
   - Genset
   - ATS
   - I/O Device

To edit an existing device, select the device from the list and select **Edit**.

To delete an existing device, select the device from the list and select **Delete**.

6.7.1 Add New Device - Genset

LonWorks supported devices require conversion to Modbus before connecting to the PC500/550. Since Modbus requests are diverted to multiple devices via the same Modlon, the system allows duplicate IDs for Modlon supported devices. The devices are differentiated by template and index number. Generator set device models 2100, 3100, 3200, 3201, and CCM-G are Modlon supported devices. The following table shows the supported generator set templates and indexes.

TABLE 4. SUPPORTED GENERATOR SET MODLON TEMPLATES

Template	Supported Generator Sets	Index
1	5 Generator Sets	0–4
2	5 Generator Sets (with paralleling data)	0–4
3	10 Generator Sets	0–9

NOTICE

A Modlon Index is related to the generator set that was commissioned on the LonWorks database. For example, if Gen1 is commissioned on the LonWorks database, an index of 0 is associated with it. Gen2 is associated with index 1, and so on.

When devices are added to the system, a Modbus/TCP Unit Identifier can be assigned. The unit identifier is used for identifying devices connected on the Modbus RTU channel when establishing a Modbus TCP session. The PC500/550 metadata is accessed using device ID 100.

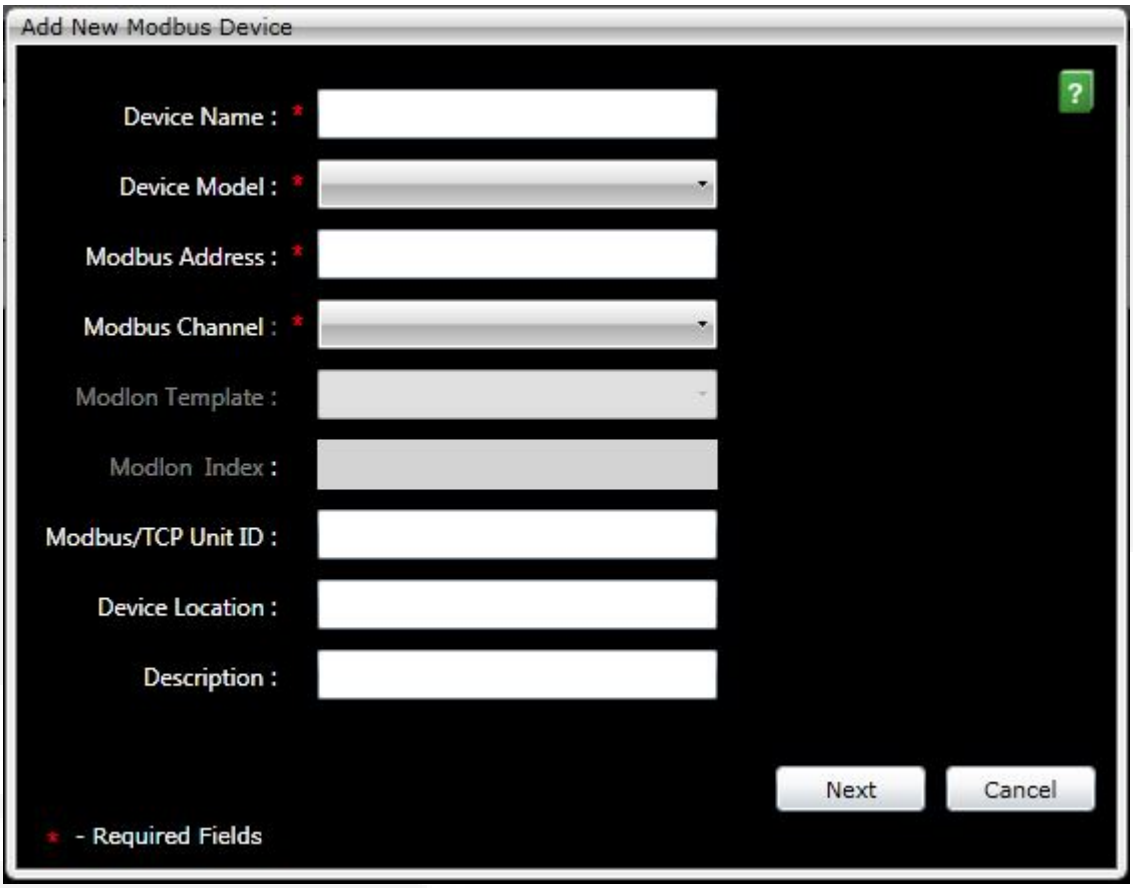


FIGURE 29. ADD NEW DEVICE - GENSET

To add a new generator set:

1. Enter the desired device name.
2. Select the Device Model from the drop-down list:
   - PCC3300
   - PCC2300
   - PCC1301
   - PCC1302
   - PCC2100
   - PCC3100
   - PCC3200
   - PCC3201
   - CCM-G
3. Enter the Modbus Address of the device.

4. Select the Modbus Channel from the drop-down list:
   - Channel-1
   - Channel-2
5. If the device model is 2100, 3100, 3200, 3201, or CCM-G; a Modlon template and index entry is required. Select the appropriate template (1, 2, 3) and enter the appropriate index number.
6. Enter a Modbus TCP/IP Unit ID if needed.
7. Enter a device location and description if desired.
8. Select **Next**.

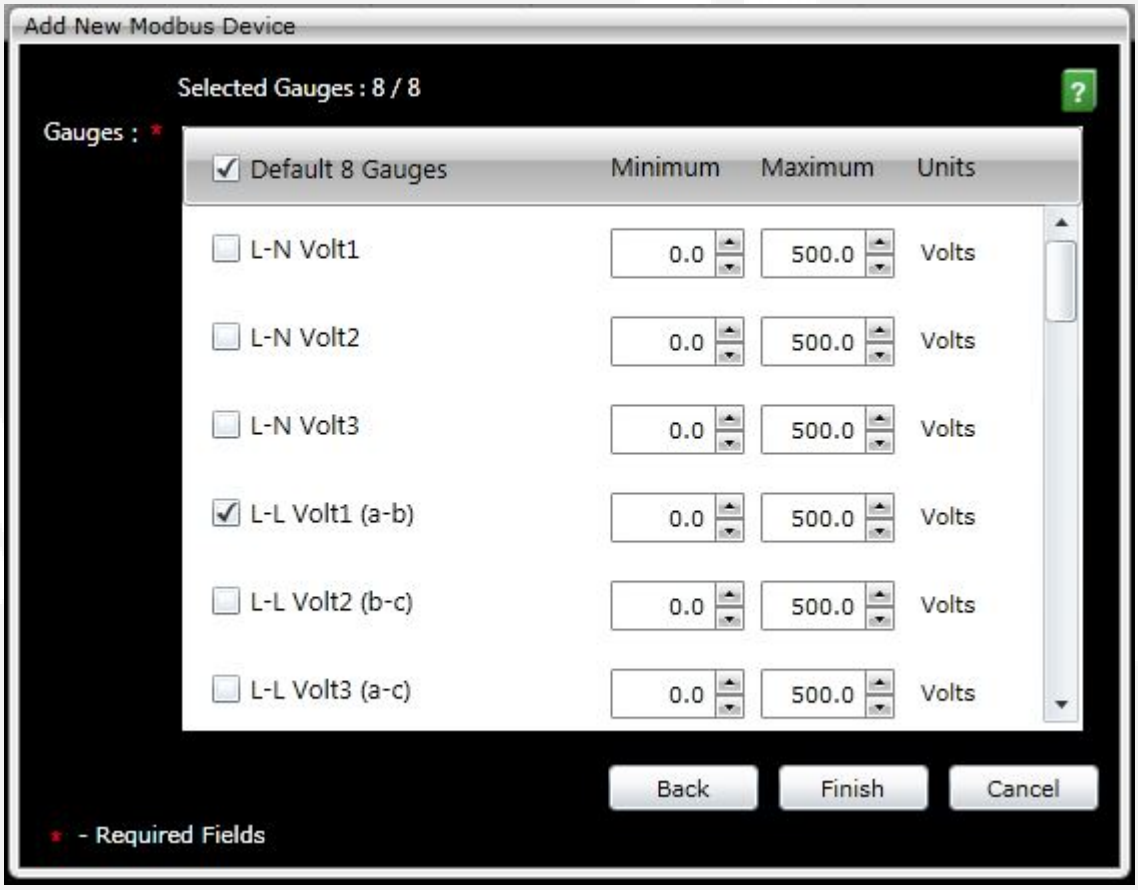


FIGURE 30. ADD NEW DEVICE - GENERATOR SET GAUGES

NOTICE
Use the scroll bar on the right side to view more gauge selections.

9. **Default 8 Gauges** is automatically selected. Leave as default or manually select the individual gauges from the list. The total number of gauges cannot exceed 8. The default gauges are:
   - L-L Volt1 (a-b)
   - Line Current 1

- Total kW
- Frequency
- Battery Voltage
- Oil Pressure
- Coolant Temperature
- Engine RPM

10. Select the up and down arrows, or manually enter a value, to change the minimum and maximum limits for the gauge.
11. Select **Finish** to save the changes. A new device tile is added to the device grid and Home page.

To quit without saving changes, select **Cancel**.

To go back to the previous screen, select **Back**.

6.7.2 Add New Device - ATS

ATSs are LonWorks supported devices that require conversion to Modbus before connecting to the PC500/550. Since Modbus requests are diverted to multiple devices via the same Modlon, the system allows duplicate IDs for Modlon supported devices. The devices are differentiated by template and index number. The following table shows the supported ATS templates and indexes.

TABLE 5. SUPPORTED GENERATOR SET MODLON TEMPLATES

Template	Supported ATSs	Index
1	5 ATSs	0–4
2	5 ATSs	0–4
4	10 ATSs	0–9

NOTICE

A Modlon Index is related to an ATS that was commissioned on the LonWorks database. For example, if ATS1 is commissioned on the LonWorks database, an index of 0 is associated with it. ATS2 is associated with index 1, and so on.

When devices are added to the system, a Modbus/TCP Unit Identifier can be assigned. The unit identifier is used for identifying devices connected on the Modbus RTU channel when establishing a Modbus TCP session. The PC500/550 metadata is accessed using device ID 100.

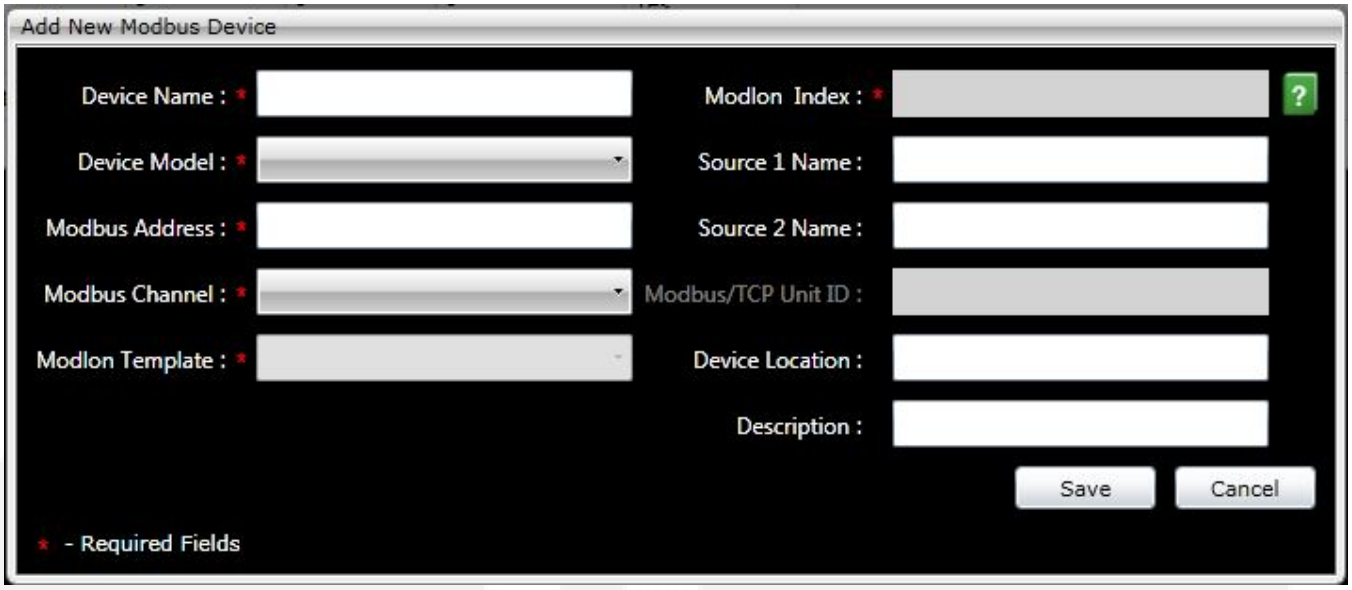


FIGURE 31. ADD NEW DEVICE - ATS

1. Enter the desired device name.
2. Select the Device Model from the drop-down list:
   - OTPC
   - OHPC
   - CHPC
   - BTPC
   - CCM-T
3. Enter the Modbus Address of the device.
4. Select the Modbus Channel from the drop-down list:
   - Channel-1
   - Channel-2
5. Select the appropriate Modlon template (1, 2, 4) and enter the appropriate index number.
6. Enter the Source 1 and Source 2 name if desired.
7. Enter a Modbus TCP/IP Unit ID if needed.
8. Enter a device location and description if desired.
9. Select **Save**. The new device tile is added to the device grid and Home page.

6.7.3 Add New Device - I/O Device

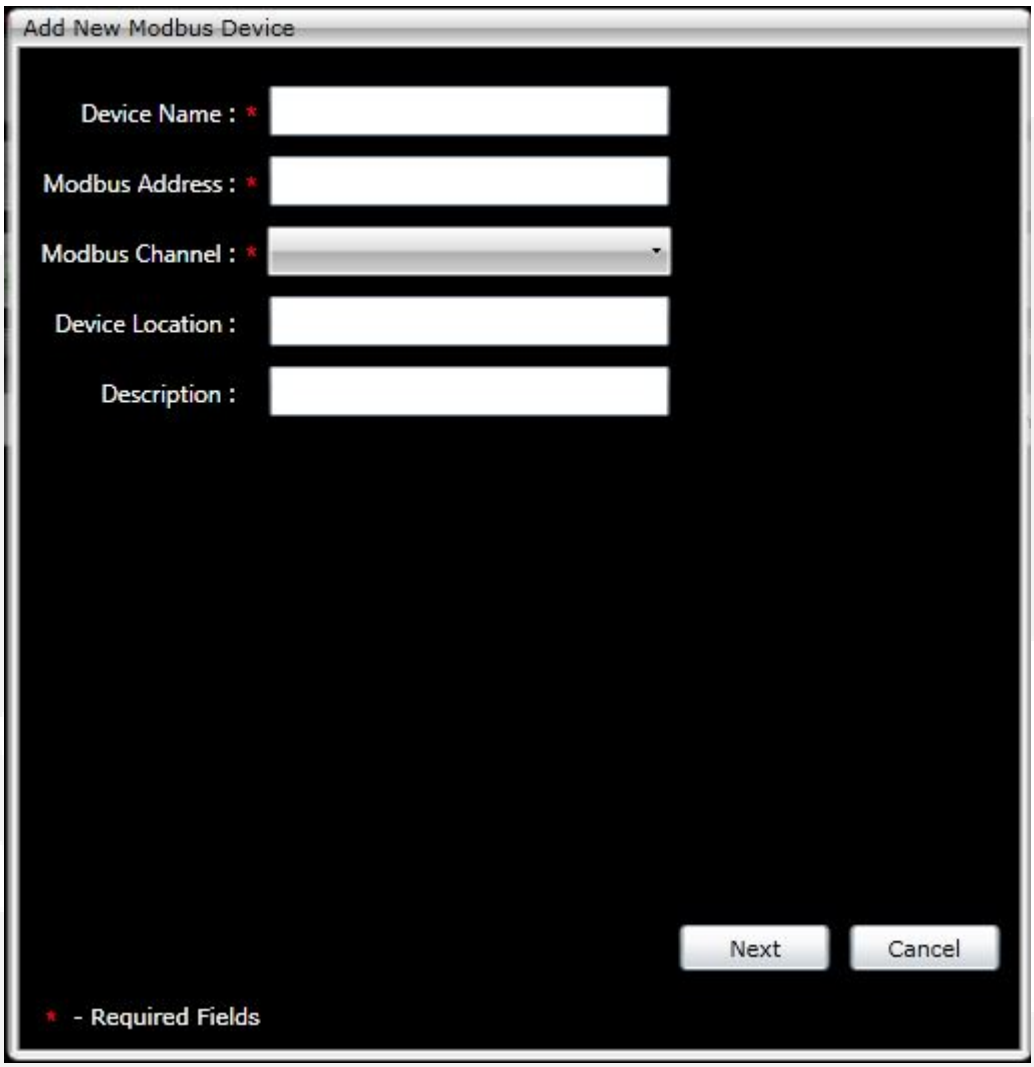


FIGURE 32. ADD NEW DEVICE - I/O DEVICE

To add a new AUX101/102:

1. Enter the desired device name.
2. Enter the Modbus Address of the device.
3. Select the Modbus Channel from the drop-down list.
   - Channel-1
   - Channel-2
4. Enter a device location and description if desired.
5. Select **Next**.

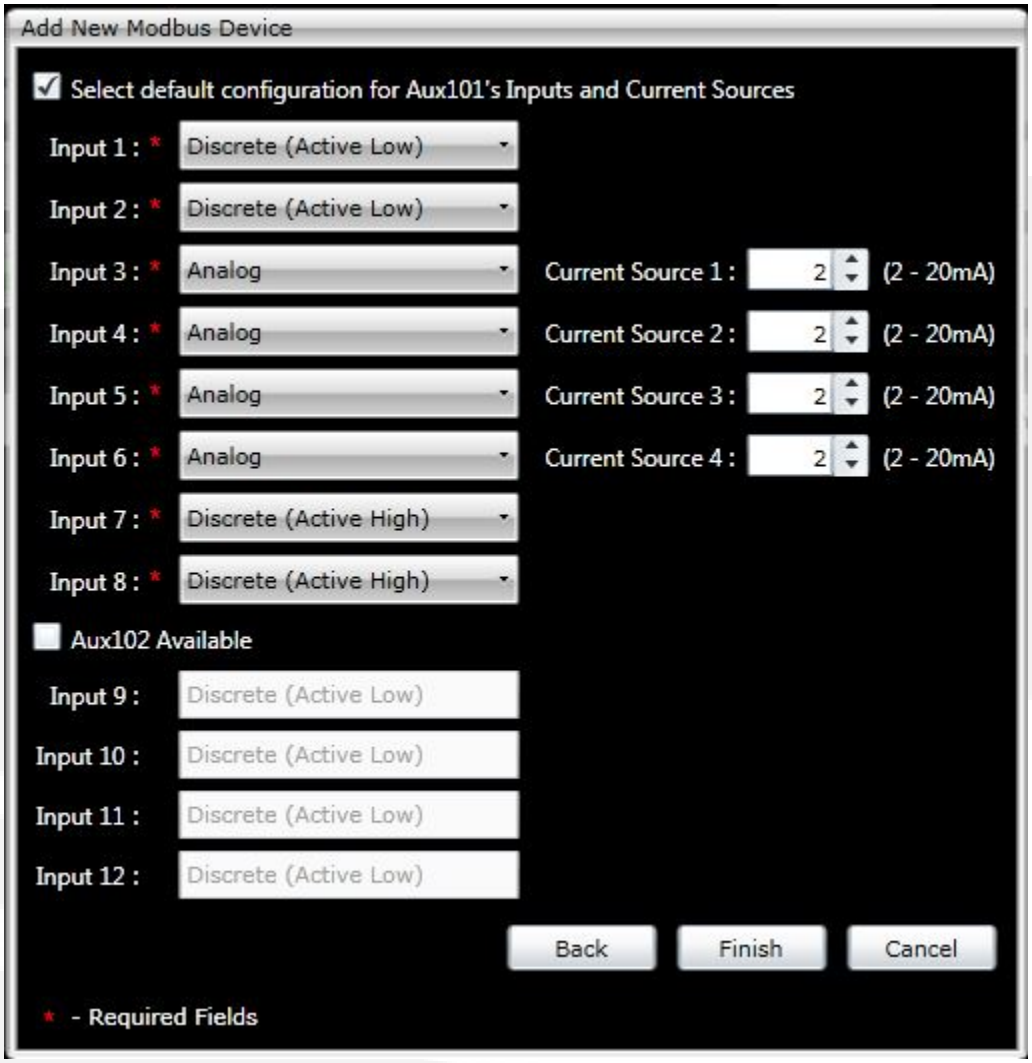


FIGURE 33. ADD NEW DEVICE - I/O DEVICE CONFIGURATION

6. Select the **Select default configuration for Aux101's Inputs and Current Sources** check box or manually configure Input 1 through Input 8. To manually configure an input, select the input type from the drop-down list.
   - Analog - Continuous voltage converted to a value.
   - Discrete (Active High) - Represents a binary digit of 1, or asserted state of a logical condition, by the higher of 2 voltages. Sensor becomes active when the signal is tied to B+.
   - Discrete (Active Low) - Represents a binary digit of 1, or asserted state of a logical condition, by the lower of 2 voltages. Sensor becomes active when the signal is grounded (B–).
7. For Analog inputs, configure the associated Current Source. Use the up and down arrows, or manually enter.
8. If the AUX101 includes an AUX102, select the **Aux102 Available** check box. AUX102 inputs are not configurable.
9. Select **Finish**.

To quit without saving changes, select **Cancel**.

To go back to the previous screen, select **Back**.

Add sensors and output control for the new I/O device using the Sensors and Output Control setup menu.

6.8 Sensors and Output Controls

Sensors and Output Controls are used to enter and edit sensor and output control information.

NOTICE
An AUX101/102 I/O device needs to be added before setting up AUX101/102 sensors and output controls.

6.8.1 Sensors and Output Controls - Sensors

1. Select **Sensors and Output Controls** on the Setup menu.
2. Select the **Sensors** tab if it is not already selected.

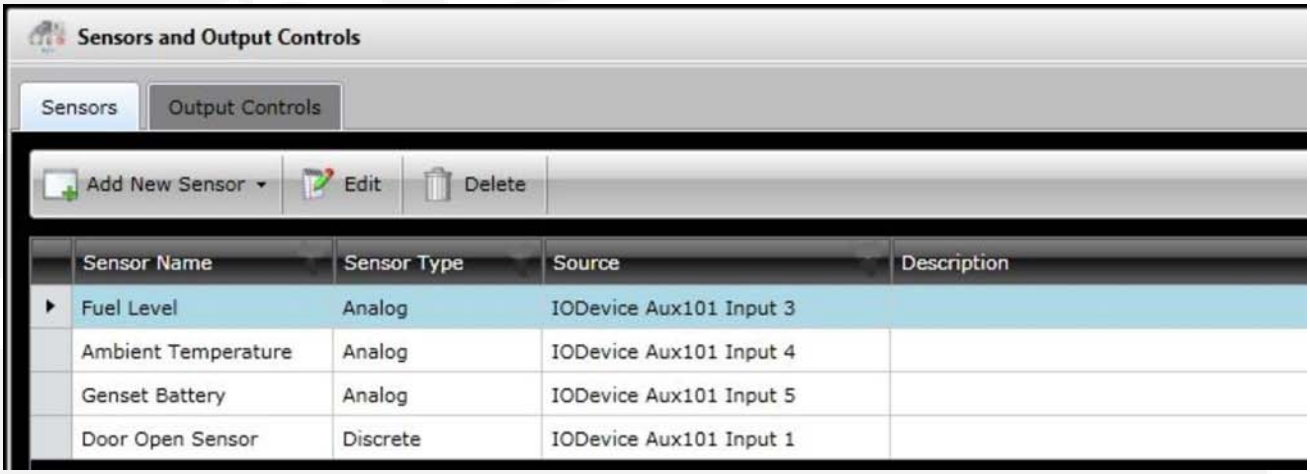


FIGURE 34. SENSORS AND OUTPUTS - SENSORS

3. To add a new sensor, select **Add New Sensor** and select the sensor type from the drop-down list.
    - Discrete
    - Analog

To edit an existing sensor, select the sensor from the list and select **Edit**.

To delete an existing sensor, select the sensor from the list and select **Delete**.

6.8.1.1 Add New Sensor - Discrete

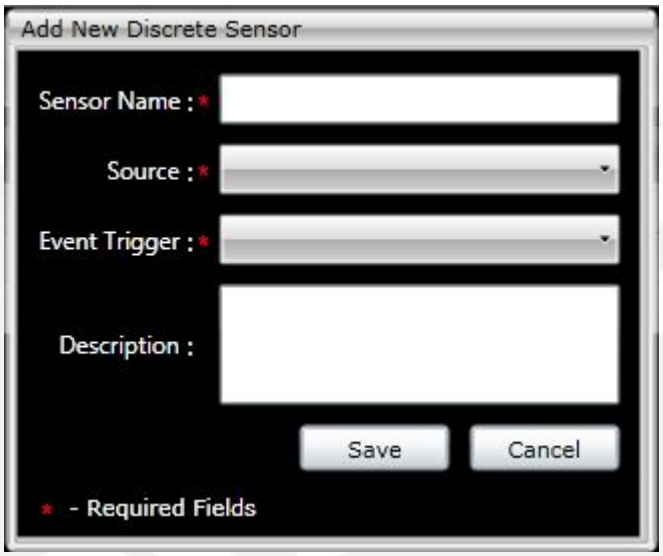


FIGURE 35. ADD NEW SENSOR - DISCRETE

1. Enter a Sensor Name.
2. Select the I/O Source from the drop-down list.
   - IODevice Aux101 Input 1
   - IODevice Aux101 Input 2
   - IODevice Aux101 Input 7
   - IODevice Aux101 Input 8
   - IODevice Aux102 Input 9
   - IODevice Aux102 Input 10
   - IODevice Aux102 Input 11
   - IODevice Aux102 Input 12
   - PC550 Discrete Input Pin A
   - PC550 Discrete Input Pin B

NOTICE
The drop-down list is populated only with the available inputs. If an AUX is not configured, only the PC500/550 inputs are listed. If an input is already in use, it is not shown in the list.

3. Select the Event Trigger from the drop-down list.
   - None (No event will be logged.)
   - Active (An event will be logged when the sensor state changes to active.)
   - Inactive (An event will be logged when the sensor state changes to inactive.)
   - State Change (An event will be logged when the sensor state changes to active or inactive.)

4. Enter a Description if desired.
5. Select **Save**. The newly added sensor is displayed in the sensor grid.

6.8.1.2 Add New Sensor - Analog

FIGURE 36. ADD NEW SENSOR - ANALOG

1. Enter a Sensor Name.
2. Select a sensor Type from the drop-down list:
   - Temperature
   - Pressure
   - Volume
   - Battery
3. Select the Units from the drop-down list. The units are based on the sensor type. The units should match the units from sensor specification sheet.

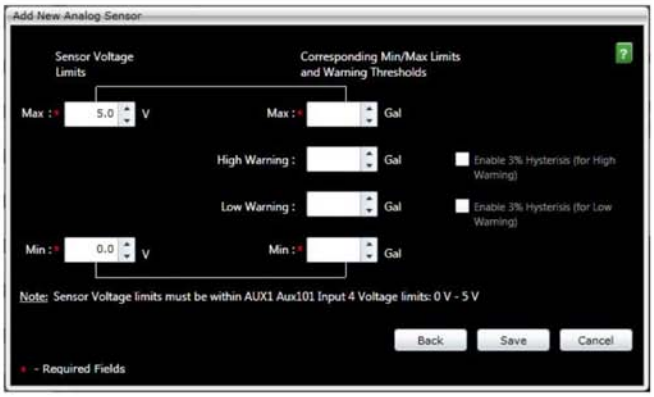
Sensor Type	Units
Temperature	degF degC
Pressure	psi kpa
Volume	Gal Ltr
Battery	Volt

4. Select the I/O Source from the drop-down list.
   - IODevice Aux101 Input 3
   - IODevice Aux101 Input 4
   - IODevice Aux101 Input 5
   - IODevice Aux101 Input 6
   - PC550 Analog Input Pin

NOTICE
The drop-down list is populated only with the available inputs. If an AUX is not configured, only the PC500/550 inputs are listed. If an input is already in use, it is not shown in the list.

5. Enter a Description if desired.
6. Select **Next**.

AUX101



PC550

FIGURE 37. ADD NEW SENSOR - ANALOG CONVERSION TABLE

7. Update the Max and Min voltage if desired (use up and down arrows, or manually enter).
8. Enter the Max and Min units (use up and down arrows, or manually enter).
9. Enter the High Warning and Low Warning values as needed (use up and down arrows, or manually enter).
10. Select **Save** to save the changes. The newly added sensor is displayed in the sensor grid.

To quit without saving changes, select **Cancel**.

To go back to the previous screen, select **Back**.

6.8.2 Sensors and Output Controls - Output Controls

1. Select **Sensors and Output Controls** on the Setup menu.
2. Select the **Output Controls** tab if it is not already selected.

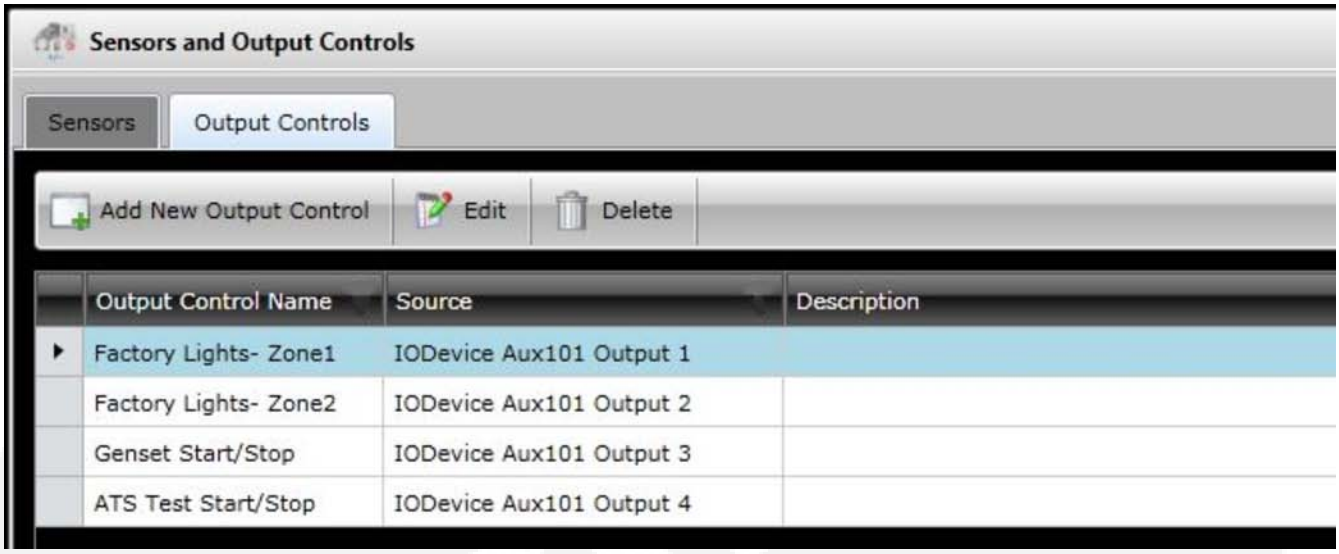


FIGURE 38. SENSORS AND OUTPUT CONTROLS - OUTPUT CONTROLS

3. Select **Add New Output Control**.

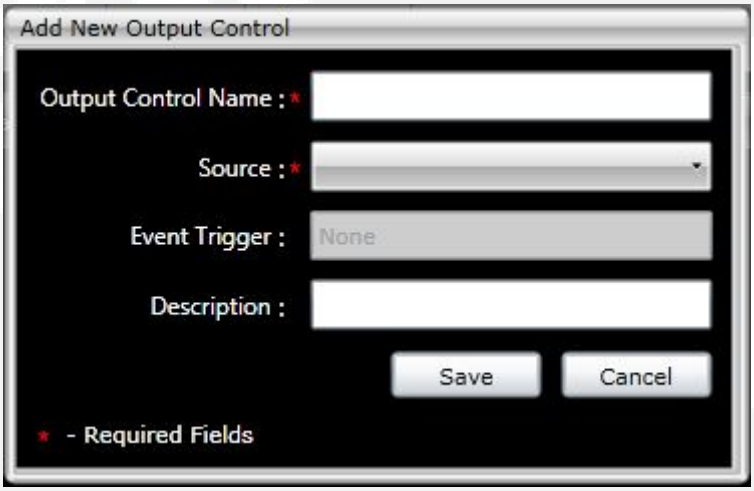


FIGURE 39. ADD NEW OUTPUT CONTROL

4. Enter the Output Control Name.
5. Select the Source from the drop-down list.
    - IODevice Aux101 Output 1
    - IODevice Aux101 Output 2
    - IODevice Aux101 Output 3
    - IODevice Aux101 Output 4
    - IODevice Aux101 Output 5
    - IODevice Aux101 Output 6
    - IODevice Aux101 Output 7
    - IODevice Aux101 Output 8
    - PC550 Discrete Output Pin A

- PC550 Discrete Output Pin B

NOTICE
The drop-down list is populated only with the available outputs. If an AUX is not configured, only the PC500/550 outputs are listed. If an output is already in use, it is not shown in the list.

NOTICE
Output control events are not logged.

6. Enter a Description if desired.
7. Select **Save**. The newly added output control is displayed in the sensor grid.

To edit an existing output control, select the output control from the list and select **Edit**.

To delete an existing output control, select the output control from the list and select **Delete**.

6.9 Mail Settings

Mail settings are required to enable the PC500/550 to send email messages through network connection.

1. Select **Mail Settings** on the Setup menu.

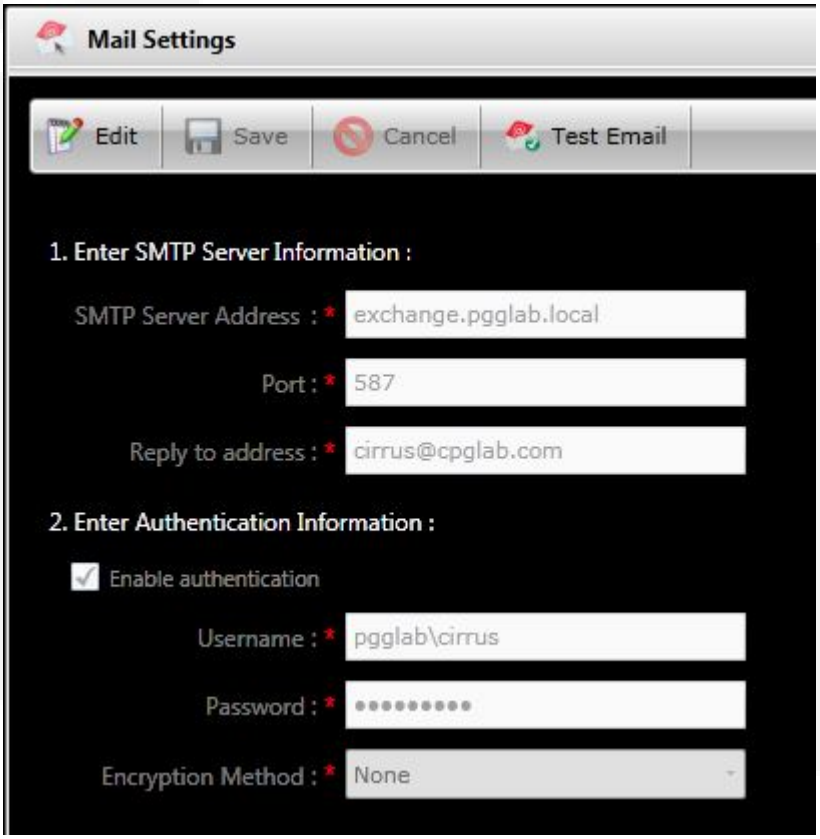


FIGURE 40. MAIL SETTINGS

2. Select **Edit** to modify the settings.
3. Enter the required SMTP server information.
4. If authentication is required, select the **Enable Authentication Information** check box and enter the username, password, and encryption method (None, SSL, TLS).
5. Select **Save**.
6. Select **Test Email** to send a test email message if desired.

6.10 Notifications

Notifications are sent to configured user groups (email, SMS, or both) to alert them when an event becomes active on the system.

NOTICE
At least one user group and one device must be configured to add a notification.

Select **Notifications** on the Setup menu.

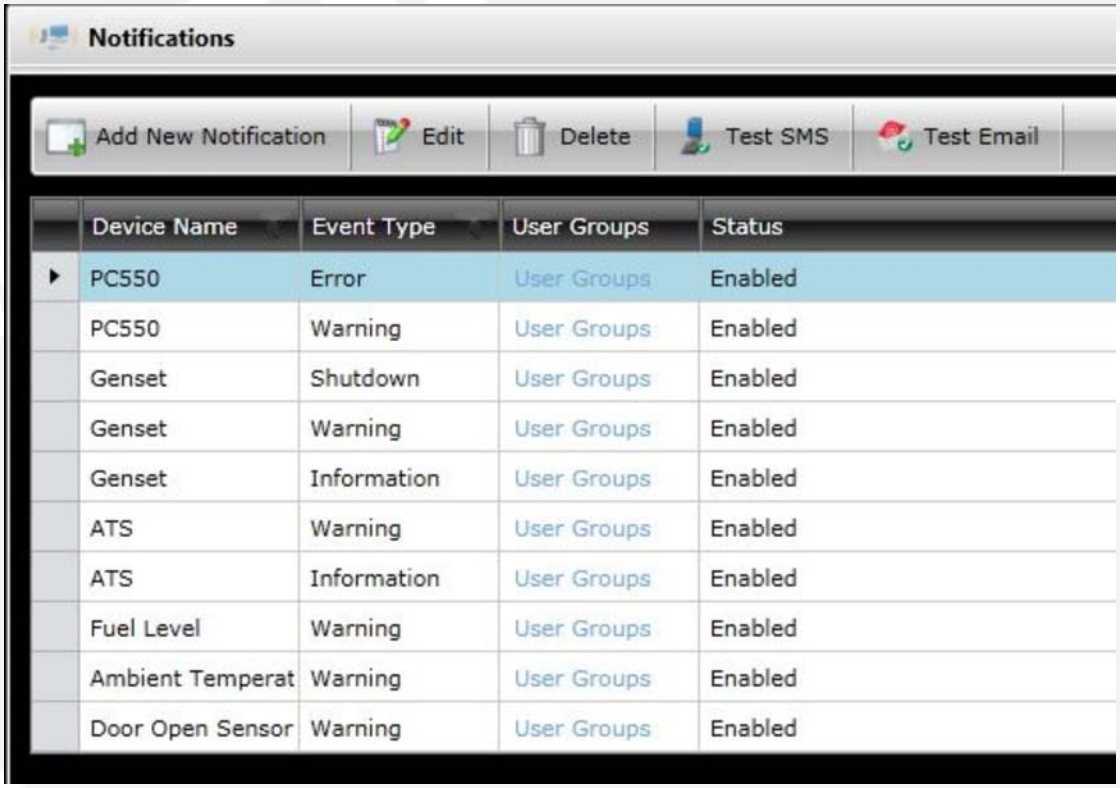
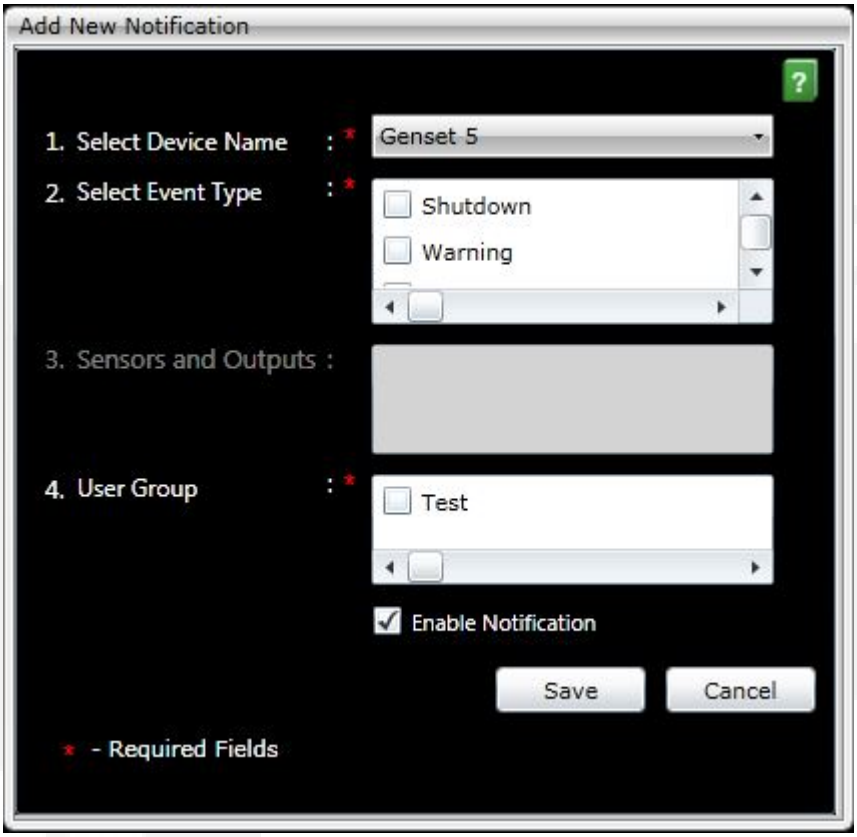


FIGURE 41. NOTIFICATIONS

To add a new notification:

1. Select **Add New Notification**.



2. Select the Device Name to configure the notification for from the drop-down list.
3. Select the Event Type. The options change depending on the selected device type.

Device Type	Event Type Options
PC500/550	Error, Warning, Information
Generator Set	Shutdown, Warning, Information
ATS	Warning, Information
Site I/Os	Warning (pre-selected)

4. If a Site I/O device type is selected, select the sensor(s) to apply to the notification.
5. Select the User Group to receive the notification.
6. Make sure that the **Enable Notification** check box is selected to enable the notification.
7. Select **Save**.

To send a test SMS (modem must first be activated):

1. Select **Test SMS**.

FIGURE 42. TEST SMS

2. Enter the Mobile Number of the user that message should be sent to.
3. Select **Send**.

To send a test email (Mail Settings must be configured first):

1. Select **Test Email**.

FIGURE 43. TEST EMAIL

2. Enter the Email Address of the user that message should be sent to.
3. Select **Send**.

To view user groups for a notification, select **User Groups** link.

To edit an existing notification, select the notification from the list and select **Edit**.

To delete an existing notification, select the notification from the list and select **Delete**.

6.11 SNMP Server Settings

The default setting for SNMP traps is Disabled. To enable SNMP traps, select an SNMP and enter the SNMP server settings. When enabled, traps are sent to the network management system for every event that becomes active in the system.

1. Select **SNMP Server Settings** on the Setup menu.

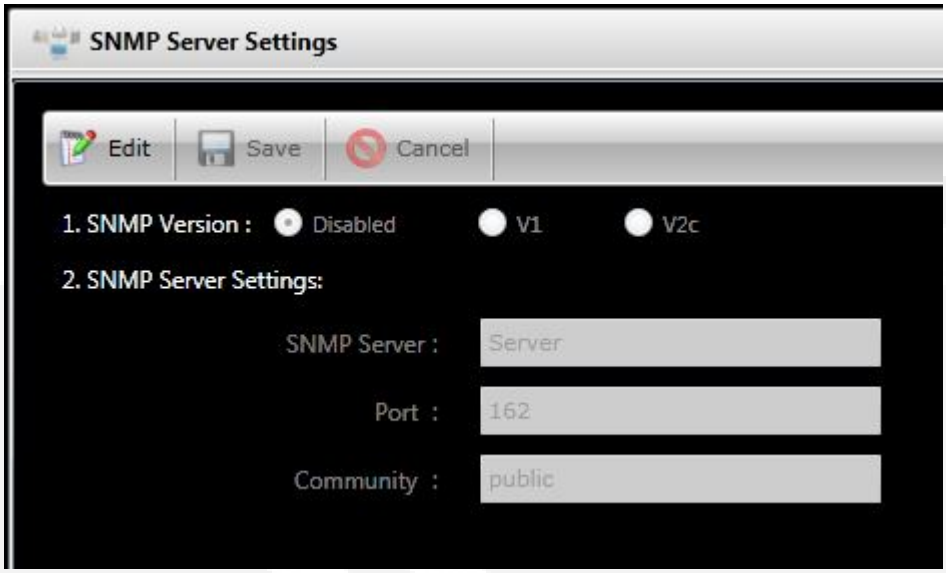


FIGURE 44. SNMP SERVER SETTINGS

2. Select **Edit**.
3. Select the SNMP version, **V1** or **V2c**.
4. Enter the SNMP Server, Port, and Community.
5. Select **Save**.

6.12 Data Log Preferences

Data Log Preferences allows the user to select where to store the data log (internal storage, USB storage, SD storage). Data Log Preferences also allows the user to select separate data logging time intervals for a Running Genset, Stopped Genset, ATS, and Sensors.

If an external memory storage device is removed while in use, the PC500/550 triggers a warning and all data is lost until the storage device is reinserted.

NOTICE
If the memory device for data storage is changed, the PC500/550 starts logging data in a new database. If the memory device is changed back, all previous data stored on the device is lost. For example, if the data is being stored on an SD card and the memory device is changed to Internal Storage causing the data to be stored internally, changing the memory device back to the SD card causes all previously stored data on the SD card to be lost.

1. Select **Data Log Preferences** on the Setup menu.

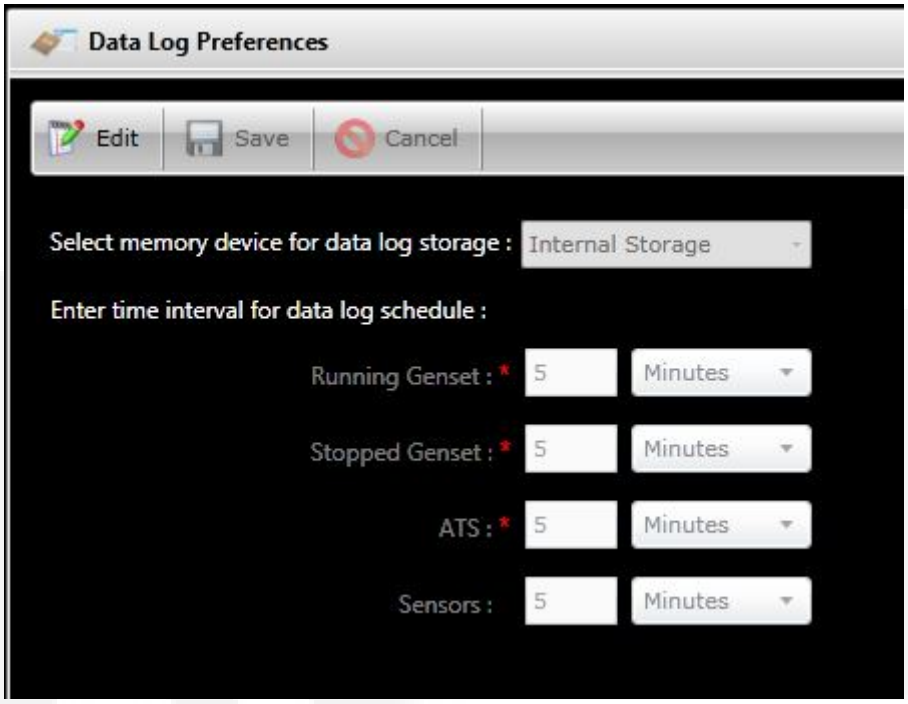


FIGURE 45. DATA LOG PREFERENCES

2. Select **Edit**.
3. Select a memory device.
   - Internal Storage
   - USB Storage
   - SD Storage

NOTICE
If USB or SD storage is selected, make sure that the external device is inserted into the PC500/550.

4. Enter the number of Minutes, Hours, or Days for the data to be logged.
5. Select **Save**.

6.13 Contacts

Contacts provides a useful place to store service contacts.

Select **Contacts** on the Setup menu.

To add a new contact:

1. Select **Add New Contact**.

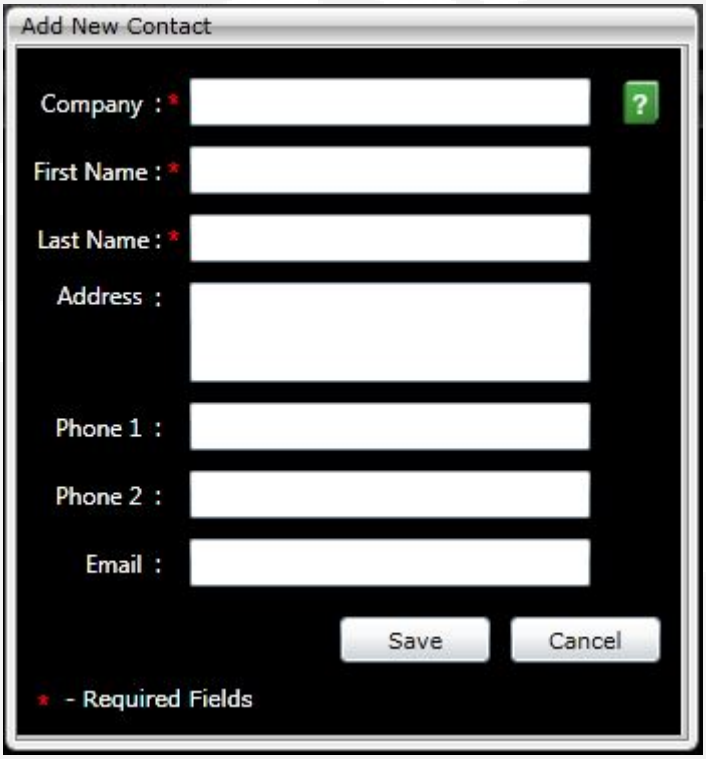


FIGURE 46. ADD NEW CONTACT

2. Enter the required information.
3. Select **Save**.

To edit an existing contact, select the contact from the list and select **Edit**.

To delete an existing contact, select the contact from the list and select **Delete**.

To view contact details:

1. Select the **View** link under the Details column.

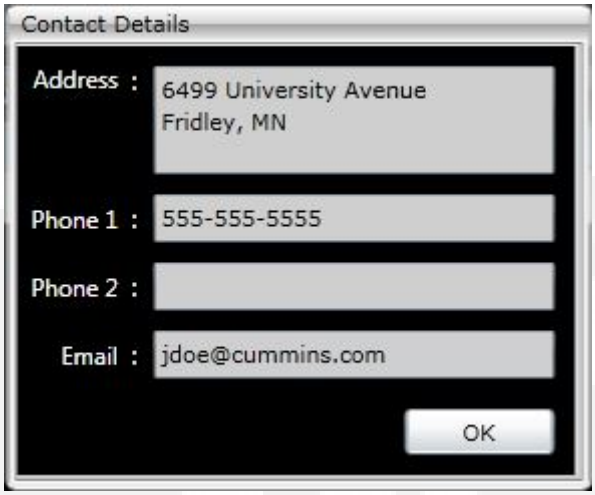


FIGURE 47. CONTACT DETAILS

2. Select **OK** when done viewing.

6.14 System Settings

System Settings allows the user to select the preferred system of measurement, set the inactive session timeout, set the GSM frequency band (GSM option only), and to change the user interface launguage. System Settings also provides the capability for the user to update software, export and import system configuration settings, and activate the CDMA modem (CDMA option only).

Select **System Settings** on the Setup menu.

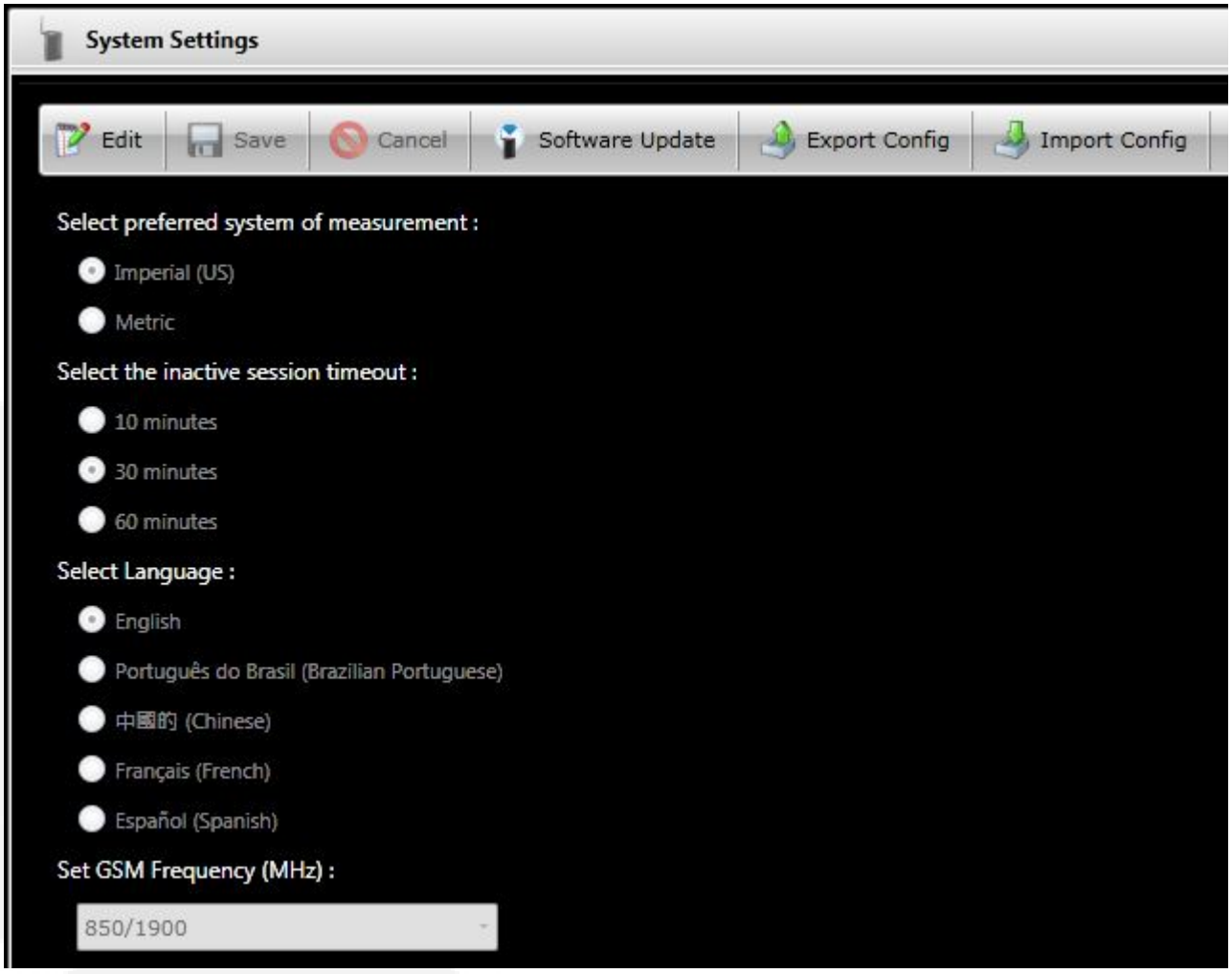


FIGURE 48. SYSTEM SETTINGS (GSM OPTION)

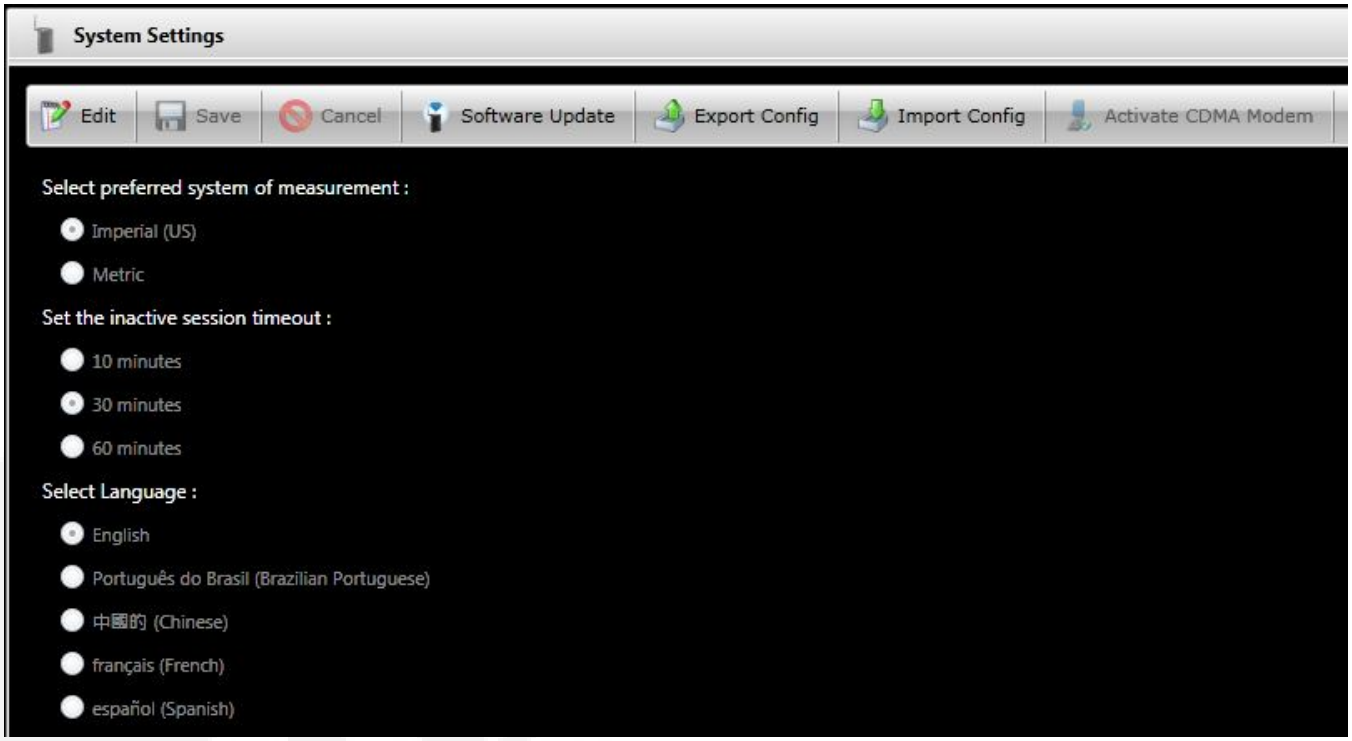


FIGURE 49. SYSTEM SETTINGS (CDMA OPTION)

To edit the preferred system of measurement:

1. Select **Edit**.
2. Select the preferred system of measurement.
3. Select **Save**.

To edit the inactive session timeout:

1. Select **Edit**.
2. Select the inactive session timeout.
3. Select **Save**.

To change the user interface language:

1. Select **Edit**.
2. Select the language.
3. Select **Save**.

To set the GMS frequency:

1. Select **Edit**.
2. Enter the GSM Frequency setting.
3. Select **Save**.

To cancel edits, select **Cancel**.

To update the software:

1. Select **Software Update**.

FIGURE 50. UPDATING STATUS

2. If you want to proceed, select **OK**. A browser window is displayed to select the software update firmware zip file.

⚠ CAUTION
Uploading a bad or inadequate zip file can cause permanent damage to the PC500/550. Make sure to upload the correct zip file.

To save the current configuration as a backup, select **Export Config**. A browser window is displayed to select the location to save the configured zip file.

To import a saved configuration file:

1. Select **Import Config**.

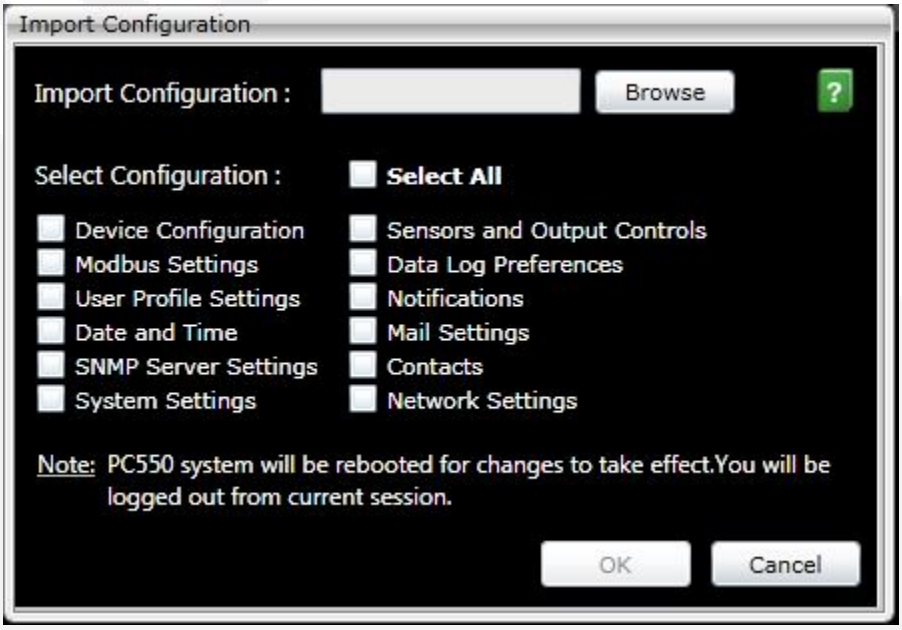


FIGURE 51. IMPORT CONFIGURATION

2. Select **Browse**. A browser window is displayed to select the configuration XML file.
3. Select the configuration to import.
4. Select **OK**.

To activate the CDMA modem, select **Activate CDMA**.

7 Operation

7.1 Home Page Dashboard Screen

Before any devices are configured, the Home Page dashboard screen appears as shown.

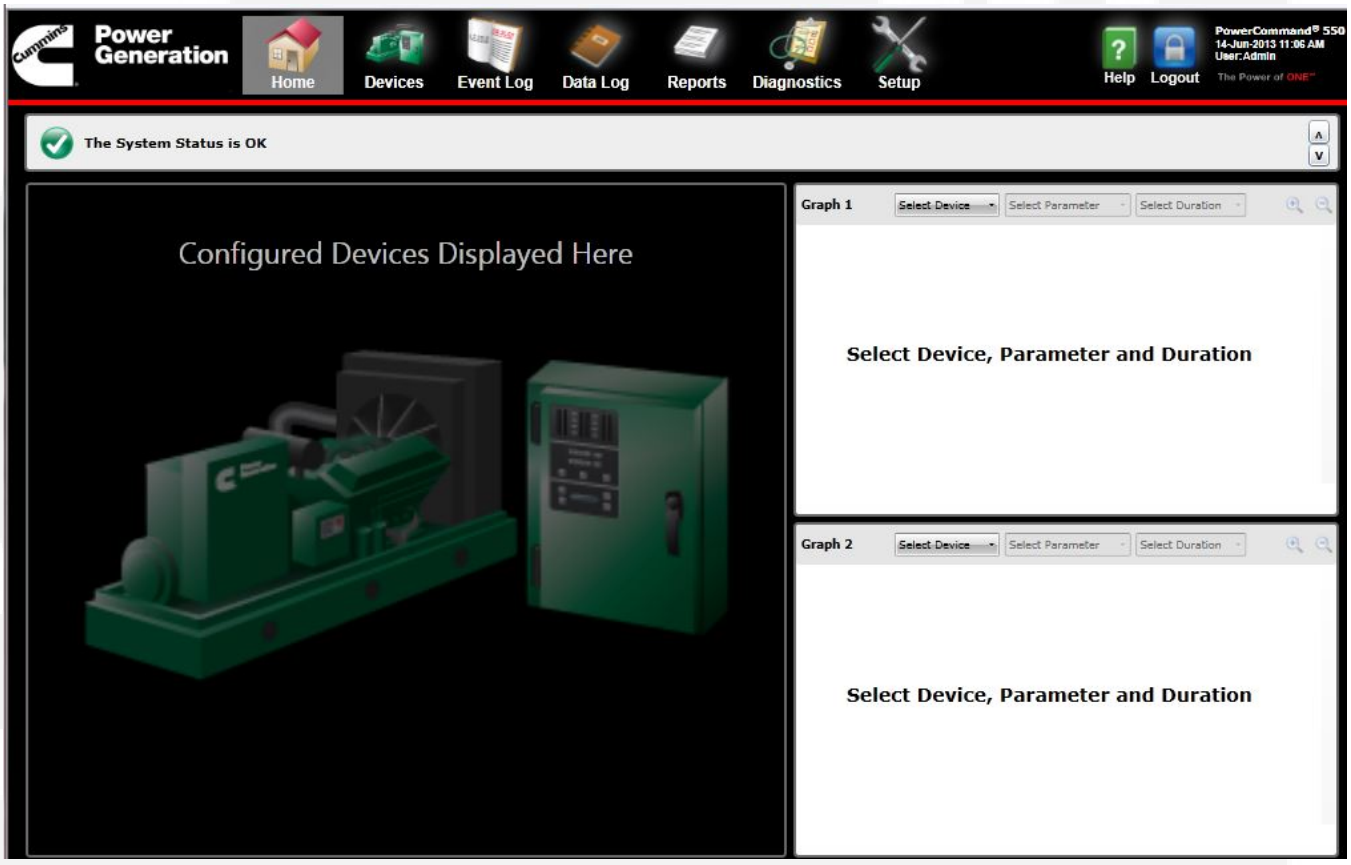


FIGURE 52. HOME PAGE DASHBOARD SCREEN

7.2 Menu Bar

The Menu Bar is displayed at the top of every page.

FIGURE 53. MENU BAR

The Menu Bar provides navigation to the following pages:

- Devices
- Event Log
- Data Log

- Reports
- Diagnostics
- Setup

The **Help** button provides access to the system help files.

The **Logout** button logs the user out of the User Interface.

The right side of the Menu Bar displays:

- Product Model
- Current date and time
- User that is currently logged onto the system

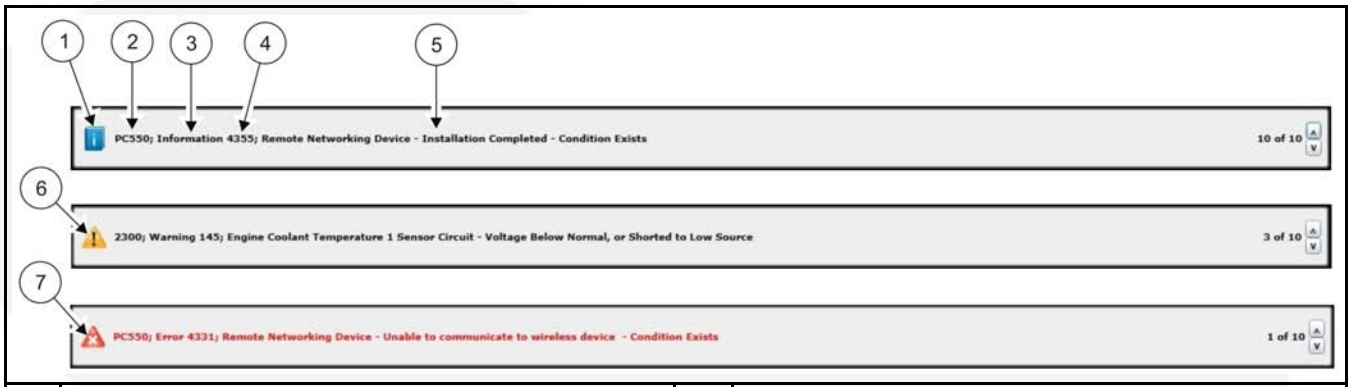
7.3 System Status Bar

The System Status Bar is displayed on every page under the Menu Bar. It displays information, warning, and error messages. The fault icon, source (device name) of the event, event type, fault event code, and description are displayed in each message. Messages are displayed as they occur. The order number and total number of messages are displayed on the right side of the status bar. The up and down arrows allow the operator to cycle through the messages.

Clicking on the System Status Bar causes the Event Log to be displayed.

When there are no fault messages, the following message is displayed.

FIGURE 54. SYSTEM STATUS OK



No.	Description	No.	Description
1	Information Fault Icon	5	Event Description
2	Source (Device Name)	6	Warning Fault Icon
3	Event Type	7	Error Fault Icon
4	Event Code		

FIGURE 55. SYSTEM STATUS MESSAGE EXAMPLES

7.4 Home Page

The Home Page is the first page displayed when a user logs in. When devices are configured into the system, the Home Page displays a dashboard showing device status and information and allows for device parameter graphs to be shown on the right side.

FIGURE 56. HOME PAGE

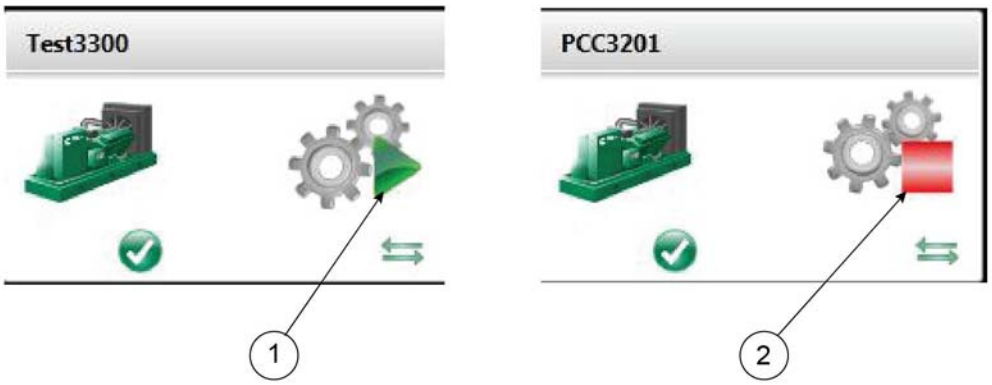
7.4.1 Device Dashboard

The device dashboard displays device status and information for each device being monitored. An image of each device

is displayed, along with its running, fault, and communication statuses. Hovering the cursor over an image displays the text associated with the image.

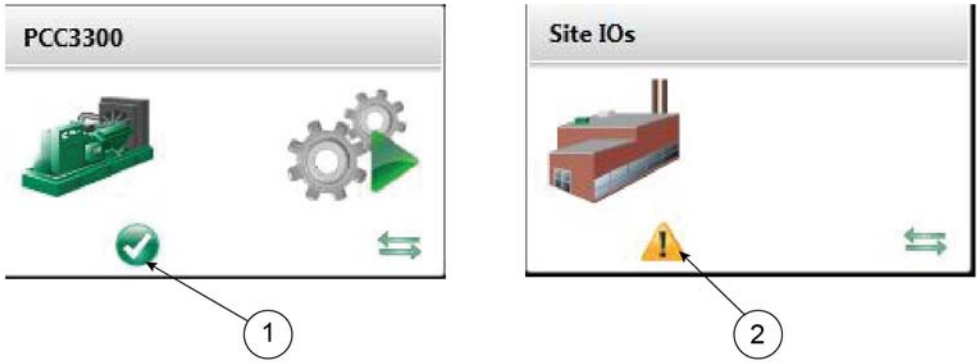
Hovering the cursor over a generator set device image displays alternator details. Hovering the cursor over an ATS device image displays source 1, source 2, and load details. Hovering the cursor over the Site IOs image displays the number of configured sensors, output controls, and active warnings.

Selection of a device navigates the user to the device details page.



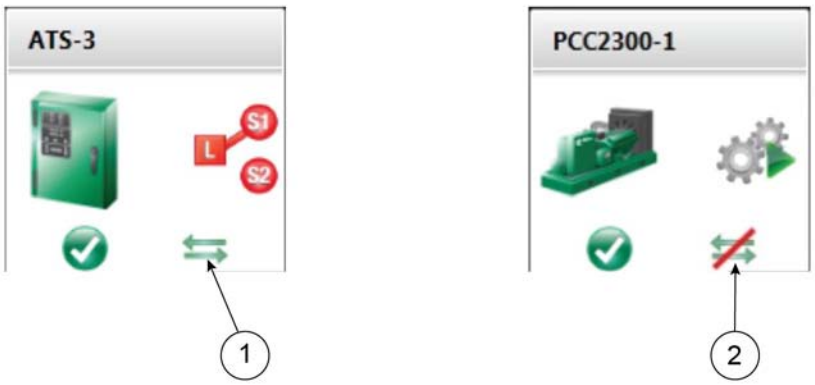
No.	Description	No.	Description
1	Running	2	Stopped

FIGURE 57. RUNNING STATUS



No.	Description	No.	Description
1	Normal	2	Warning

FIGURE 58. FAULT STATUS



No.	Description	No.	Description
1	Communicating	2	Not Communicating

FIGURE 59. COMMUNICATION STATUS

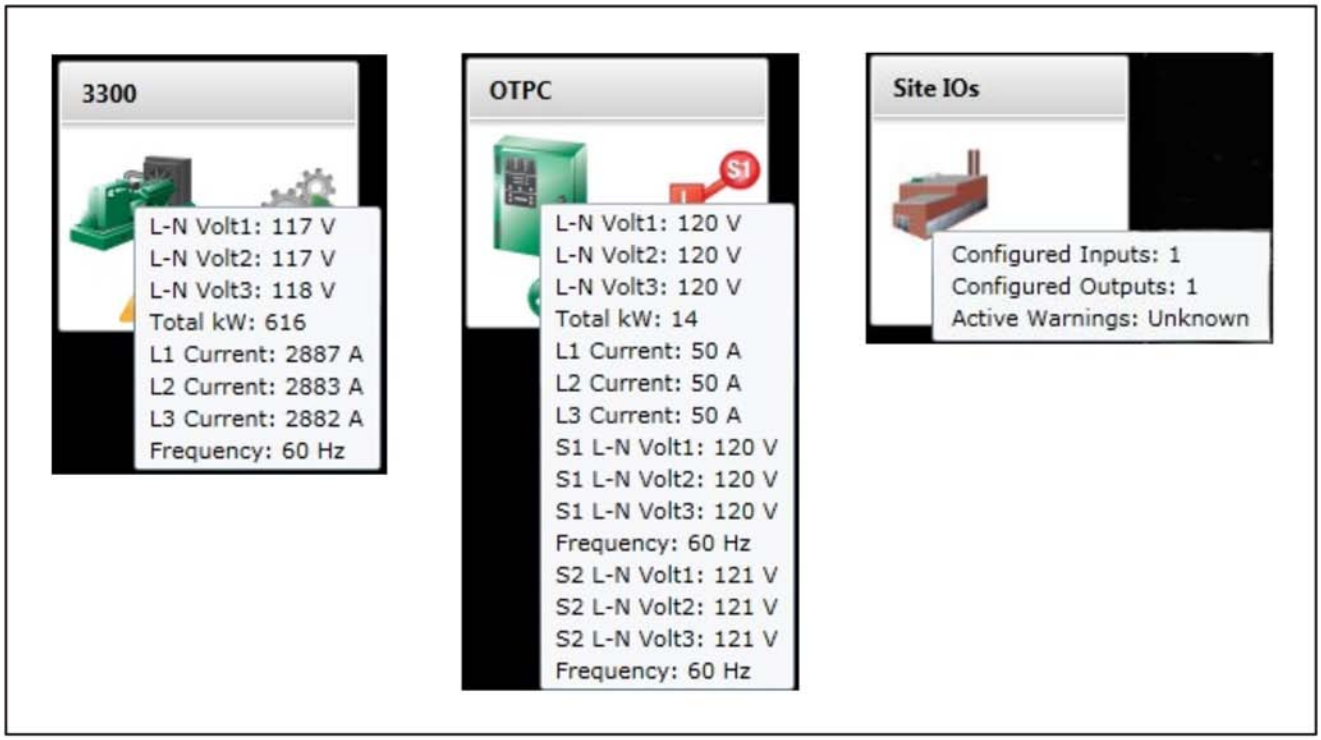


FIGURE 60. DEVICE INFORMATION

7.4.2 Device Parameter Graphs

Two graphs can be displayed on the Home Page. A graph can be generated for any configured device's parameter for a selected duration.

The parameters that are selectable for generator sets and ATSs are shown in the table below. The parameters for Site IOs are the sensors entered into the system.

NOTICE
The generator set parameters depend on the type of generator set control. Some parameters may be not be available.

TABLE 6. GENERATOR SET AND ATS PARAMETERS

Generator Set	ATS
Engine RPM	Total kW (kW)
Coolant Temp (F)	Total Power Factor
Oil Pressure (psi)	Total kVA (kVA)
Battery Voltage	Total kVAR (kVAR)
L-L Volt1 (a-b) (V)	L-L Volt1 (a-b) (V)
L-L Volt2 (b-c) (V)	L-L Volt2 (b-c) (V)
L-L Volt3 (a-c) (V)	L-L Volt3 (a-c) (V)
Frequency	Line Current1
Line Current1	Line Current2
Line Current2	Line Current3
Line Current3	Frequency
L-N Volt1 (V)	L-N Volt1 (V)
L-N Volt2 (V)	L-N Volt2 (V)
L-N Volt3 (V)	L-N Volt3 (V)
Percent Amps A	Percent Amps A
Percent Amps B	Percent Amps B
Percent Amps C	Percent Amps C
Total kVA (kVA)	S1 L-L Volt1 (a-b) (V)
Engine Runtime (Hours)	S1 L-L Volt2 (b-c) (V)
Engine Starts	S1 L-L Volt3 (a-c) (V)
kW Phase A (kW)	S1-Frequency
kW Phase B (kW)	S2 L-L Volt1 (a-b) (V)
kW Phase C (kW)	S2 L-L Volt2 (b-c) (V)
Total kW (kW)	S2 L-L Volt3 (a-c) (V)
Total kVAR (kVAR)	S2-Frequency
Total Power Factor	
Oil Temp (F)	
Fuel Level	
Fuel Rate (Gal/hr)	

The parameter graph duration selections are:

- Past 1 hour

- Past 24 hours
- Past 7 days

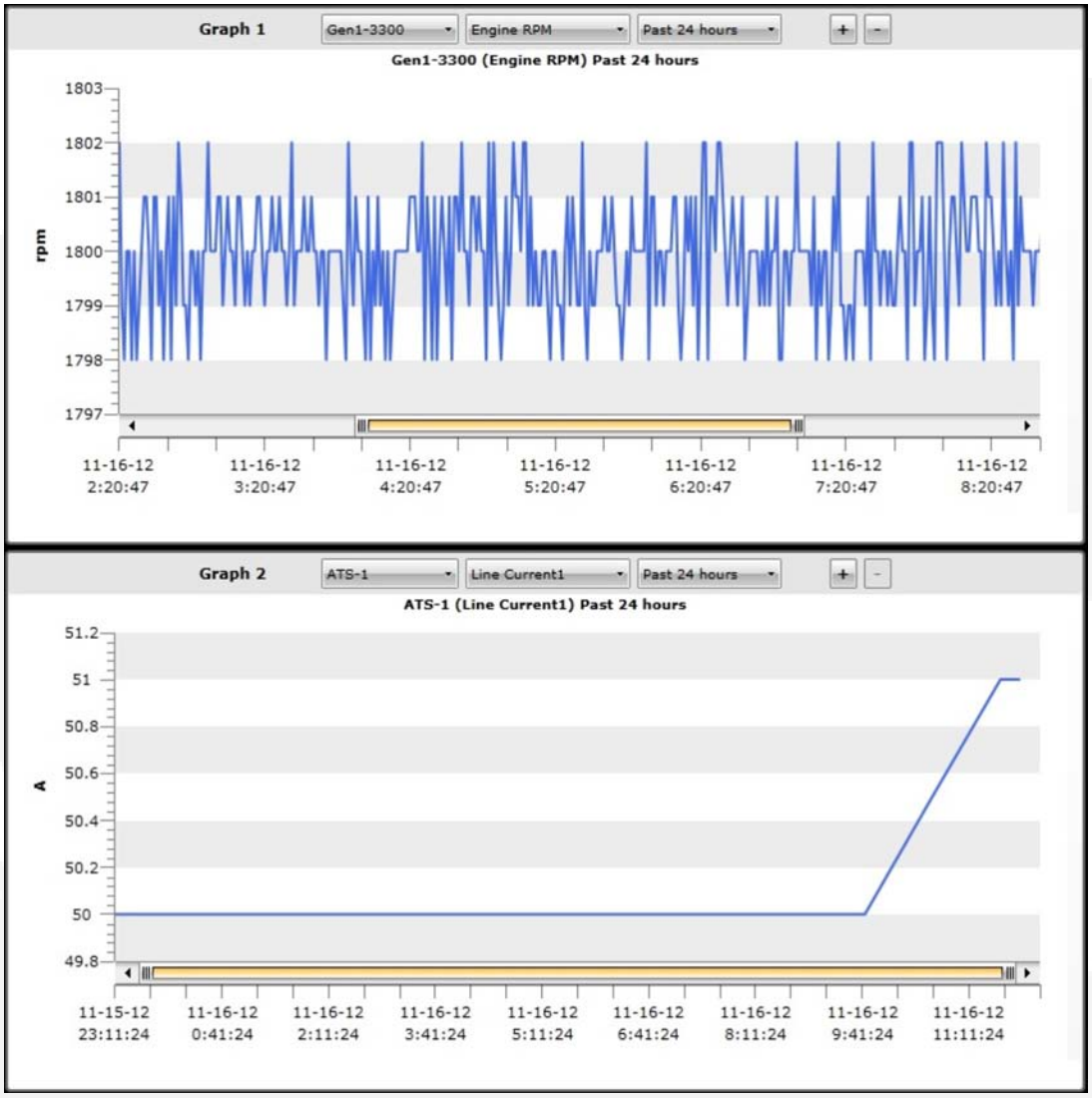
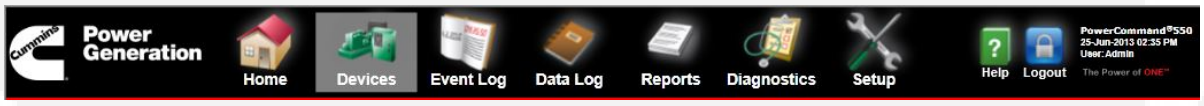


FIGURE 61. DEVICE PARAMATER GRAPHS

7.5 Devices Page



The Devices Page displays the general status for each device.

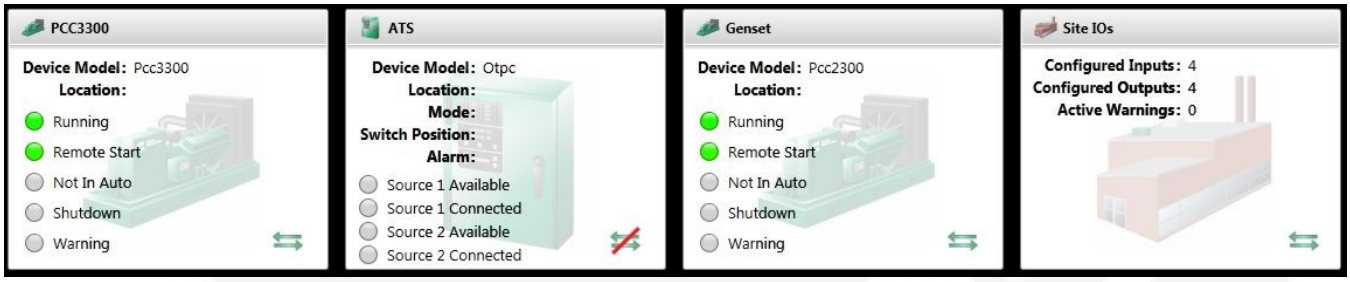


FIGURE 62. DEVICES PAGE

The annunciator indicators to the left of each status show the current state of the device.

- No color = No Issue
- Green = Running, Remote Start, Source 1 Available, and Source 1 Connected
- Yellow = Warning, Source 2 Available, and Source 2 Connected
- Red = Not In Auto, Shutdown Fault

Communication status is shown in the lower right corner.

Select a device to display more details for the specific device.

7.5.1 Generator Set Details

Selection of a generator set from the Home Page or Devices Page navigates the user to the details page for the selected generator set.

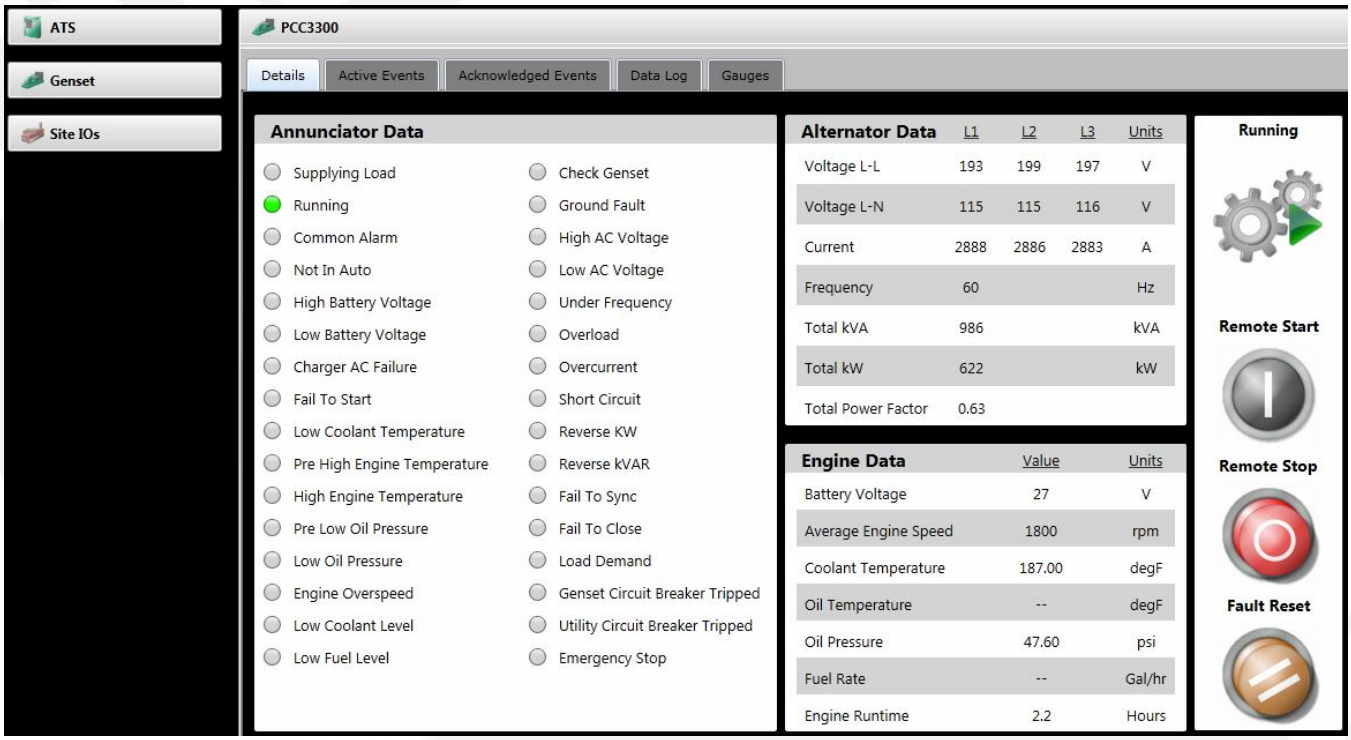


FIGURE 63. GENERATOR SET DETAILS

The Annunciator Data indicators show annunciator data status.

- No color = No Issue

- Green = Running
- Yellow = Warning Condition
- Red = Shutdown Condition

Alternator Data and Engine Data show alternator and engine parameters with their values and units.

The generator set status on the right displays the running status (running/stopped), and provides buttons to remotely start or stop the generator set and reset faults. The buttons are gray if they are not available for selection. When available for selection:

- Remote Start - Green
- Remote Stop - Red
- Fault Reset - Amber

NOTICE
PCC1301 and PCC1302 controls do not support a remote Fault Reset.

Other configured devices are shown on the left side of the display. Select a device to navigate to its details page.

Select **Active Events** to display the active events from the event log for the generator set.

Select **Acknowledged Events** to display the acknowledged events for the generator set.

Select **Data Log** to display the data log for the generator set.

Select **Gauges** to display the generator set gauges that were selected when adding the generator set device.

7.5.2 ATS Details

Selection of an ATS from the Home Page or Device Page navigates the user to the details page for the selected ATS.

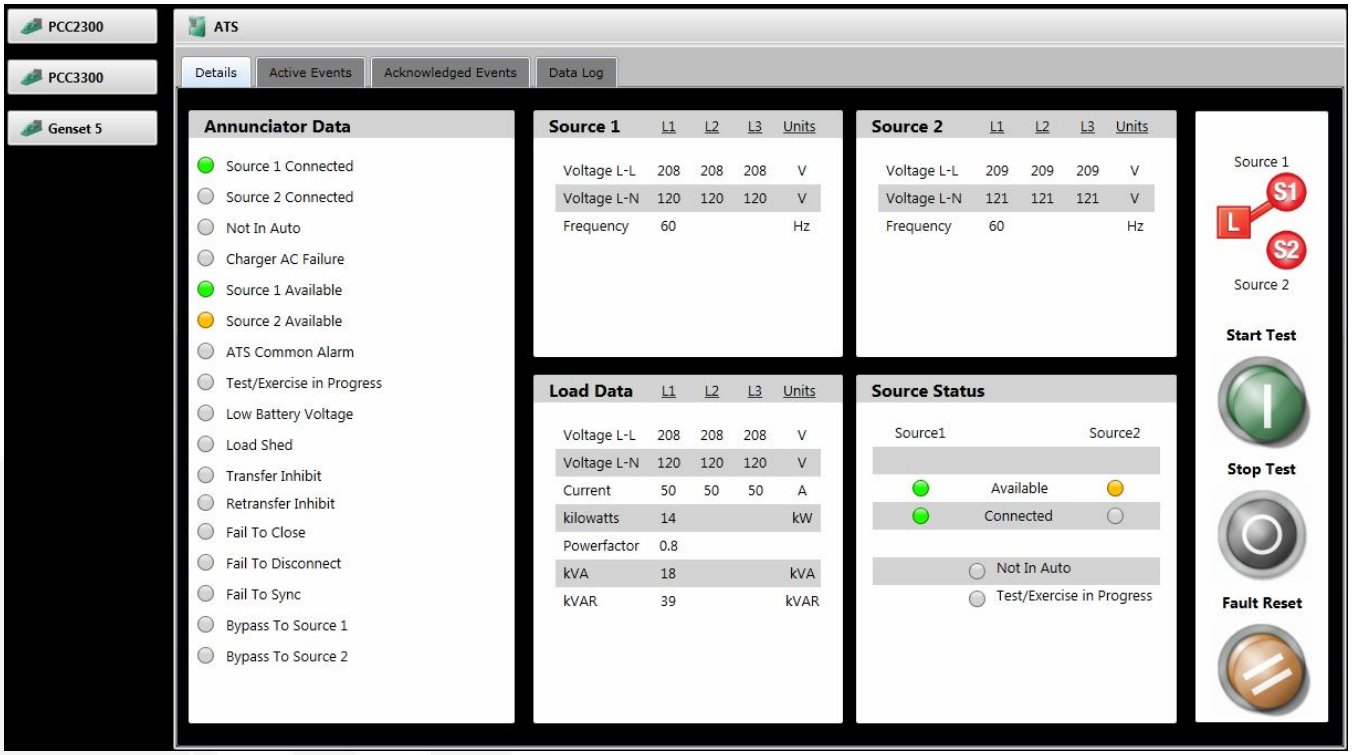


FIGURE 64. ATS DETAILS

The Annunciator Data indicators show annunciator data status.

- No color = No Issue
- Green = Source 1 Available and Source 1 Connected
- Yellow = Source 2 Available, Source 2 Connected, Test/Exercise In Progress, and Warning Condition
- Red = Not In Auto, Shutdown Condition

Source 1, Source 2, and Load Data show the associated parameters with their values and units.

The Source Status indicator colors indicate:

- No color = No Issue
- Green = Source 1 Available and Connected
- Yellow = Source 2 Available and Connected, and Test/Exercise In Progress
- Red = Not In Auto

The ATS status on the right displays source availability and connection status (Source 1/Source 2), and provides buttons to start or stop a test, and reset faults. The buttons are gray if they are not available for selection. When available for selection:

- Start Test - Green
- Stop Test - Red
- Fault Reset - Amber

Other configured devices are shown on the left side of the display. Select a device to navigate to its details page.

Select **Active Events** to display the active events for the ATS.

Select **Acknowledged Events** to display the acknowledged events from the event log for the ATS.

Select **Data Log** to display the data log for the ATS.

7.5.3 Site IOs Details

Selection of Site IOs from the Home Page or Devices Page navigates the user to the details page for sensors and output controls.

FIGURE 65. SITE IOS DETAILS

The Sensors configured into the system are shown with their state/value, Low Warning, High Warning, and Units data.

Output controls are turned on and off on this page by selecting the Off/On switch. When the switch is turned on, the right side of the switch is green and the State is Active. When off, the left side of the switch is red and the State is Inactive.

Other configured devices are shown on the left side of the display. Select a device to navigate to its details page.

Select **Active Events** to display the active events for the sensors.

Select **Acknowledged Events** to display the acknowledged events from the event log for the sensors.

7.5.4 Active Events

The Active Events tab displays the events that are currently active for the device.

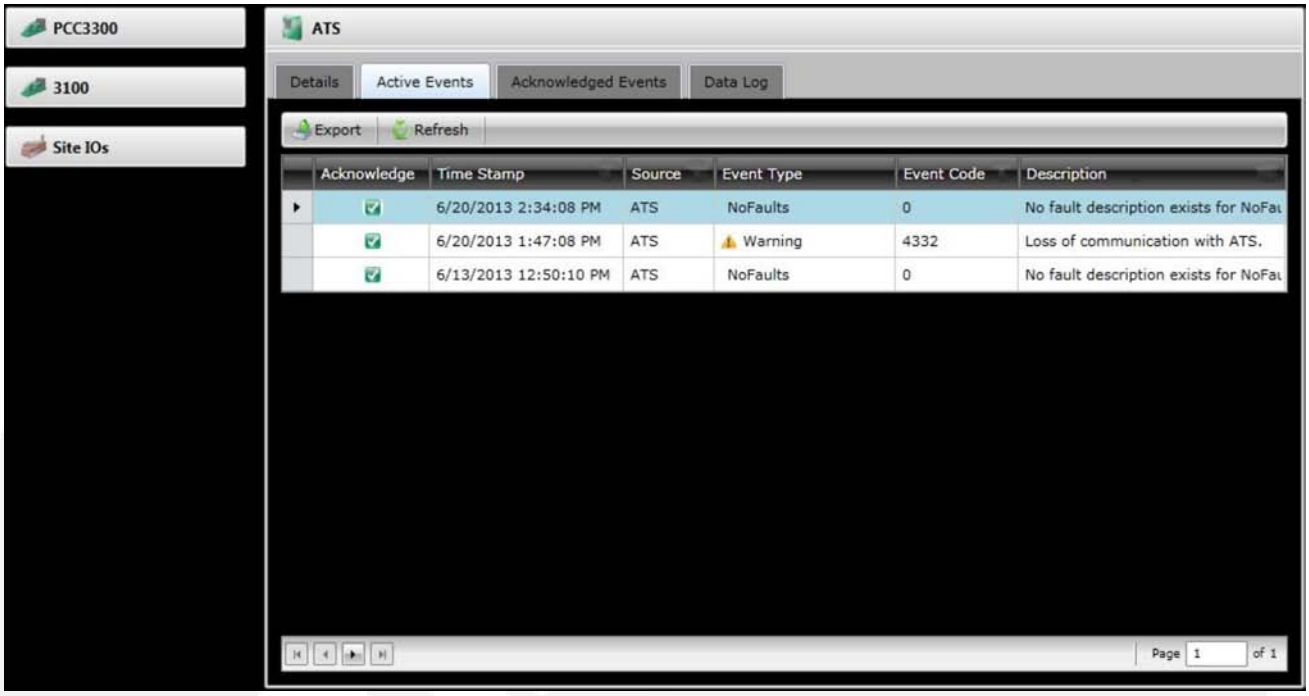


FIGURE 66. ACTIVE EVENTS

The page number and number of pages are shown on the bottom right side of the screen. When there are multiple pages, use the paging control buttons on the left to view the first, previous, next, or last page.

Select **Export** to save the event list to a CSV file.

Select **Refresh** to refresh the event list.

Select the green check box in the **Acknowledge** column to acknowledge the event. Once events have been acknowledged, they are moved to the Acknowledged Events page.

7.5.5 Acknowledged Events

The Acknowledged Events tab displays the events that have been acknowledged in Active Events.

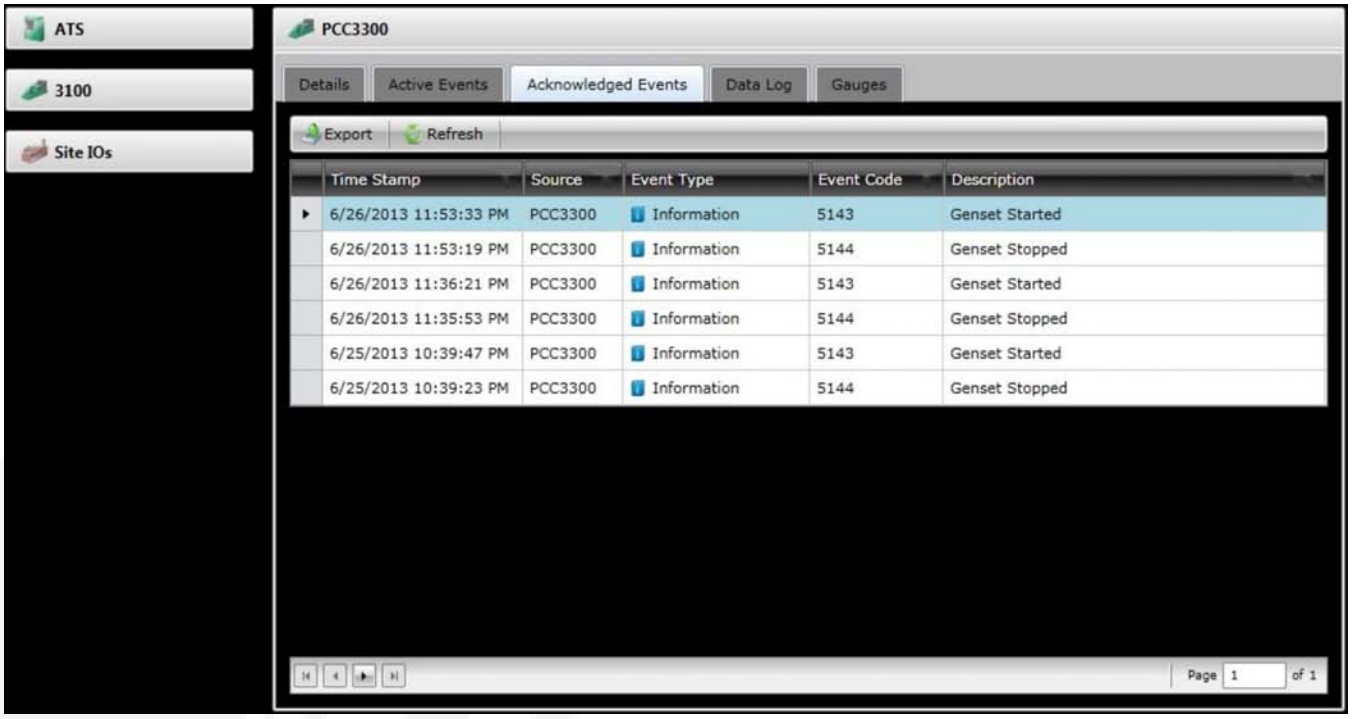


FIGURE 67. ACKNOWLEDGED EVENTS

The page number and number of pages are shown on the bottom right side of the screen. When there are multiple pages, use the paging control buttons on the left to view the first, previous, next, or last page.

Select **Export** to save the event list to a CSV file.

Select **Refresh** to refresh the event list.

7.5.6 Data Log

The Data Log tab displays a data log for the device.

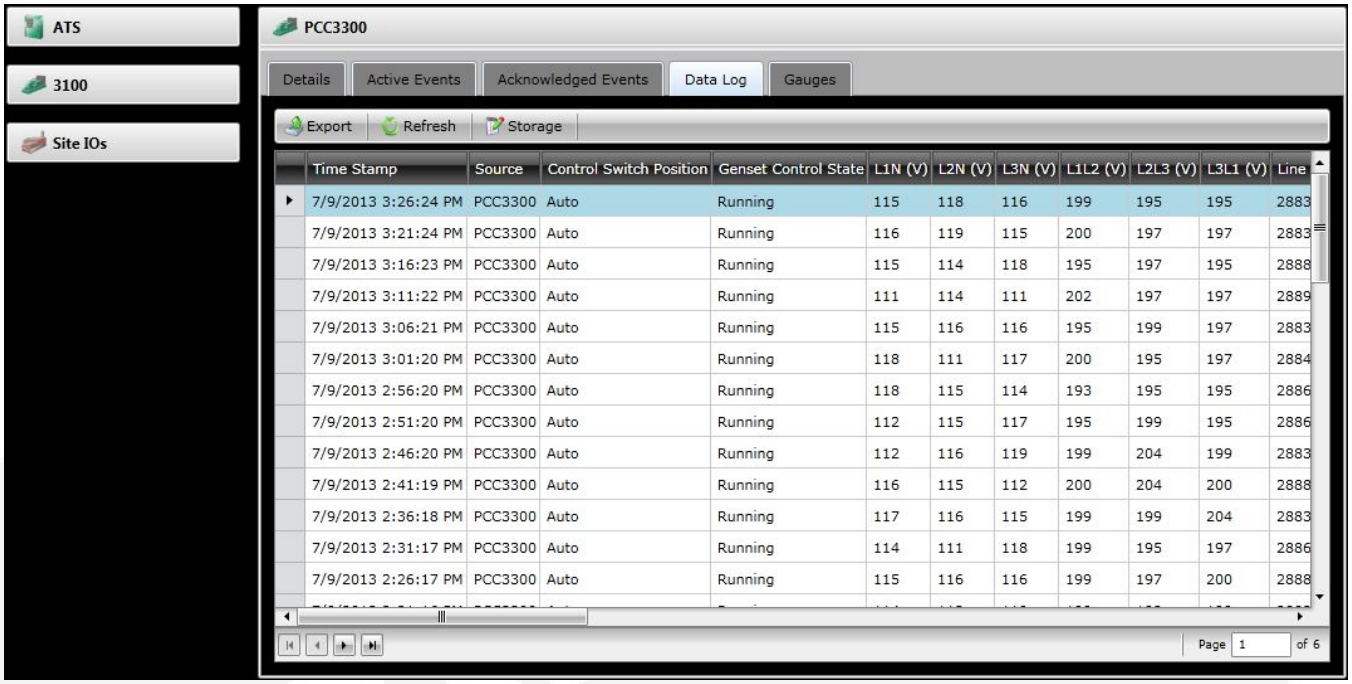


FIGURE 68. DATA LOG

The page number and number of pages are shown on the bottom right side of the screen. When there are multiple pages, use the paging control buttons on the left to view the first, previous, next, or last page.

The data that is displayed for generator sets and ATSs is shown in the table below.

TABLE 7. GENERATOR SET AND ATS DATA LOG DATA

Generator Set	ATS
Time Stamp	Time Stamp
Source	Source
Control Switch Position	Mode
Genset Control State	Active Transfer Time
L1N (V)	L-L1N (V)
L2N (V)	L-L2N (V)
L3N (V)	L-L3N (V)
L1L2 (V)	L-L1L2 (V)
L2L3 (V)	L-L2L3 (V)
L3L1 (V)	L-L3L1 (V)
Line Current1	Line Current1
Line Current2	Line Current2
Line Current3	Line Current3
KW Phase A	L-Total kW
KW Phase B	L-TPF
KW Phase C	L-Total kVAR

Generator Set	ATS
Total kW	L-Total kVA
Total Power Factor	L-Frequency (Hz)
Total kVA	L-Percent Amps A Phase (%)
Frequency	L-Percent Amps B Phase (%)
Percent Amps A	L-Percent Amps C Phase (%)
Percent Amps B	S1-L1N (V)
Percent Amps C	S1-L2N (V)
Battery Voltage	S1-L3N (V)
Oil Pressure (psi)	S1-L1L2 (V)
Coolant Temp (F)	S1-L2L3 (V)
Engine RPM	S1-L3L1 (V)
Engine Starts	S1-L1 Current (A)
Engine Runtime (Hours)	S1-L2 Current (A)
Oil Temp (F)	S1-L3 Current (A)
Fuel Rate (Gal/hr)	S1-Total kW
Percent Fuel Level	S1-TPF
	S1-Total kVAR
	S1-Total kVA
	S1-Frequency (Hz)
	S1-Percent Amps A Phase (%)
	S1-Percent Amps B Phase (%)
	S1-Percent Amps C Phase (%)
	S2-L1N (V)
	S2-L2N (V)
	S2-L3N (V)
	S2-L1L2 (V)
	S2-L2L3 (V)
	S2-L3L1 (V)
	S2-L1 Current (A)
	S2-L2 Current (A)
	S2-L3 Current (A)
	S2-Total kW
	S2-TPF
	S2-Total kVA
	S2-Total kVAR
	S2-Frequency (Hz)
	S2-Percent Amps A Phase (%)
	S2-Percent Amps B Phase (%)

Generator Set	ATS
	S2-Percent Amps C Phase (%)

Select **Export** to save the event list to a CSV file.

Select **Refresh** to refresh the event list.

Select **Storage** to display data log storage memory information. The blue represents the available memory and the red represents the used memory.

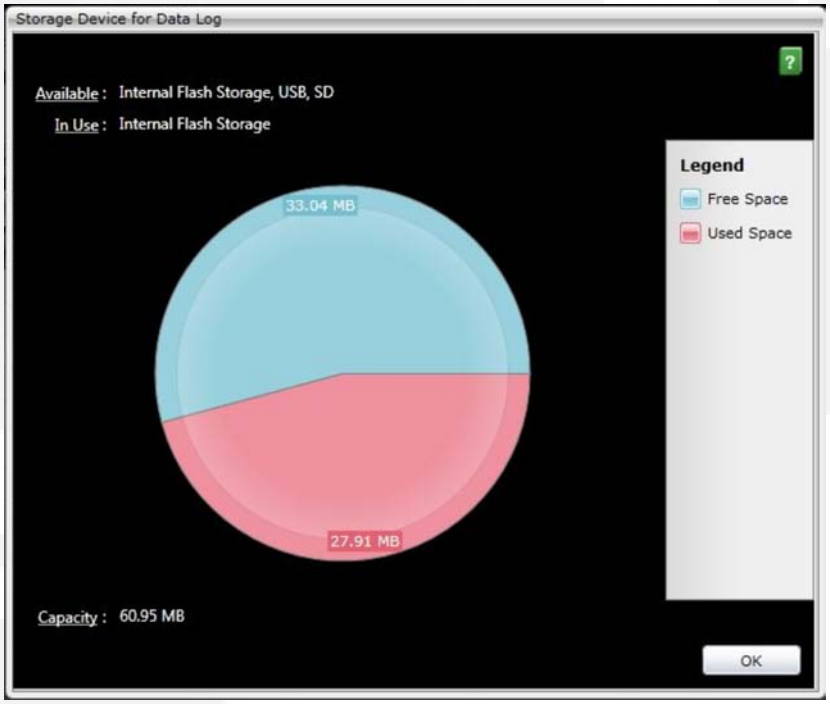


FIGURE 69. STORAGE DEVICE FOR DATA LOG

Select **OK** when finished viewing.

7.5.7 Gauges

The Gauges tab on the Generator Set Details page displays the gauges for the selected generator set that were selected when adding the generator set device.

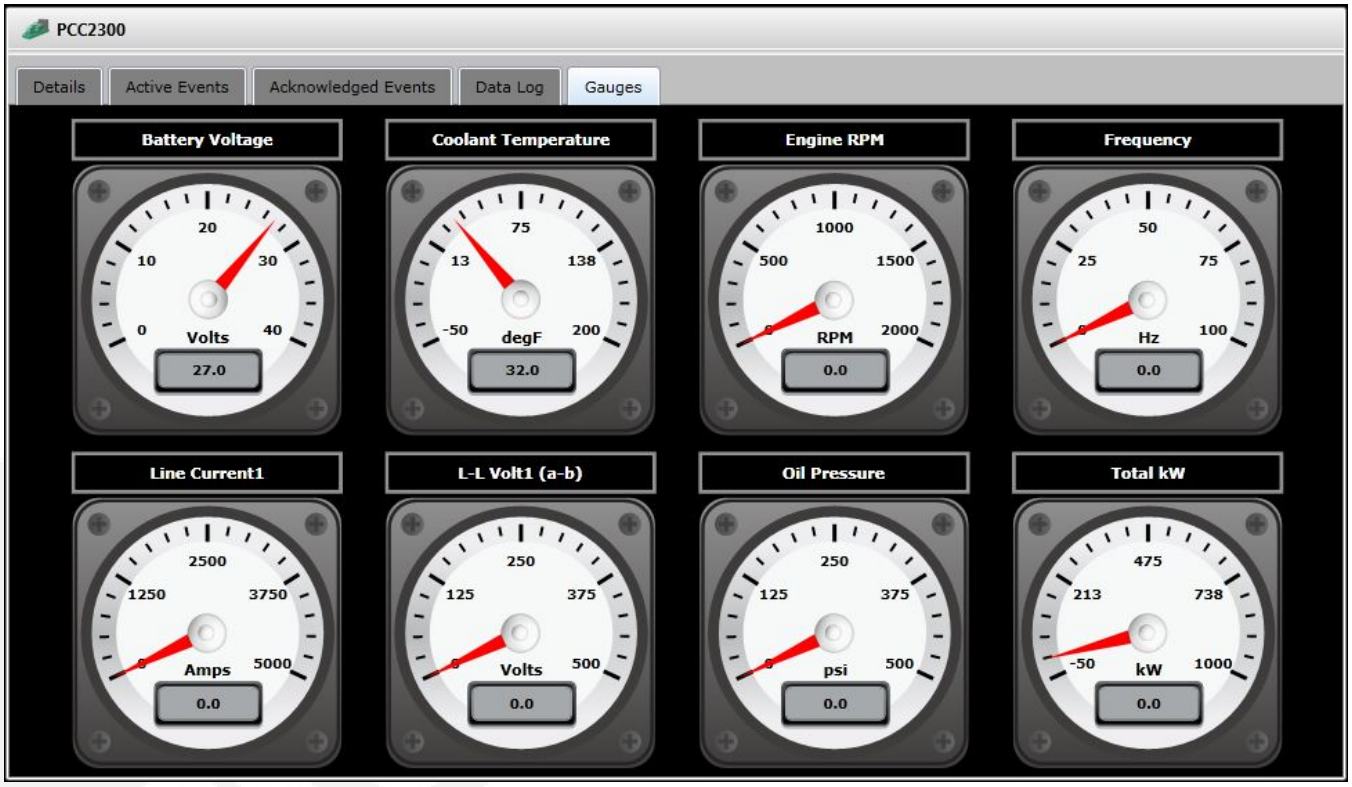


FIGURE 70. GAUGES

7.6 Event Log Page

The system Event Log Page displays a list of active or acknowledged events.

7.6.1 Active Events

The Active Events tab displays the events that are currently active in the system for all configured devices, including the PC500/550.

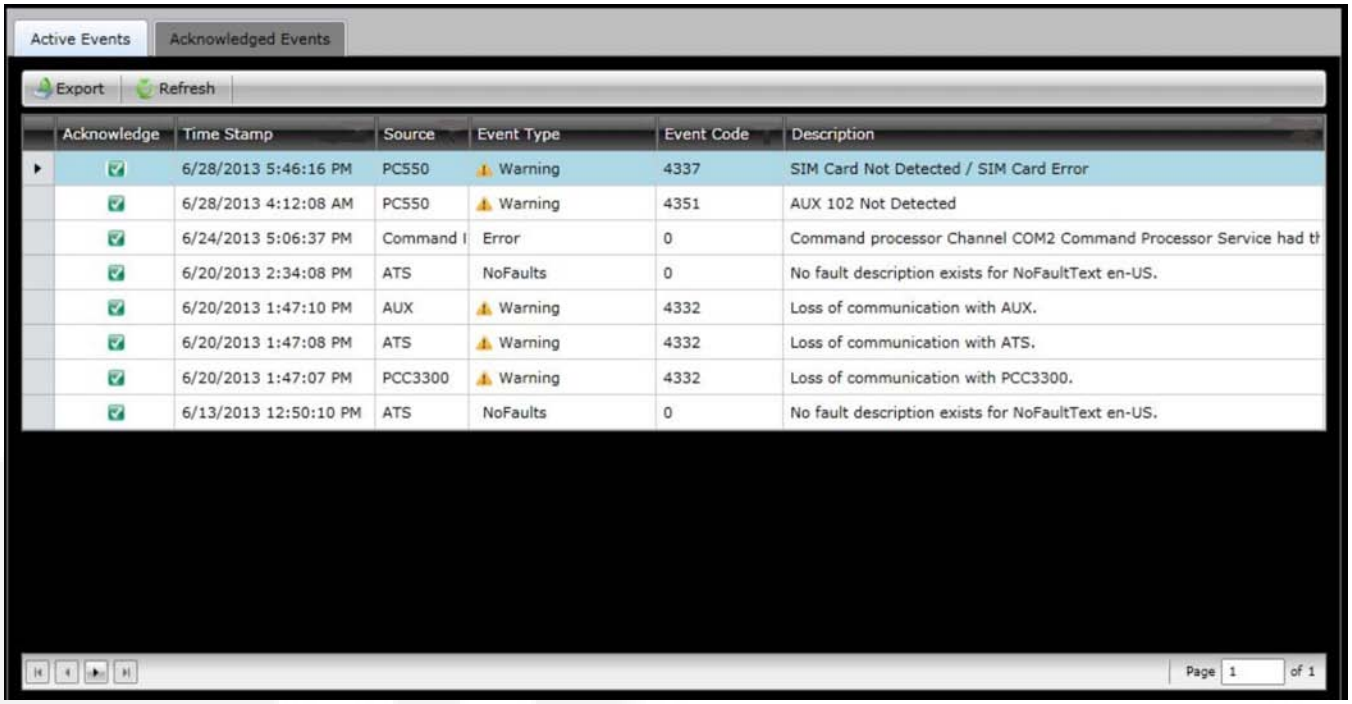


FIGURE 71. ACTIVE EVENTS

The page number and number of pages are shown on the bottom right side of the screen. When there are multiple pages, use the paging control buttons on the left to view the first, previous, next, or last page.

Select **Export** to save the event list to a CSV file.

Select **Refresh** to refresh the event list.

Select the green check box in the **Acknowledge** column to acknowledge the event. Once events are acknowledged, they are moved to the Acknowledged Events page.

Select **Acknowledged Events** to display events that have been acknowledged.

7.6.2 Acknowledged Events

The Acknowledged Events tab displays the events that have been acknowledged in Active Events.

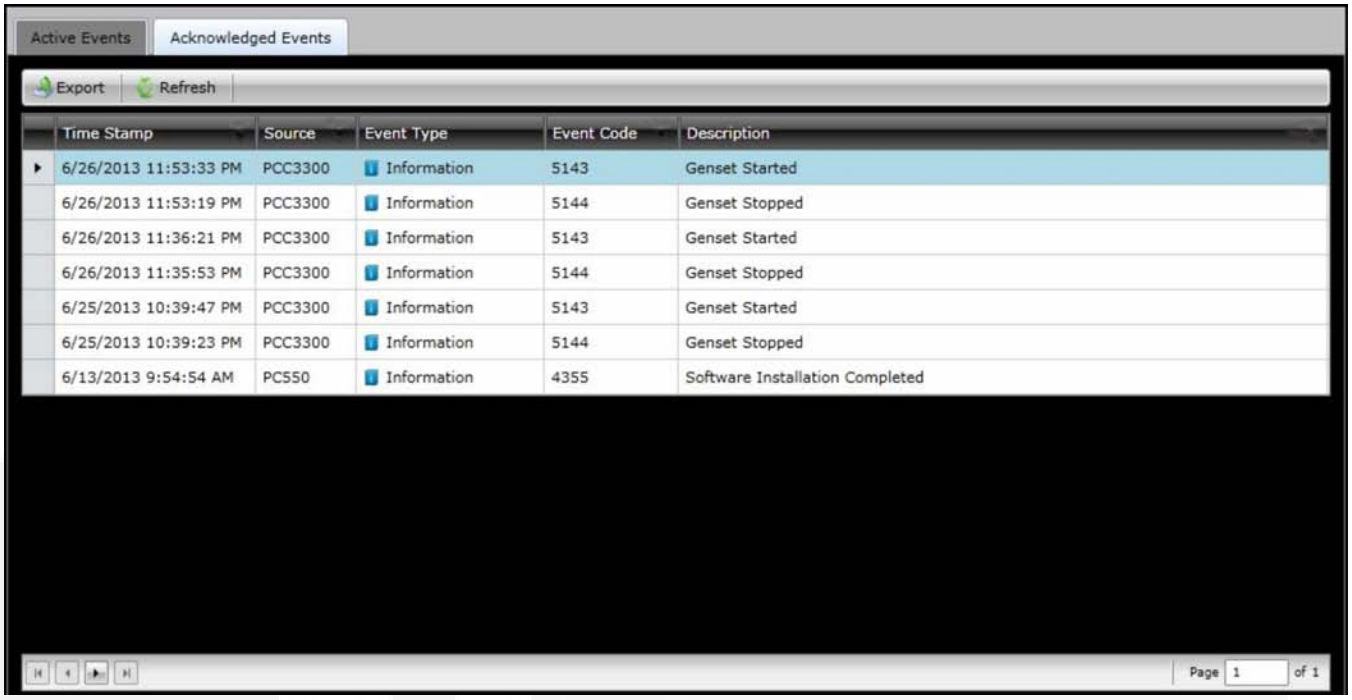


FIGURE 72. ACKNOWLEDGED EVENTS

The page number and number of pages are shown on the bottom right side of the screen. When there are multiple pages, use the paging control buttons on the left to view the first, previous, next, or last page.

Select **Export** to save the event list to a CSV file.

Select **Refresh** to refresh the event list.

7.7 Data Log Page

The Data Log Page displays a data log for each device type. The Data Log Page also allows viewing of storage space availability.

Depending on the number of configured PC500/550 devices and data log interval, the data log can easily reach its maximum capacity. A warning is triggered when the internal flash reaches 70% of the memory (internal or external) capacity. When the data log reaches 90% of the memory capacity, another warning is triggered and 25% of the oldest data log entries are erased.

The generator set devices are shown in the figure below. To display the ATS data log, select the ATS tab.

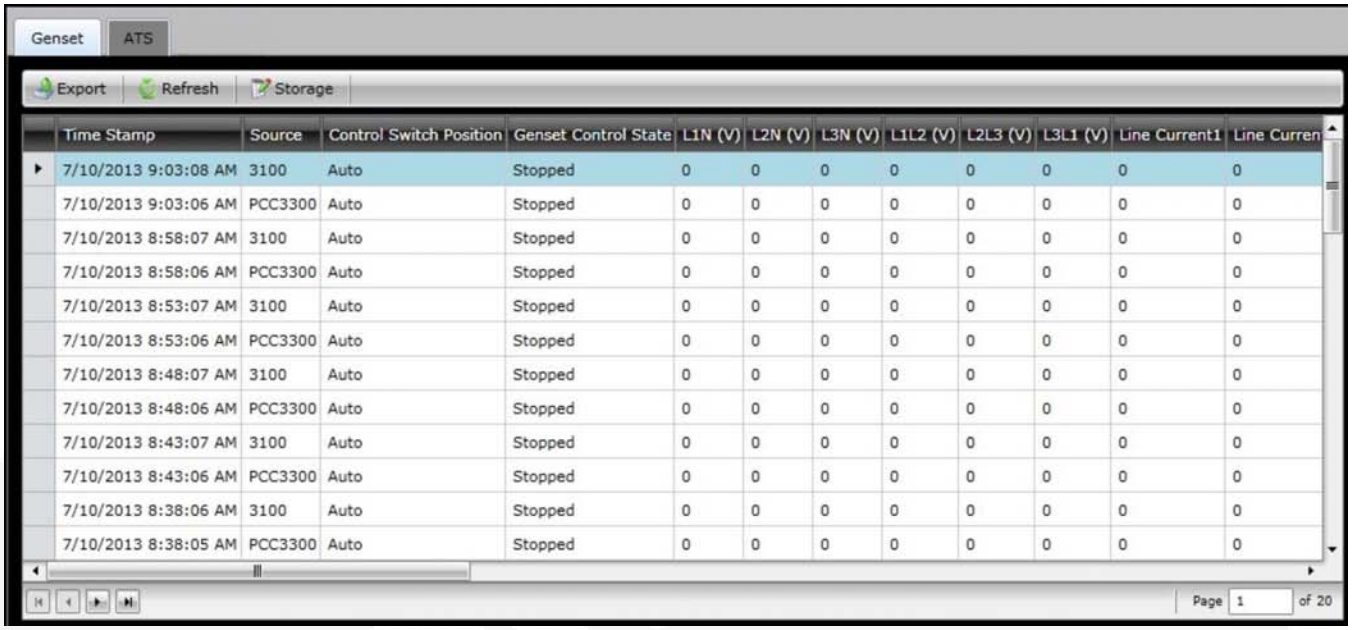


FIGURE 73. DATA LOG

The page number and number of pages are shown on the bottom right side of the screen. When there are multiple pages, use the paging control buttons on the left to view the first, previous, next, or last page.

The data that is displayed for a generator set and ATS is shown in the table below.

TABLE 8. GENERATOR SET AND ATS DATA LOG DATA

Generator Set	ATS
Time Stamp	Time Stamp
Source	Source
Control Switch Position	Mode
Genset Control State	Active Transfer Time
L1N (V)	L-L1N (V)
L2N (V)	L-L2N (V)
L3N (V)	L-L3N (V)
L1L2 (V)	L-L1L2 (V)
L2L3 (V)	L-L2L3 (V)
L3L1 (V)	L-L3L1 (V)
Line Current1	Line Current1
Line Current2	Line Current2
Line Current3	Line Current3
KW Phase A	L-Total kW
KW Phase B	L-TPF
KW Phase C	L-Total kVAR
Total kW	L-Total kVA

Generator Set	ATS
Total kVAR	L-Frequency (Hz)
Total Power Factor	L-Percent Amps A Phase (%)
Total kVA	L-Percent Amps B Phase (%)
Frequency	L-Percent Amps C Phase (%)
Percent Amps A	S1-L1N (V)
Percent Amps B	S1-L2N (V)
Percent Amps C	S1-L3N (V)
Battery Voltage	S1-L1L2 (V)
Oil Pressure (psi)	S1-L2L3 (V)
Coolant Temp (F)	S1-L3L1 (V)
Engine RPM	S1-L1 Current (A)
Engine Starts	S1-L2 Current (A)
Engine Runtime (Hours)	S1-L3 Current (A)
Oil Temp (F)	S1-Total kW
Fuel Rate (Gal/hr)	S1-TPF
Fuel Level	S1-Total kVAR
	S1-Total kVA
	S1-Frequency (Hz)
	S1-Percent Amps A Phase (%)
	S1-Percent Amps B Phase (%)
	S1-Percent Amps C Phase (%)
	S2-L1N (V)
	S2-L2N (V)
	S2-L3N (V)
	S2-L1L2 (V)
	S2-L2L3 (V)
	S2-L3L1 (V)
	S2-L1 Current (A)
	S2-L2 Current (A)
	S2-L3 Current (A)
	S2-Total kW
	S2-TPF
	S2-Total kVA
	S2-Total kVAR
	S2-Frequency (Hz)
	S2-Percent Amps A Phase (%)
	S2-Percent Amps B Phase (%)
	S2-Percent Amps C Phase (%)

Select **Export** to save the event list to a CSV file.

Select **Refresh** to refresh the event list.

Select **Storage** to display data log memory storage information. The blue represents the available memory and the red represents the used memory.

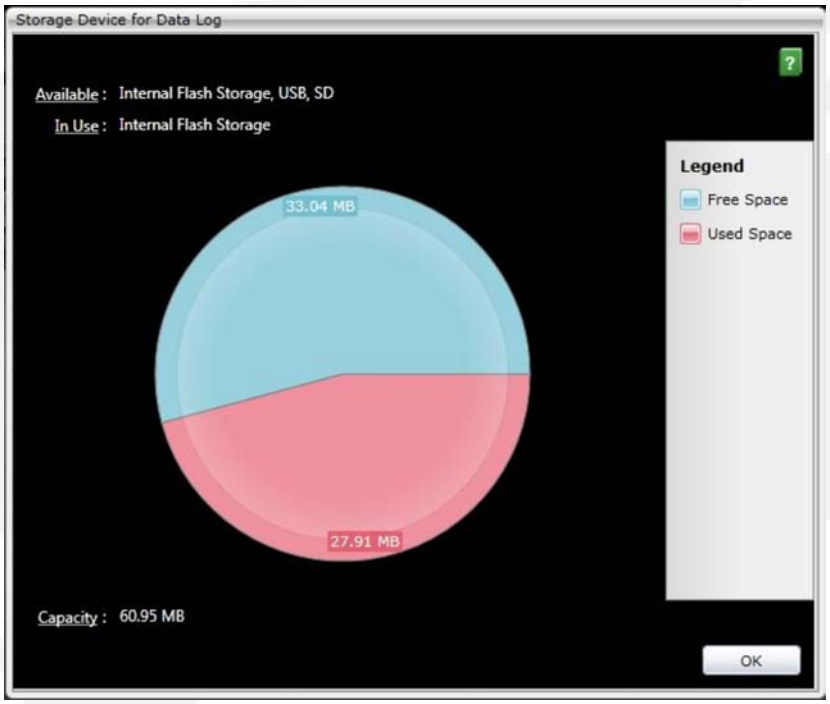
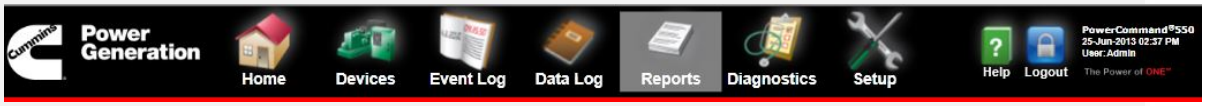


FIGURE 74. STORAGE DEVICE FOR DATA LOG

Select **OK** when finished viewing.

7.8 Reports Page



The Reports Page is used to create and save a report.

FIGURE 75. REPORTS

1. Select **Create Report**.

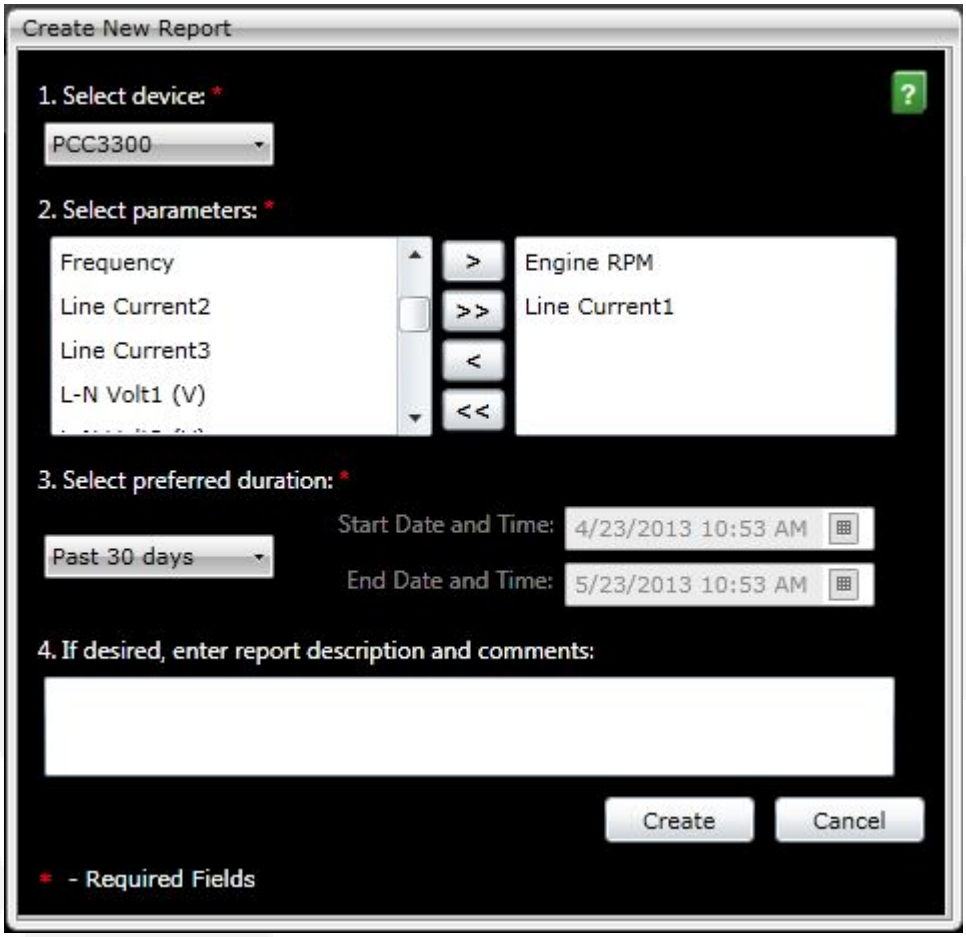


FIGURE 76. CREATE NEW REPORT

2. Select the device from the drop-down list.
3. Select the desired parameter(s) and select the right arrow to move the parameter(s) to the selection window.

NOTICE
Multiple parameters can be selected by using the Shift and Control keys.

- **>** Move selected parameter(s) to the selection window.
- **>>** Move all parameters to the selection window.
- **<** Remove selected parameter(s) from the selection window.
- **<<** Remove all parameters from the selection window.

4. Select preferred duration from the drop-down list.
   - Custom
   - Past 24 hours
   - Past 7 days
   - Past 30 days

5. If a custom duration is selected, enter the start and end date and time.

NOTICE
The duration of the start and end dates cannot exceed 31 days.

6. Add any comments, if desired.
7. Select **Create**.

FIGURE 77. REPORT EXAMPLE

The first parameter is automatically selected and the corresponding graph is displayed on the right. To display a different parameter's graph, select a parameter on the left.

NOTICE
The Annunciator data and graph show extended events data and are only displayed when all parameters are selected to create the report.

To save the report, select the **Save Report** button. In the browser window, select a location to save the report.

NOTICE
The Save Report option is only available for the PC550.

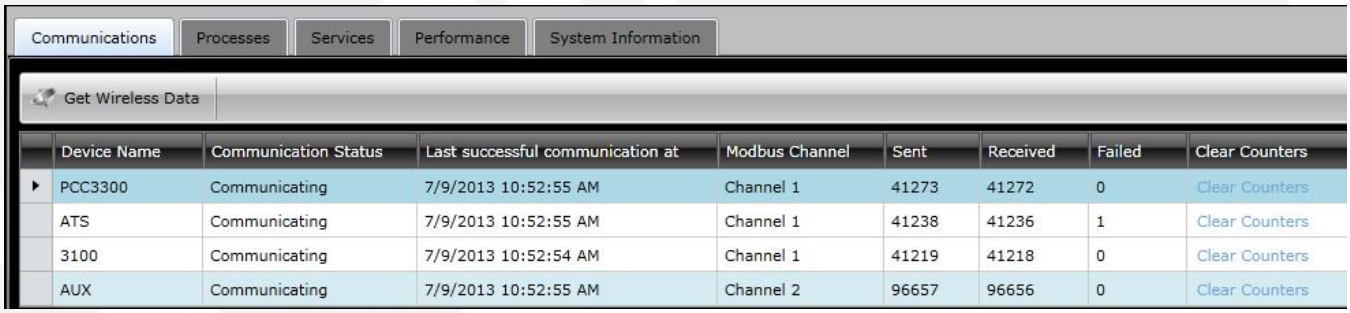
7.9 Diagnostics Page

The Diagnostics Page provides 5 tabs for displaying diagnostic information.

- Communications
- Processes
- Services
- Performance
- System Information

7.9.1 Communications

The Communications tab displays the Modbus communication status of all monitored devices.



Device Name	Communication Status	Last successful communication at	Modbus Channel	Sent	Received	Failed	Clear Counters
PCC3300	Communicating	7/9/2013 10:52:55 AM	Channel 1	41273	41272	0	Clear Counters
ATS	Communicating	7/9/2013 10:52:55 AM	Channel 1	41238	41236	1	Clear Counters
3100	Communicating	7/9/2013 10:52:54 AM	Channel 1	41219	41218	0	Clear Counters
AUX	Communicating	7/9/2013 10:52:55 AM	Channel 2	96657	96656	0	Clear Counters

FIGURE 78. COMMUNICATIONS

Select the **Clear Counters** link to clear the message counters for the device.

Select **Get Wireless Data** to display the cellular modem data. Select **OK** when done viewing the data.

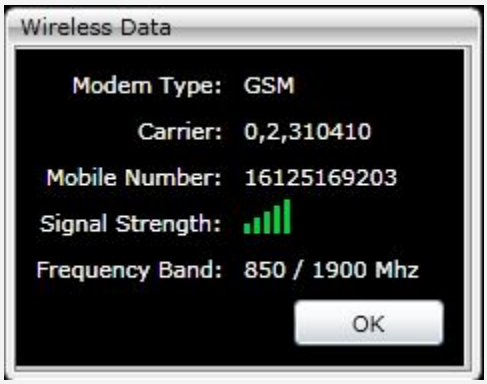


FIGURE 79. WIRELESS DATA

7.9.2 Processes

The Processes tab displays a list of all current processes and allows the user to perform a soft reboot/restart of the PC500/550 system.

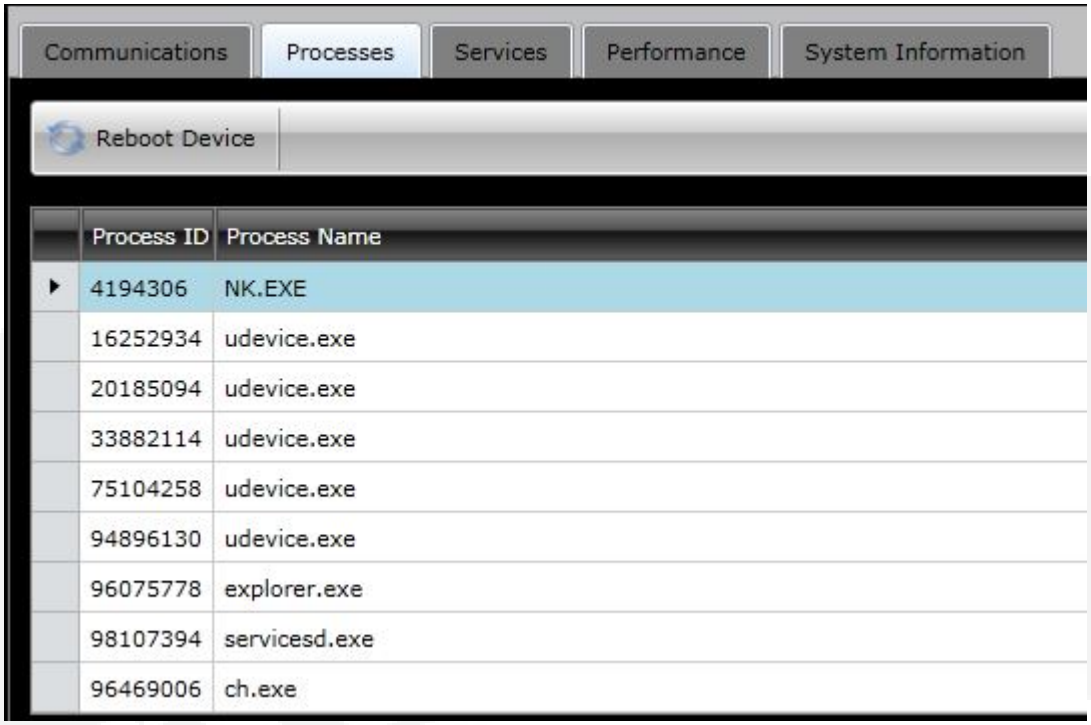
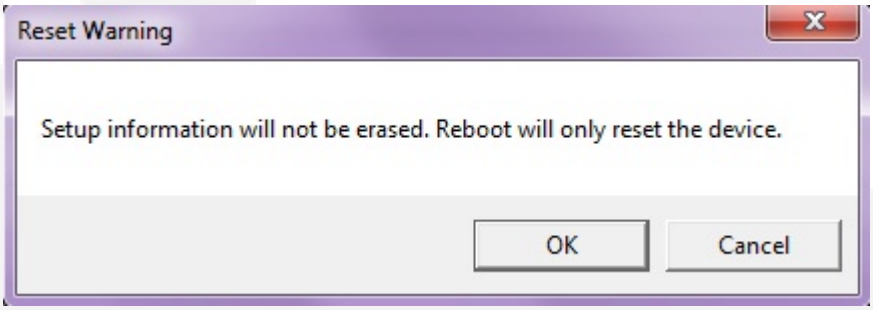


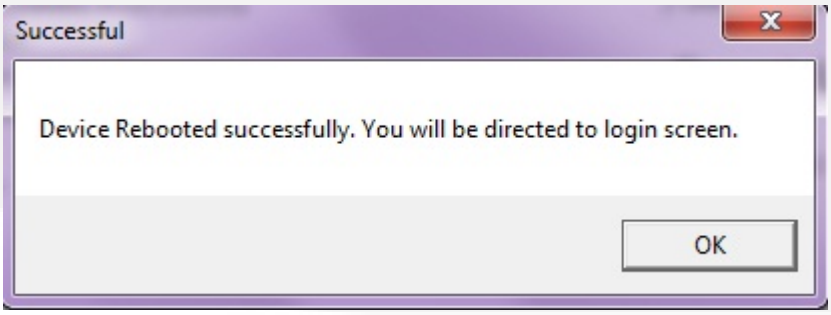
FIGURE 80. PROCESSES

To reboot the device:

1. Select **Reboot Device**. The following message is displayed.



2. Select **OK**.
3. When the reboot completes, the following message is displayed:



4. Select **OK**.

7.9.3 Services

The Services tab displays a list of all current services and their states, and allows the user to perform a soft reboot/restart of the PC500/550 system.

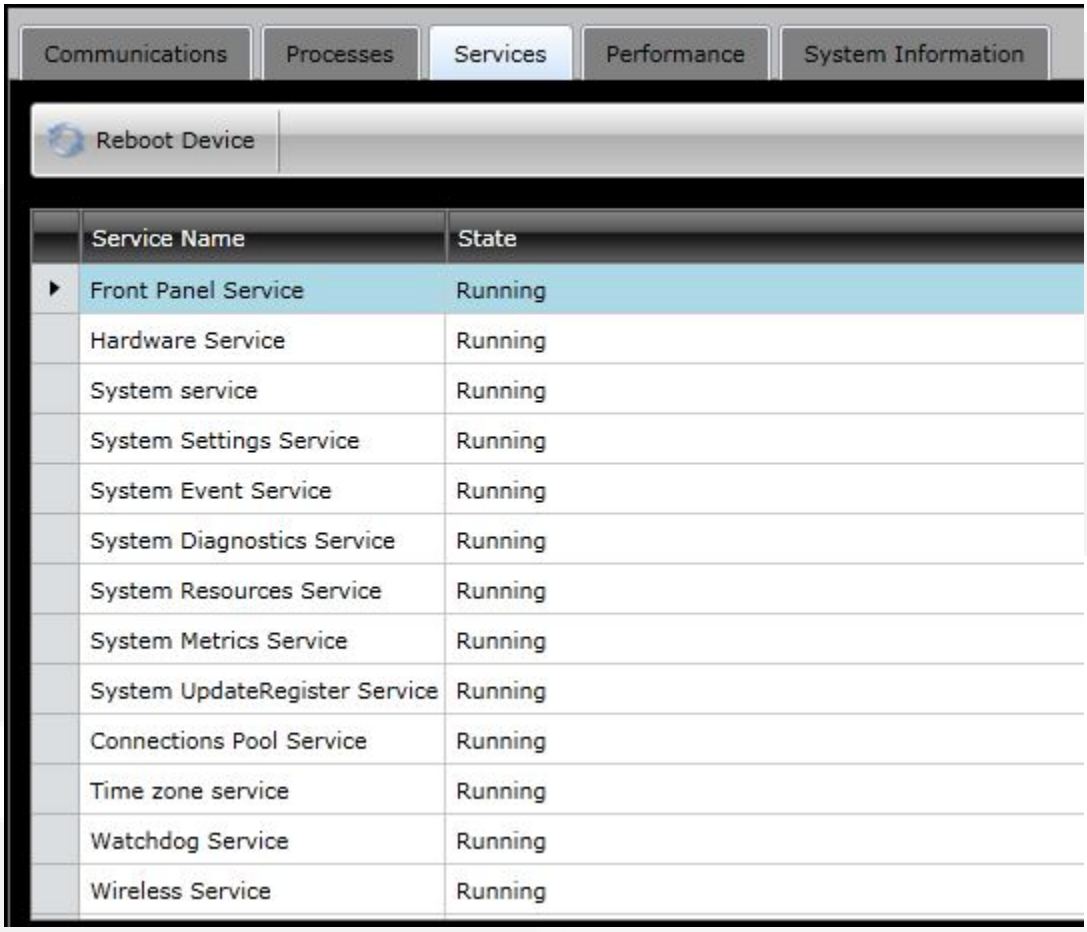


FIGURE 81. SERVICES

Select **Reboot Device** to reset the device.

7.9.4 Performance

The Performance tab displays a list of performance data.

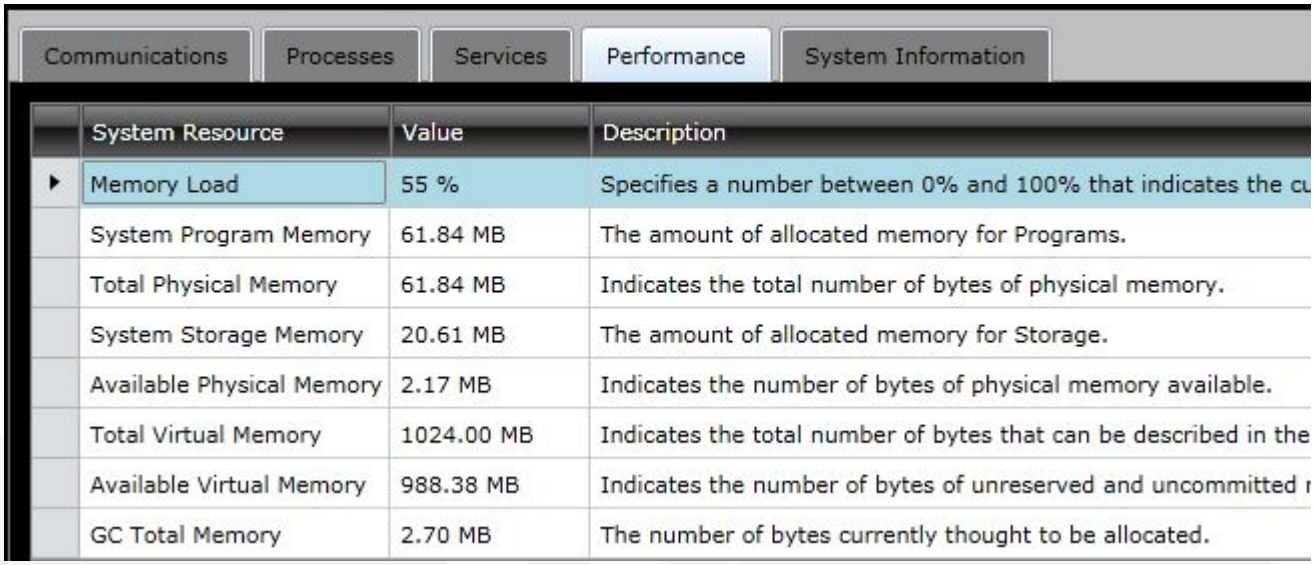


FIGURE 82. PERFORMANCE

7.9.5 System Information

The System Information tab displays information related to the PC500/550 system.

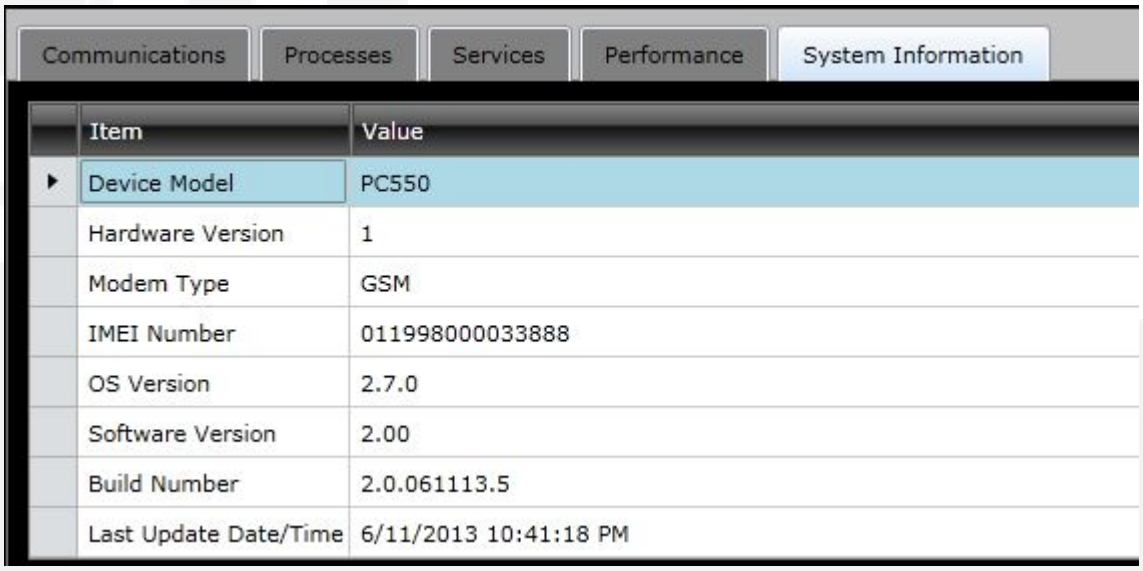


FIGURE 83. SYSTEM INFORMATION

8 Troubleshooting

Troubleshooting provides corrective actions for event codes and symptom-based faults. If a problem is not resolved after taking the corrective actions suggested, contact a local dealer or distributor. See **Section 2.3 on page 4**.

8.1 Event Codes

8.1.1 ⚠ Code 319 – Real-Time Clock Backup Battery – Very Low Voltage

The PC500/550 has detected a very low battery voltage in the real-time clock battery inside the PC500/550.

Possible Cause	Corrective Action
The voltage on the internal battery of the PC500/550 has decreased to a point where it will no longer back up the real-time clock of the PC500/550. This can be due to a defective battery or a battery that has been used for a long period of time.	Replace the real time clock battery with 3 VDC battery.
If the battery has been recently replaced, the wrong battery may have been installed.	Make sure the battery is 3 VDC battery. If not, replace it with a 3 VDC battery.
Refer to **Chapter 10 on page 107** for the battery replacement procedure.	

NOTICE
Internal battery replacement should be done by a certified distributor; otherwise the warranty will be voided.

8.1.2 ⚠ Code 762 – Real-Time Clock Backup Battery Voltage Above Normal Operating Range

The PC500/550 has detected a high battery voltage in the real-time clock battery inside the PC500/550.

Possible Cause	Corrective Action
The battery has been replaced with a battery that does not meet the specifications for this application.	Make sure the battery is 3 VDC battery. If not, replace it with a 3 VDC battery. Refer to **Chapter 10 on page 107** for the procedure to replace the battery.

NOTICE
Internal battery replacement should be done by a certified distributor; otherwise the warranty will be voided.

8.1.3 ⚠ Code 763 – Real-Time Clock Backup Battery Voltage Below Normal Operating Range

The PC500/550 has detected a low battery voltage in the real-time clock battery inside the PC500/550.

Possible Cause	Corrective Action
The battery is running low because of the amount of time in service (battery will normally last for 10 years under normal conditions).	Replace the real-time clock battery with a 3 VDC battery.
If the battery has been recently replaced, the wrong battery may have been installed.	Make sure the battery is 3 VDC battery. If not, replace it with a 3 VDC battery.
Refer to **Chapter 10 on page 107** for the procedure to replace the battery.	

NOTICE
Internal battery replacement should be done by a certified distributor; otherwise the warranty will be voided.

8.1.4 Code 4332 – Loss of Communication with (device) on Channel 1 or 2

The PC500/550 has lost communication with a Modbus device on one or both of the channels.

Possible Cause	Corrective Action	
	PC2100, PC3100, PC3200, PC3201 and ATS Controls	**PC1301, PC1302, PC2300, PC3300 Controls**
There has been a power interruption to the device that the PC500/550 is monitoring.	1. Verify if there has been a power interruption to the Modlon that is sending Modbus information from the device to which communication was lost. 2. If Modlon has not lost power, check if any of the devices (Generator Sets or ATSs) connected to the Modlon have lost power to their controls. • For generator sets, this fault can be caused if a generator set battery is disconnected. • For ATSs, this fault can be caused if there is not a B+ on J27-21 of the ATS digital board and there is an interruption to the utility power.	If the battery of any of the generator sets being monitored is disconnected, make sure that the generator set that has lost communication to the PC500/550 is properly energized.
The Modbus RTU protocol of the device (Generator set or ATS) that is being monitored is not detected.		Verify that Modbus protocol is enabled on the device (Generator Set or ATS) that is being monitored. This can be verified by navigating through the control's display or by connecting to the control with the InPower service tool.
The Modbus settings on the device do not match the settings on the PC500/550's channel.	Browse to the Modlon that is sending the data for the device that has communication issues and verify that the settings on the nciModLonCfg network match the settings on the Modbus Settings menu in the PC500/550's user interface.	Connect the control to the InPower service tool or navigate through the display and verify that the control Modbus settings match the settings on the Modbus Settings menu in the PC500/550s user interface.
Modbus data cable connected with an inverted polarity to the channel Terminal Block (TB2) of the PC500/550. (Modbus RTU protocol is polarity sensitive.)	On TB2, verify that the Modlon to PC500/550 cable is properly connected on the channel being used to monitor the equipment. Make sure that the wires are not inverted.	Verify that all devices are daisy chained properly (no inverted cable) and that the + and – of the cable matches the labeling on PC500/550 TB2. One inverted cable can cause communication failures with all devices.
Bad Modbus device.	Use LonMaker to verify that all Lon devices are properly commissioned and communicating with each other. If so, connect ModScan, or other modules monitoring software, to verify that all Modbus information is being received from ModLon II.	Use ModScan, or any other Modbus monitoring software, to verify that all Modbus information is being received from the control or AUX101.
Connected to an incorrect Modbus channel on the PC500/550.	On the Device Configuration page in the Setup menu of the PC500/550 UI, verify that the device is configured to use the channel it is connected to.	On the Device Configuration page in the Setup menu of the PC500/550 UI, verify that the device is configured to use the channel it is connected to.

Possible Cause	Corrective Action	
	PC2100, PC3100, PC3200, PC3201 and ATS Controls	PC1301, PC1302, PC2300, PC3300 Controls
Wrong Modbus address on device.	Each Modbus device should have a unique Modbus address on the network. Use LonMaker to verify the ModLon address. Verify that the Modbus address for the ModLon matches the Modbus address entered on the Device Configuration page in the Setup menu of the PC500/550 UI.	Each Modbus device should have a unique Modbus address on the network. Verify that the Modbus address for the ModLon matches the Modbus address entered on the Device Configuration page in the Setup menu of the PC500/550 UI.
Wrong index or template.	The index is the third number on the Modbus register that the ModLon sends for each control. For example, Gen1 has registers 40000-400, Gen2 has 40100-401, and so on. The index for Gen 1 is 0 and the index for Gen2 is 1. Make sure the correct index is selected for each of the devices being monitored.	

8.1.5 ⚠ Code 4333 – Fail to Send SMS Notification

The PC500/550 has failed to send a wireless message (SMS) when an event or fault occurred.

Possible Cause	Corrective Action	
	GSM Modem	CDMA Modem
The wireless service for the modem has not been activated.	Verify that the SIM card being used has been properly activated by the wireless provider, and that it has the capability to send text messages. Red LED in the modem inside the PC500/550 should be blinking, indicating that the SIM card is activated.	Verify that the CDMA modem inside the PC500/550 has been activated by the wireless provider. Refer to Section 5.4 for the activation process. Also, verify that the CDMA modem has been locally activated by pressing the **Activate CDMA** button on the System Settings page in the Setup menu of the PC500/550 UI.
SIM card has not been placed in the wireless modem or wrong frequency for the GSM modem has been selected in the PC500/550 UI.	Make sure the SIM card is inserted in the correct orientation and fully pushed into the SIM card slot on the PC500/550. User the silkscreen on the PC500/550 enclosure as a guide to verify proper SIM card orientation. On the System Settings page in the Setup menu of the PC500/550 UI, verify that the correct frequency has been selected for the region.	
There is no wireless signal where the PC500/550 is located.	On the Diagnostics page of the PC500/550 UI, press the **Get Wireless Data** button to display all wireless data. If all of the wireless data is correct but there is no signal strength, it is recommended to add the antenna extension cable so the antenna can be placed where better reception is received. Or consider relocating the PC500/550 if the problem persists.	On the Diagnostics page of the PC500/550 UI, press the **Get Wireless Data** button to display all wireless data. If all of the wireless data is correct but there is no signal strength, it is recommended to add the antenna extension cable so the antenna can be placed where better reception is received. Or consider relocating the PC500/550 if the problem persists.

Possible Cause	Corrective Action	
	GSM Modem	CDMA Modem
There has been a wireless modem failure.	Reboot the device. Follow the procedure above. If the problem persists, contact your local distributor.	Reboot the device. Follow the procedure above. If the problem persists, contact your local distributor.

8.1.6 ⚠ Code 4337 – SIM Card Not Detected/SIM Card Error

The PC500/550 with a GSM modem has a SIM card that is not detected by the modem, or communication errors between the modem and the SIM card have been detected.

Possible Cause	Corrective Action
SIM card has not been placed properly in the wireless modem.	Make sure the SIM card is inserted in the correct orientation and fully pushed into the SIM card slot on the PC500/550.
Wireless modem is having communication problems with the SIM card.	Reboot the PC500/550 and acknowledge the fault. If the problem persists, replace the SIM card with a new SIM card. If the problem continues, contact your local distributor.

8.1.7 ⚠ Code 4341 – External Memory Read/Write Error

The PC500/550 is having problems reading or writing data to the SD card or USB drive.

Possible Cause	Corrective Action
SD card or USB drive has not been inserted properly.	Verify that the SD card or USB drive is inserted properly into the PC500/550.
Defective SD card.	On the Data Log Preferences page in the Setup menu of the PC500/550 UI, verify that SD Storage has been selected as the memory device for data log storage. If the problem persists, reselect SD Storage by first selecting and saving Internal Storage as the memory device for data log storage, then select and save the SD Storage option. If the problem is not corrected, replace the SD card. If the problem continues, contact your local distributor.
Defective USB drive.	On the Data Log Preferences page in the Setup menu of the PC500/550 UI, verify that USB Storage has been selected as the memory device for data log storage. If the problem persists, reselect USB Storage by first selecting and saving Internal Storage as the memory device for data log storage, then select and save the USB Storage option. If the problem is not corrected, replace the USB drive. If the problem continues, contact your local distributor.

8.1.8 ⚠ Code 4342 – Configured Data Log Storage Device (SD/USB) is Removed

The PC500/550 has an SD card or USB drive selected as the storage method and the PC500/550 is not detecting the selected hardware.

Possible Cause	Corrective Action
The SD card or USB drive has been removed from the PC500/550 while the storage device was in use.	1. Make sure that if SD card or USB drive is selected as the storage method in the UI, that there is an SD card or USB drive inserted into the PC500/550. 2. Verify that the SD card or USB drive is inserted properly into the PC500/550. 3. On the Data Log Preferences page in the Setup menu of the PC500/550 UI, verify that SD Storage or USB Storage has been selected as the memory device for data log storage. 4. If the problem persists, reselect SD Storage by first selecting and saving Internal Storage as the memory device for data log storage, then select and save the SD Storage option. 5. If the problem is not corrected, replace the SD card. 6. If the problem continues, use the Internal Storage option and contact your local distributor.

8.1.9 ⚠ Code 4343 – Storage Space is Almost Full

The PC500/550 has less than 30% of storage space available for data logging.

Possible Cause	Corrective Action
Internal memory of the PC500/550 is being used for data logging and less than 30% of the memory is available.	This event notifies the user that storage space is nearing capacity. No action is required. Once 90% storage capacity is reached, 30% of the oldest data log records are erased. To acknowledge this event from the UI, an external memory device (SD card or USB drive) needs to be used.
SD card or USB drive is being used for data logging and the available free space in the drive is less than 30%.	This event notifies the user that storage space is nearing capacity. No action is required. Once 90% storage capacity is reached, 30% of the oldest data log records are erased. To acknowledge this event from the UI, the SD card or USB drive needs to be replaced. ***NOTICE*** **The PC500/550 erases all existing data on the external memory device before using it; therefore, to avoid data loss, a new or empty storage device should be used.**

8.1.10 ⚠ Code 4344 – Storage Space is Full

Memory space is full and the oldest log files are now being overwritten with new data.

Possible Cause	Corrective Action
The data logging space on the PC500/550 has reached maximum capacity.	This event notifies the user that storage space has reached maximum capacity and that 30% of the oldest data log records have been deleted.

8.1.11 Code 4351 – AUX102 Not Detected

The AUX102 is configured in the PC500/550 but it is not detected.

Possible Cause	Corrective Action
The AUX102 is configured in the PC500/550 UI but is not physically connected to the AUX101.	Physically connect the AUX102 to the AUX101.
There is a bad connection between the AUX101 and AUX102.	Verify the connection between the AUX101 and AUX102.
Bad AUX101 or AUX102 module.	Verify active communication between the AUX101 and the PC500/550 by looking at LEDs DS1 and DS2 on the AUX101. DS1 should be illuminated green and DS2 should not be illuminated. Also, verify that AUX101 is in Modbus mode ("H" is displayed on AUX101 LED display). If no communication error is present and the problem persists, connect the AUX101 to a Modbus analyzer like ModScan and verify information is received from the AUX101 module. If AUX101 information is present but there is no AUX102 information, replace the AUX102.

8.1.12 Code 4355 – Software Update Successful

A software update was performed on the PC500/550 and the update was done successfully.

Possible Cause	Corrective Action
PC500/550 software update was successful.	This event notifies the user that software has been successfully updated. To acknowledge the event and prevent this code from being displayed on the UI System Status bar, select the Event Log page and click on the green check box in the Acknowledge column for this event. This event is moved to the Acknowledged Events tab.

8.1.13 Code 4356 – Software Update Failed

A software update was performed on the PC500/550 and an error occurred.

Possible Cause	Corrective Action
Incorrect software file used to update software on the PC500/550.	Verify that the latest software file from the INCAL website is being uploaded. **⚠ CAUTION** ***Uploading the wrong software file can cause permanent damage to the PC500/550. Make sure to upload the correct file.***
A power interruption occurred during the software update.	Upload the correct software file again and ensure that there is no interruption to the system during this process.

8.1.14 Code 4357 – System Error

A critical issue within the PC500/550 operating system.

Possible Cause	Corrective Action
Corrupted software.	Reset the device. If the fault does not clear, upload the latest software version to the device. If the issue persists, contact your local distributor. Replacement of the device may be required.

8.1.15 ⚠ Code 4594 – <Sensor> has High Warning

The PC500/550 has detected that the value of an analog configurable input for the sensor shown in the event description has reached the preset high warning threshold.

Possible Cause	Corrective Action
The sensor shown in the event description has reached the preset high warning threshold.	Identify the sensor that is triggering the alarm and take corrective action.
The sensor that is triggering the fault may be damaged.	If the sensor is triggering the fault but the event is not occurring, verify the performance of the sensor. The sensor may be damaged and may need to be replaced.

8.1.16 ⚠ Code 4595 – <Sensor> has Low Warning

The PC500/550 has detected that the value of an analog configurable input for the sensor shown in the event description has reached the preset low warning threshold.

Possible Cause	Corrective Action
The sensor shown in the event description has reached the preset low warning threshold.	Identify the sensor that is triggering the alarm and take corrective action.
The sensor that is triggering the fault may be damaged.	If the sensor is triggering the fault but the event is not occurring, verify the performance of the sensor. The sensor may be damaged and may need to be replaced.

8.1.17 ⚠ Code 4596 – <Sensor> Voltage Above Critical High Threshold

The PC500/550 has detected that the sensor shown in the event description is sending a higher than acceptable voltage to the analog configurable input that is being used.

Possible Cause	Corrective Action
A sensor that is out of specification is being used for this application.	If the sensor is connected to an analog input on the AUX101/102, reference the specifications sheet of the sensor and verify that the specifications are compatible with the AUX101/102 input being used. Compare the specification for each input to the specifications in the AUX101/102 Owner Manual (A030K737). If using an analog input on the PC500/550, make sure that a resistive sensor with a range of 600–2500 Ohms is being used.
Damaged sensor.	Verify the specification sheet of the sensor that is being used and measure the output voltage of the sensor. If the values are not within specification, the sensor may be damaged and may need to be replaced.

8.1.18 ⚠ Code 4597 – <Sensor> Voltage Below Critical Low Threshold

The PC500/550 has detected that the sensor shown in the event description is sending a lower than acceptable voltage to the analog configurable input that is being used.

Possible Cause	Corrective Action
A sensor that is out of specification is being used for this application.	If the sensor is connected to an analog input on the AUX101/102, reference the specifications sheet of the sensor and verify that the specifications are compatible with the AUX101/102 input being used. Compare the specification for each input to the specifications in the AUX101/102 Owner Manual (A030K737). If using an analog input on the PC500/550, make sure that a resistive sensor with a range of 600–2500 Ohms is being used.
Damaged sensor.	Verify the specification sheet of the sensor that is being used and measure the output voltage of the sensor. If the values are not within specification, the sensor may be damaged and may need to be replaced.

8.1.19 Code 5138 – Genset Control Not in Auto

Provides notification that the status of a generator set has changed from Auto mode to Not in Auto.

8.1.20 Code 5139 – Auto Transfer Switch Not in Auto

Provides notification that the status of an ATS has changed from Auto mode to Not in Auto.

8.1.21 Code 5141 – Source 1 Connected

Provides notification of the current connection status of source 1 for a specific ATS.

8.1.22 Code 5142 – Source 2 Connected

Provides notification of the current connection status of source 2 for a specific ATS.

8.1.23 Code 5143 – Genset Running

Provides notification that a specific generator set is now in running mode.

8.1.24 Code 5144 – Genset Stopped

Provides notification that a specific generator set has changed status from running mode to stopped.

8.1.25 ⚠ Code 5341 – <Sensor> is Active

Indicates that a discrete sensor attached to an input on the PC500/550 or AUX101/102 is in an active state.

Possible Cause	Corrective Action
The contact on the sensor sends a signal to the PC500/550 or AUX101/102 has changed position due to normal operation, indicating that a change has occurred on the system it is sensing.	Identify what the sensor is connected to and take the proper corrective action.
The configuration in the PC500/550 UI does not match the type of contact being used in the sensor.	If a normally open contact is used in the sensor sending the ground signal to the PC500/550 discrete input or AUX101/102 discrete inputs, the trigger mode for that sensor should be configured as active low. If a normally closed contact is being used, the trigger mode for the sensor should be configured as active high.

8.1.26 ⚠ Code 5342 – <Sensor> is Inactive

Indicates that a discrete sensor attached to an input on the PC500/550 or AUX101/102 is in an inactive state.

Possible Cause	Corrective Action
The action reported by the sensor has been corrected and the sensor is back to a normal state.	No action is necessary. The event is triggered when the trigger mode for the sensor is configured as State Change. The PC500/550 triggers events when the sensor state transitions to both the active and inactive states.

8.2 Symptom Based

Diagnosis of some problems involves observing system operation.

8.2.1 Cannot Access the PC500/550 User Interface

Possible Cause	Corrective Action
The PC500/550 lost power.	Verify that the green power LED on the PC500/550 is solidly on. If the power LED is not on, check the voltage between TB1-1 and TB1-2. The voltage should be in a range between 9 and 32 VDC. If the voltage is out of range, check the status of the power supply and troubleshoot the interconnection wire accordingly.
The local network to which the PC500/550 is connected is currently down.	Contact your IT administrator or Internet provider to verify the status of the network. At least a 10x100 Mbit service is required in order to have a good connection speed to the PC600/550 user interface.
PC500/550 locked up due to an abnormal condition.	Cycle power and/or reset the PC500/550. This can be done by disconnecting the ground cable on TB1-2 and/or pushing the **Reset** button, respectively. Allow the PC500/550 to boot up completely after cycling power before trying to log in to the user interface. This process may take up to 10 minutes.

Possible Cause	Corrective Action
PC500/550 lost connection to the Internet and/or network settings have changed.	1. Make sure the Ethernet cable is properly connected to the PC500/550, the green LED on the Ethernet port is solidly illuminated, and the amber LED is blinking; indicating active communication. 2. Connect to the PC500/550 using the USB-OTG cable (see Section 2 of the *Quick Setup Guide* (A040G393) and verify IP settings in the Network Settings Setup menu (windows mobile device center will have to be installed in the computer that will connect to the PC500/550 via the USB-OTG cable). Make sure the IP address used to login to the UI is the same as the one set up on the Network Settings Setup menu. In addition, verify the gateway and Subnet mask settings. Contact your IT department or Internet provider for questions about the proper settings.

8.2.2 User Interface Taking Too Much Time to Load

Possible Cause	Corrective Action
The PC500/550 may be locked up due to an unexpected event.	Cycle power and/or reset the PC500/550. This can be done by disconnecting the ground cable on TB1-2 and/or pushing the **Reset** button, respectively. Allow the PC500/550 to boot up completely after cycling power before trying to log in to the user interface. This process may take up to 10 minutes.
Internet service problem.	Verify that the Internet bandwidth of the network where the PC500/550 is located has at least 1 Mbps of download speed. Verify that the network to which the PC that is being used to dial in to the PC500/550 is connected and has at least 1 Mbps of download speed. ***NOTICE*** **There are multiple websites that can be used to run this type of test, such as www.speedtest.net.**

8.2.3 PC500/550 Not Displaying Correct Information on User Interface

Possible Cause	Corrective Action		
	PCC1301, PCC1302, PCC2300, and PCC3300 Controls	**PCC2100, PCC3100, PCC3200, PCC3201, and ATS Controls**	**Remote I/Os**
The device that is being monitored is not configured properly.	On the Device Configuration page in the Setup menu of the UI, identify the generator set with incorrect readings in the Device Name column. Verify that the Device Model column is the correct model for the control of the device. If the model is not correct, select the generator set that is displaying incorrect information and select **Edit** to make the proper changes.	On the Device Configuration page in the Setup menu of the UI, identify the generator set or ATS with incorrect readings in the Device Name column. Verify that the Device Model column is the correct model for the control of the device. If the model is not correct, select the generator set or ATS that is displaying incorrect information and select **Edit** to make the proper changes.	On the Device Configuration page in the Setup menu of the UI, identify the AUX with incorrect readings in the Device Name column. Select the AUX device and select **Edit** to verify that the inputs of the AUX module are configured according to the type of sensor that is being used on each of the different inputs.
Calibration of a control needs to be updated.	Connect the control that is displaying incorrect information to Modbus master software, such as ModScan. Use the *Modbus Register Mapping* (A029X159) manual to understand the meaning of each Modbus register. If the registers do not match what is displayed for the generator set in the UI, use the latest available calibration from the INCAL website and perform an calibration update on the generator set control.		
Control has incorrect Modlon index.		Open the LonWorks database that was used to commission the generator sets and ATSs with LonWorks cards. Verify what equipment is commissioned as Gen1, Gen2, etc.; and ATS1, ATS2, etc., on the Modlon template. Make sure that the UI index numbers are assigned correctly (Gen1 has an index number, Gen2 has index of 1, and so on; and the same for ATSs.	

Possible Cause	Corrective Action		
	PCC1301, PCC1302, PCC2300, and PCC3300 Controls	PCC2100, PCC3100, PCC3200, PCC3201, and ATS Controls	Remote I/Os
Sensor is not configured properly.			On the Sensors and Output Controls page in the Setup menu of the UI, select the sensor that is displaying wrong information. Verify that the sensor type (analog or discrete) is correct. Select **Edit** to verify the configuration of the sensor. Make sure the sensor has the correct units for what is being measured and that the sensor voltage limits are set properly for what the sensor is sending to the AUX101/102.

8.2.4 Report Generation Taking Too Long or Reports Not Generated

Possible Cause	Corrective Action
The PC500/550 may be locked up due to an unexpected event.	Cycle power and/or reset the PC500/550. This can be done by disconnecting the ground cable on TB1-2 and/or pushing the **Reset** button, respectively. Allow the PC500/550 to boot up completely after cycling power before trying to log in to the user interface. This process may take up to 10 minutes.
Internet service problem.	Verify that the Internet bandwidth of the network where the PC500/550 is located has at least 1 Mbps of download speed. Verify that the network to which the PC that is being used to dial in to the PC500/550 is connected and has at least 1 Mbps of download speed. ***NOTICE*** **There are multiple websites that can be used to run this type of test, such as www.speedtest.net.**

8.2.5 Email Notifications Not Delivered When Event Happens

Possible Cause	Corrective Action
DNS server not configuration properly.	On the Network Settings page in the Setup menu of the UI, verify that a valid DNS server is being used. Contact the IT department or Internet provider with any questions about what DNS server should be used.
SMTP server not configured properly.	On the Mail Settings page in the Setup menu of the UI, verify that the correct SMTP server address and port are being used. This information can be obtained from the IT department or Internet provider. Once verified, send a test email from the Mail Settings page by selecting **Test Email** and enter the email address to which the email should be sent.
User information is not set up correctly on the User Settings page in the Setup menu of the UI.	On the User Profile Settings page in the Setup menu of the UI, verify that all the desired users are added under the Users tab. Make sure that the information for the user has been entered correctly.
User is not added to the user group configured to receive notifications.	On the User Profile Settings page in the Setup menu of the UI, select the User Groups tab and verify that a user group has been created. If so, select the **View All Members** link for the group to verify that all users that need to receive notifications are in the group.
Notifications are not configured properly.	On the Notifications page in the Setup menu of the UI, verify that a user group has been configured. If not, navigate to the User Profile Settings page in the Setup menu to enter a user group. If a user group has been entered, select the user and select **Edit** to verify that Email is selected as a method to receive notifications. If so, on the Notifications page, verify that the desired Device Name and Event Type(s) have been entered, and that the notification has been enabled. Once verified, send a test email from the Notifications page by selecting **Test Email** and enter the email address to which the email should be sent.

8.2.6 Text Notifications Not Delivered When Event Happens

Possible Cause	Corrective Action	
	GSM Modem	CDMA Modem
User information is not set up correctly on the User Settings page in the Setup menu of the UI.	On the User Profile Settings page in the Setup menu of the UI, verify that all the desired users are added under the Users tab. Make sure that the information for the user has been entered correctly.	On the User Profile Settings page in the Setup menu of the UI, verify that all the desired users are added under the Users tab. Make sure that the information for the user has been entered correctly.
User is not added to the user group configured to receive notifications.	On the User Profile Settings page in the Setup menu of the UI, select the User Groups tab and verify that a user group has been created. If so, select the **View All Members** link for the group to verify that all users that need to receive notifications are in the group.	On the User Profile Settings page in the Setup menu of the UI, select the User Groups tab and verify that a user group has been created. If so, select the **View All Members** link for the group to verify that all users that need to receive notifications are in the group.
If using a prepaid service, credit for the wireless service may be used up or expired.	Contact the wireless provider to verify the credit of the SIM card being used.	

Possible Cause	Corrective Action	
	GSM Modem	**CDMA Modem**
Notifications are not configured properly.	On the Notifications page in the Setup menu of the UI, verify that a user group has been configured. If not, navigate to the User Profile Settings page in the Setup menu to enter a user group. If a user group has been entered, select the user and select **Edit** to verify that SMS/Text is selected as a method to receive notifications. If so, on the Notifications page, verify that the desired Device Name and Event Type(s) have been entered, and that the notification has been enabled. Once verified, send a test SMS from the Notifications page by selecting **Test SMS** and enter the mobile number to which the text should be sent.	On the Notifications page in the Setup menu of the UI, verify that a user group has been configured. If not, navigate to the User Profile Settings page in the Setup menu to enter a user group. If a user group has been entered, select the user and select **Edit** to verify that SMS/Text is selected as a method to receive notifications. If so, on the Notifications page, verify that the desired Device Name and Event Type(s) have been entered, and that the notification has been enabled. Once verified, send a test SMS from the Notifications page by selecting **Test SMS** and enter the mobile number to which the text should be sent.

This page is intentionally blank.

9 Parts Information

9.1 Standard Parts

Part Number	Description	Quantity
A034H143	Antenna	1
	PowerCommand 500 (includes A034X336, A031C194, and A035H285)	1
A040X126	PC500LAN	1
A040X127	PC500GSM	1
A040X129	PC500CDMA	
	PowerCommand 550 (includes A034X336, A031C194, and A035H285)	1
A040K848	PC550LAN	1
A040K850	PC550GSM	1
A040K853	PC550CDMA	
A034X336	Connector, 14 Pin (TB1)	1
A031C194	Connector, 9 Pin (TB2)	1
A035H285	Battery, 3V Lithium Coil Cell	1
A035C393	USB OTG Cable	1
A035C395	Ethernet Cable	1

9.2 Conditional Parts

Part Number	Description	Quantity
0541–1149*	ModLon II Gateway Kit	1
A040T087*	Modbus Connection Cable (DB9 to 2-Wire)	1
A035C381[+]	Antenna Extension	1

* Used for installations with legacy controls: PCC2100, PCC3100, PCC3200, PCC3201 generator set controls and OTPC, BTPC, OHPC, and CHPC transfer switch controls.

[+] Used for installations in metal cabinets.

This page is intentionally blank.

10 Real-Time Clock Battery Replacement

Before performing this procedure, make sure that there is no remote start or remote test send from the PC500/550 to a generator set or ATS.

1. Disconnect all terminal blocks, cables, and antenna extension cable from the PC500/550.
2. Remove the 4 screws on the back of the PC500/550 and remove the cover.

⚠ CAUTION
Electrostatic discharge can damage circuit boards. Always wear a grounding wrist strap when handling circuit boards.

3. Remove the nut for the antenna extension cable.

4. Remove the circuit board from the enclosure by disconnecting the 2 clamps that secure the circuit board to the enclosure, one at a time, and pulling the circuit board up as the retaining clamps are being disconnected.

5. On the removed circuit board, carefully push the TRC battery out of the retainer with a small screwdriver.

⚠ CAUTION
Pushing on the battery too hard can damage the soldering of the battery retainer. Take extra precaution when removing the battery.

6. Insert the new battery and reassemble the PC500/550.

Appendix A. External Connectivity Diagrams

Table of Contents

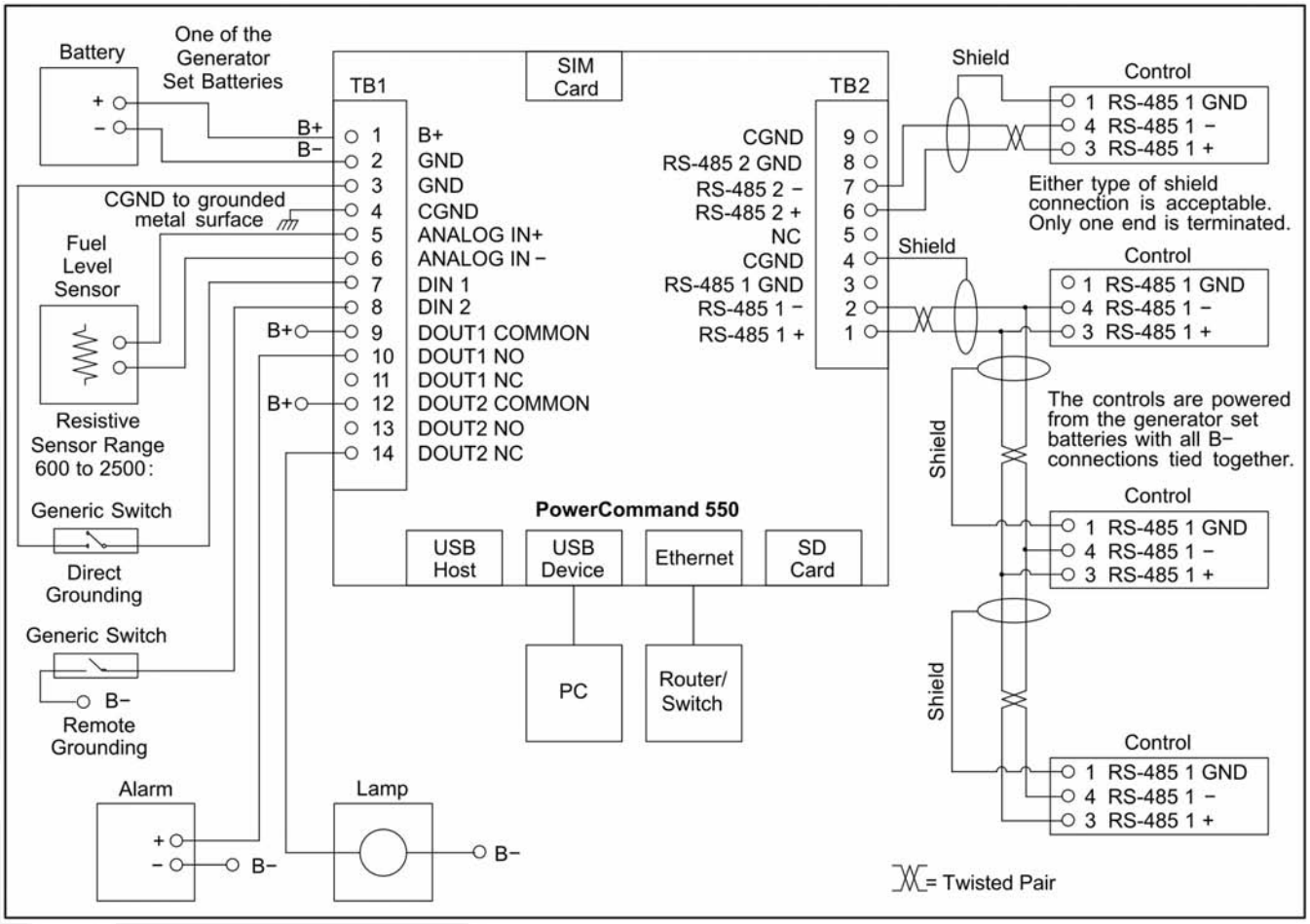


FIGURE 84. COMMON POWER SUPPLY

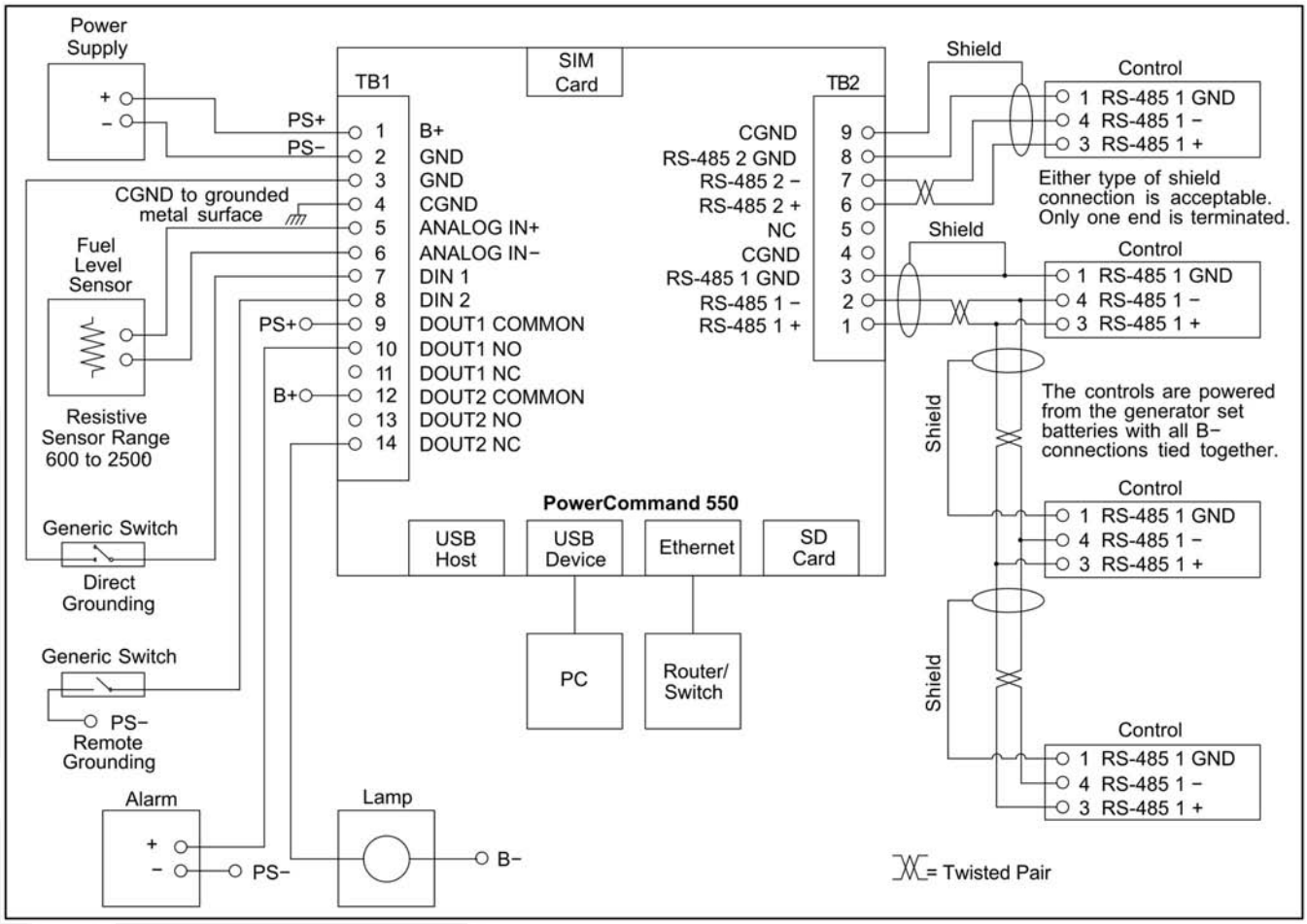


FIGURE 85. SEPARATE POWER SUPPLY

This page is intentionally blank.

www.cumminspower.com