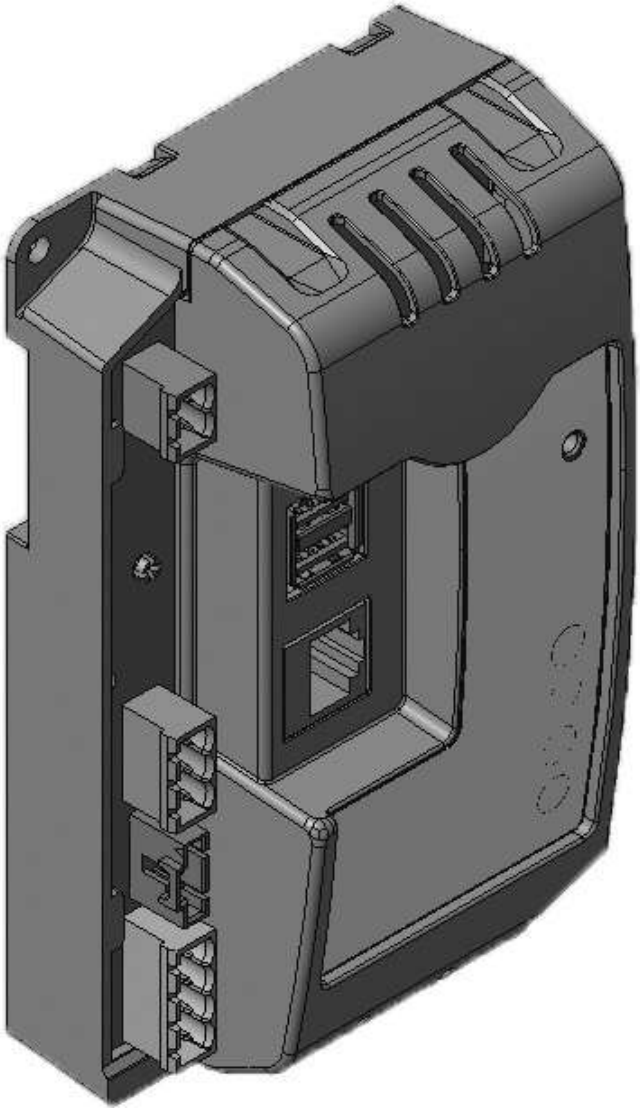
GENERAC®

Owner's Manual

Power Zone® Gateway

for use with Power Zone 410



SAVE THIS MANUAL FOR FUTURE REFERENCE

⚠WARNING

CANCER AND REPRODUCTIVE HARM
www.P65Warnings.ca.gov.

(000393a)

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Section 1: Introduction and Safety

Introduction

Thank you for purchasing a Generac Power Systems, Inc. product. This unit has been designed to provide high performance, efficient operation and years of use when maintained properly.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Read This Manual Thoroughly

⚠WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

If any section of this manual is not understood, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit ***www.generac.com*** for starting, operating, and servicing procedures. The owner is responsible for correct maintenance and safe use of the unit.

This manual must be used in conjunction with all other supporting product documentation supplied with the product.

SAVE THESE INSTRUCTIONS for future reference. This manual contains important instructions that must be followed during placement, operation, and maintenance of the unit and its components. Always supply this manual to any individual that will use this unit, and instruct them on how to correctly start, operate, and stop the unit in case of emergency.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The alerts in this manual, and on tags and decals affixed to the unit, are not all inclusive. If using a procedure, work method, or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others and does not render the equipment unsafe.

Throughout this publication, and on tags and decals affixed to the unit, DANGER, WARNING, CAUTION, and NOTE blocks are used to alert personnel to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Alert definitions are as follows:

⚠DANGER

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

(000001)

⚠WARNING

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

(000002)

⚠CAUTION

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

(000003)

NOTE: Notes contain additional information important to a procedure and will be found within the regular text of this manual.

These safety alerts cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

The operator is responsible for proper and safe use of the equipment. The manufacturer strongly recommends that if the operator is also the owner, to read the owner's manual and thoroughly understand all instructions before using this equipment. The manufacturer also strongly recommends instructing other users on how to properly start and operate the unit. This prepares them if they need to operate the equipment in an emergency.

General Hazards

⚠WARNING

Equipment damage. Only qualified service personnel may install, operate, and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage. (000182a)

Electrical Hazards

⚠DANGER

Electrocution. Contact with bare wires, terminals, and connections while generator is running will result in death or serious injury. (000144)

⚠DANGER

Electrocution. Verify electrical system is properly grounded before applying power. Failure to do so will result in death or serious injury. (000152)

⚠DANGER

Electrocution. Do not wear jewelry while working on this equipment. Doing so will result in death or serious injury. (000188)

⚠DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury. (000104)

⚠DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury. (000145)

⚠WARNING

Electrocution. Potentially lethal voltages are generated by this equipment. Render the equipment safe before attempting repairs or maintenance. Failure to do so could result in death or serious injury. (000187)

⚠WARNING

Electrocution. More than one live high voltage circuit is present. Disconnect all power sources before servicing. Failure to do so could result in death or serious injury. (000563)

⚠WARNING

Electric shock. Only a trained and licensed electrician should perform wiring and connections to unit. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage. (000155a)

Section 2: General Information

Equipment Description

The Generac Power Zone Gateway (Assembly No. A0002163973) is a user interface for the Power Zone system. The Gateway can be used in applications other than generator control.

Symbol Definition

	AC Generator
	AC Voltage
	DC Voltage

Standard Features

- AUTO/OFF/MANUAL Indication
- Not in AUTO Indication
- Alarm Acknowledge Button
- Multi-Lingual
- On Screen Editable Parameters
- Key Function Monitoring
  - Three Phase Voltage, Amperage, kW, kVA, and kVAR
  - Voltage Frequency
  - Engine Speed
  - Engine Coolant Temperature
  - Engine Oil Pressure
  - Engine Oil Temperature
  - Battery Voltage
  - Warning and Alarm Indication
  - Maintenance Events/Information
  - Engine Hourmeter

Codes and Standards

- UL 2200
- ANSI/CAN/ULC 6200: ETL approval
- CE Mark
- RoHS Compliant

Specifications

Environmental Specifications	
Operating Temperature	-40 °F (-40 °C) to 140 °F (60 °C)
Humidity	5% to 90% non-condensing
Enclosure	UL Type IP2X
Weight	0.5 lbs
Power Supply Requirements	
Power Supply Voltage	7 to 35 V⎓ (12 / 24 V⎓ nominal)
Power Supply Usage	0.5 A (maximum during power up)
Power Supply Cable	2 wires - 16 AWG recommended
Communication (Ethernet)	
Number of Ports	1
Communication Link	4 wires minimum of 8 pin connector - 2 wire Receive and 2 wire Transmit
Communication Cable	Cat5e – 2 twisted pairs
Maximum Cable Length	328 ft (100 m)
Baud Rate Auto-Detect	10/100 Mbps
Communication (RS-485)	
Number of Ports	2
Communication Link	2 wires
Communication Cable	3 wires - shielded twisted pair and ground
Maximum Cable Length	4,000 ft (1,219 m)
Baud Rate	Up to 115.2 kbps
Maximum Number of Devices	32
Protocol/Device Type	Modbus / 1 Master and 1 Slave
Communication (USB)	
Number of Ports	2
Connector	Type A
USB version	USB 1.1/2.0
Maximum Cable Length	16.5 ft (5 m)
Baud Rate	12 Mbps, 480 Mbps
LED	
Number of LEDs	2
Color	Red and green

NOTE: The Ethernet, RS-485, and USB cables should not be run in the same conduit or in the same wire grouping as any high voltage or high current conductors.

NOTE: The RS-485 settings such as baud rate should be selected to be compatible with other components that are connected to the RS-485 bus.

Connection Locations

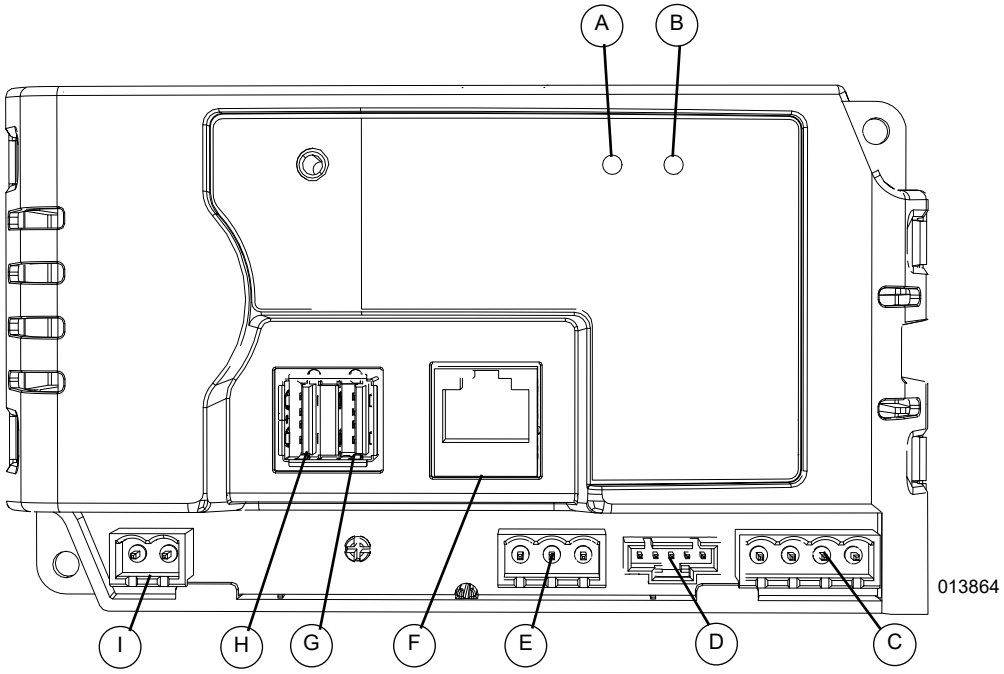

Figure 2-1. Connection Locations (Bottom View)

A	Communication LED (Green)	**D**	Power and RS-485 Connector (Gen. Controller)	**G**	USB 1 Connection
B	Power LED (Red)	**E**	Aux RS-232 Port	**H**	USB 2 Connection
C	Aux RS-485 Port	**F**	Ethernet Connection	**I**	Aux Power Connection (Common with D)

NOTE: See ***Connection Details*** for more information regarding the connections and LEDs.

Dimensions

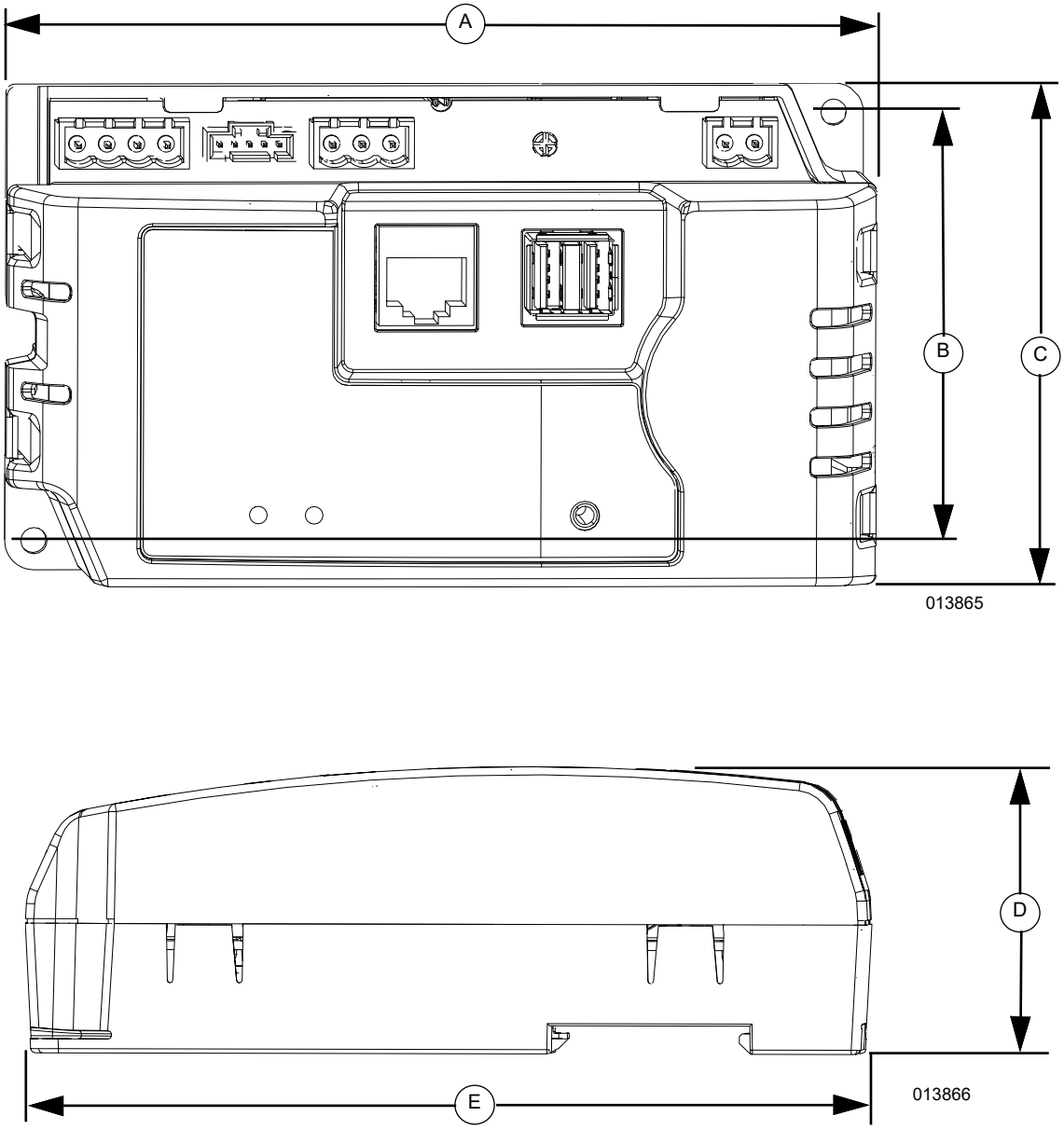

Figure 2-2. Gateway Enclosure Dimensions

A	5.39 in (136.8 mm)	**D**	2.0 in (51 mm)
B	2.89 in (73.3 mm)	**E**	5.87 in (149 mm)
C	3.36 in (85.5 mm)		

Section 3: Installation and Operation

⚠WARNING

Equipment damage. Only qualified service personnel may install, operate, and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage.

(000182a)

Cleaning

Do not use any cleaning solution to clean the Gateway enclosure or cover. Clean with a damp cloth or sponge. The Gateway contains electronic circuitry. Use extra caution not to drip water inside the Gateway. If water or other liquid enters the Gateway, disconnect power until completely dry.

Connection Details

Connector	Description	Purpose	Wire # (Default)
PWR_RS485-5	12 V ⎓	Provides power to the Gateway	15F
PWR_RS485-4	Ground		0C
PWR_RS485-3	RS-485 Ground	This is Modbus Master and is used to connect to Power Zone 410 Controller	0B
PWR_RS485-2	RS-485 -		393
PWR_RS485-1	RS-485 +		392
Ethernet	RJ-45 Ethernet connector	Used to connect to PC, BMS, or other external device	–
USB	Universal Serial Bus Type A connector	Can be used for external add on USB devices or modules	–

Light Emitting Diodes (LEDs)

There are two LEDs at the front on the enclosure:

- Red LED: Represents system power.
  - If red LED is on, Gateway is powered.
  - If red LED is off, Gateway is not powered.
- Green LED: Represents RS-485 (only) communication status.
  - If green LED is blinking, RS-485 communication is working properly. The blinking rate will be 0.25 seconds on and 0.25 seconds off (2 Hz).
  - If green LED is off, RS-485 communication is not working properly or RS-485 interface is not connected.

Connecting to the Gateway

The Gateway can be accessed via Ethernet.

Ethernet Connection

1. To connect via Ethernet, the Ethernet IP Address is required. This information can be accessed via the Power Zone 410's Display. See ***Technical Manual Power Zone Controller*** for further details.

NOTE: The IP address and subnet mask on your PC's Ethernet port must be set to a fixed IP address in the same subnet range as the IP address of the Gateway.

2. Connect Ethernet cable from the Gateway to the PC.
3. Open a web browser (Google Chrome™ preferred) and enter the Ethernet IP address in the top bar of the browser. After a few minutes, the web browser should display the Generac app.

Home Screen

See ***Figure 3-1***. This screen displays bar graphs for the most common measurements, and an overall health check for the generator. The number of displayed measurements will change depending on whether or not the generator is running.

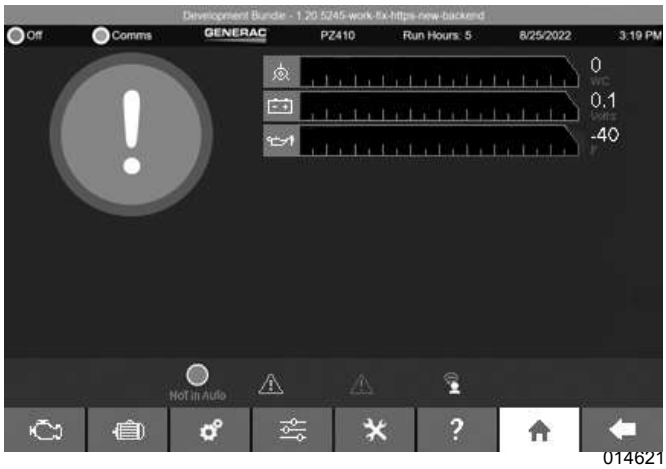

Figure 3-1. Home

Screen Layout

See ***Figure 3-2***. The screen is divided into the ***Top Banner*** (A), the ***Bottom Banner*** (B), and the main screen information area in the center (C). The top and bottom banners are displayed on every screen.

Figure 3-2. Screen Layout

Top Banner

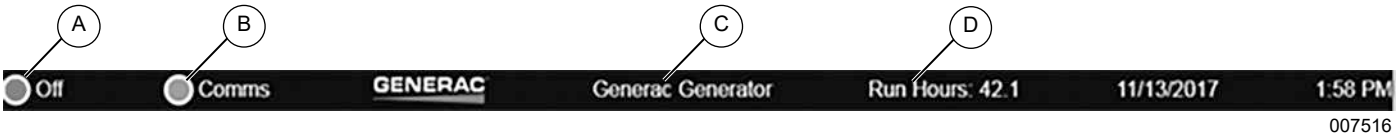

Figure 3-3. Top Banner Features

(A) Keyswitch Status

A red LED indicates the key is in the OFF position. A green LED indicates the key is in the AUTOMATIC position. An orange LED indicates the key is in the MANUAL position.

(B) Communications Health

A blinking green LED indicates the controller is responding to Modbus requests. A blinking red LED indicates the Main Controller is not responding to requests.

(C) Generator Name

Displays the name of the generator. The user can give the generator an easy to understand name such as “East”, “West”, or “Number 1”. See ***Figure 3-4***. To name the generator, go to Setup → Communications → Device Manager screen, press the Edit button (E) and enter the Friendly Name.

(D) Run Hours

Displays the total number of hours the generator has been run.

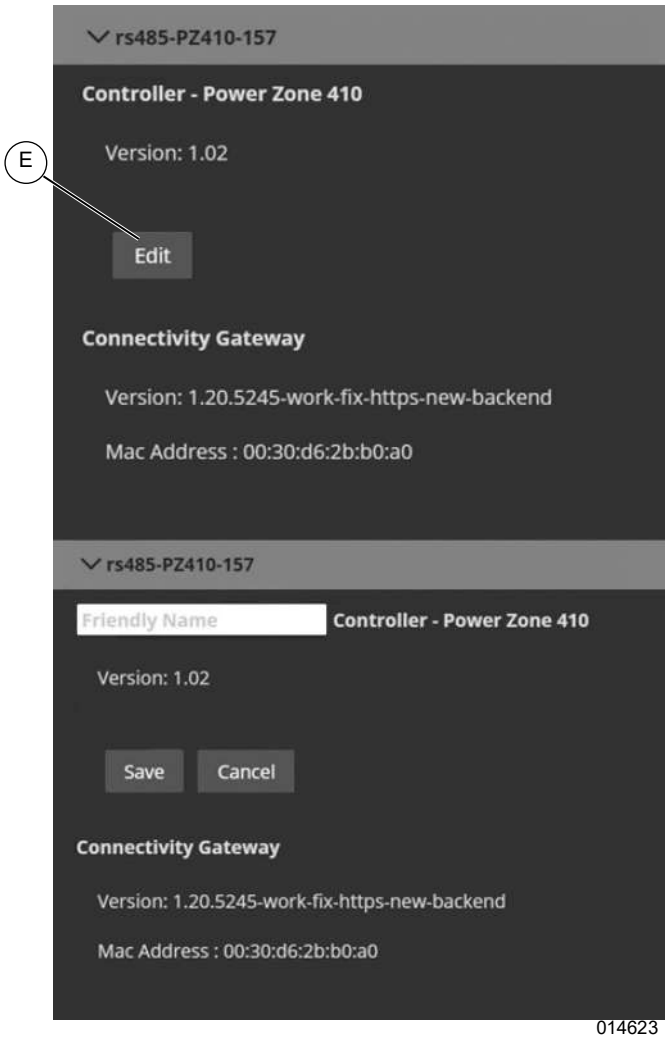

Figure 3-4. Edit Generator Name

Bottom Banner

See ***Figure 3-5***. All of the displays and features of Power Zone are accessed via a nested menu system. Navigation is performed by selecting the relevant icon at the bottom of the screen. The icons are always visible and include a BACK icon to navigate back to the top layer. Hovering the mouse over the icon will display a “tool tip” above the icon describing its function.

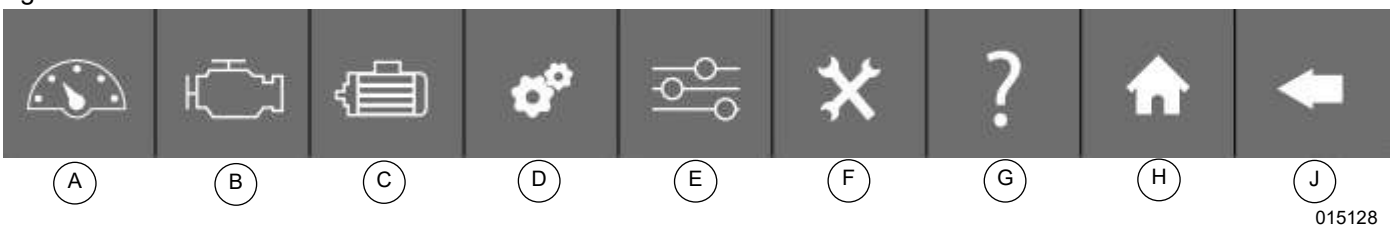

Figure 3-5. Bottom Banner Features

(A) Dashboard

This icon displays bargraphs for the most common system information and provides access to the following submenus:

- ON/OFF Status
- Current alarms and warnings
- Maintenance Notes
- TX status

(B) Engine

This icon provides access to the bargraphs showing engine related information. The submenu allows editing of engine related configuration parameters.

(C) Alternator

This icon provides access to the bargraphs showing alternator related information. The submenu allows editing of alternator related configuration parameters.

(D) System

This icon provides access to information such as alarm history, system notes, dealer information, and nameplate data.

(E) Setup

This icon provides access to the setup submenu. The setup submenus allow editing for language and units selection, system setup, AMF, enabling alarms, date/time setting, exercise setup, and communications setup.

(F) Tools

This icon provides access to items for configuration file transfer, firmware updates, https configuration, and modbus reads.

(G) Help

This icon provides access to manuals, tips, and Frequently Asked Questions (FAQs).

(H) Home

This icon provides access to bargraphs for the most common measurements and an overall health check for the generator. The displayed measurements change depending on whether or not the generator is running.

(J) Back

This icon takes the user back to the previous screen.

Home Screen Bargraphs

See ***Figure 3-6***. The center of the screen contains data in the form of bargraphs. The color of the bar changes to yellow once the measurement triggers a warning (either high or low). The color of the bar changes to red once the measurement triggers an alarm. If a measured value exceeds the bargraph range, the bargraph is outlined in red.

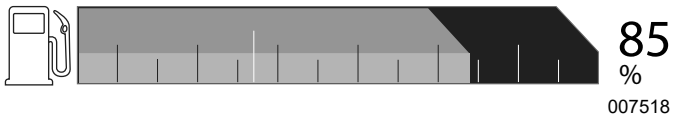

Figure 3-6. Bargraph

Alarm Ribbon

See ***Figure 3-7***. This area is hidden when there are no alarms or warnings. If an alarm or warning condition occurs, a “Ribbon” will be drawn across the lower portion of the screen showing the condition. Select the icon that appears to initiate a different action for each icon, as shown below.

Icon	Description
	Alarm (Red): Displays the Alarms and Warnings Screen
	Warning (Yellow): Displays the Alarms and Warnings Screen
	Alarm Horn Active: Silences the alarm horn
	Alarm Horn Silenced: No action
	Check Engine: No action
	Dealer Information: Displays the dealer information screen
	“Not in Auto” Icon (Red): Displays the AUTO/OFF/MANUAL screen

NOTE: The “Check Engine” icon is displayed only for emissions related Diagnostic Trouble Codes (DTCs). Normally, these DTCs cannot be cleared manually. They will clear when the system has met the required conditions for the required length of time or number of run cycles.

Figure 3-7. Alarm Ribbon

Screen Features

Scrolling

See ***Figure 3-8***. Use a mouse to move the scroll bars.

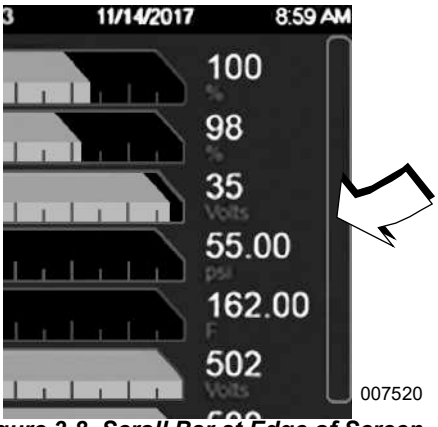

Figure 3-8. Scroll Bar at Edge of Screen

Language

See ***Figure 3-9***. The screen is designed to be multi-lingual. Each remote user can have a different language displayed without affecting the other remote users or the Controller Built-in Display. To set the language, go to the ***(E) Setup*** icon (on the bottom banner) choose “User” → “Language/Locale”. A drop down box for languages will appear on the right hand side. Select “Apply Changes” to save the language selection.

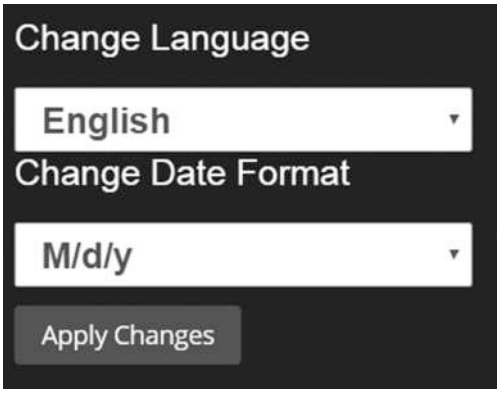

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Figure 3-9. Language Selection

Units of Measure

See ***Figure 3-10***. To set the units of measure go to the ***(E) Setup*** icon (on the bottom banner) and choose “User”. A selection for “Units of Measure” will appear on the right side of the screen. Checking the “Save” button will save the selection.

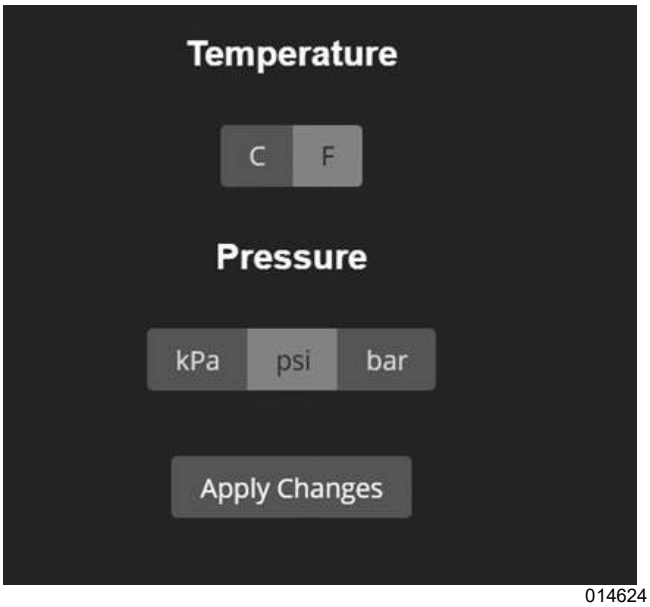

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Figure 3-10. Units of Measure

Date/Time

See ***Figure 3-11***. The system date and time can be set from the ***(E) Setup*** icon (on the bottom banner). Navigate to Setup → Calendar → Date/Time.

Changing the date/time on the Gateway means a change to the “System Time” and this will eventually change all other connected equipment (displays and modules) in the system. This will affect timestamps of data and execution of calendar based commands.
The default time setting shown on the Gateway is set via the date format setting on the controller built-in display.

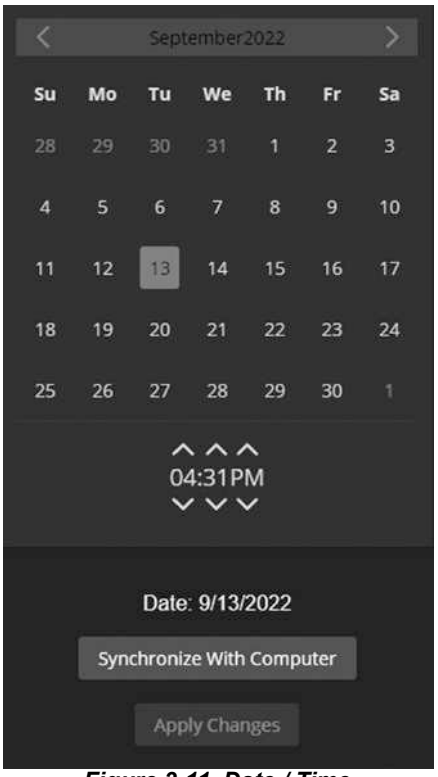

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Figure 3-11. Date / Time

Health Checkmark

See ***Figure 3-12***. The checkmark indicates the system is healthy.

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Figure 3-12. System is Healthy (Green)

See ***Figure 3-13*** and ***Figure 3-14***. When the generator has an alarm or warning status, the checkmark will change to indicate the level of fault.

Figure 3-13. Shutdown Alarm Condition (Red)

Figure 3-14. Warning Condition (Yellow)

Editing

Editing of configuration parameter values is performed by two methods: by entering a value (***Figure 3-15***) or selecting a value using the pull down selection box (***Figure 3-16***).

Figure 3-15. Numeric Value Editing (with ranges)

Figure 3-16. Pull Down Selection Box

Screen Icon Details

Home Screen

This screen displays bar graphs for the most common measurements, and an overall health check for the generator. The number of displayed measurements will change depending on whether or not the generator is running.

Maintenance Notes

See ***Figure 3-17***. This screen displays an editable file of maintenance notes. Click on the “Add” button to add notes and click the “Submit” button. The notes will appear below. “Routine Maintenance” has been added as shown in ***Figure 3-17***. The notes can be edited or deleted by choosing the edit or delete small icons on the notes.

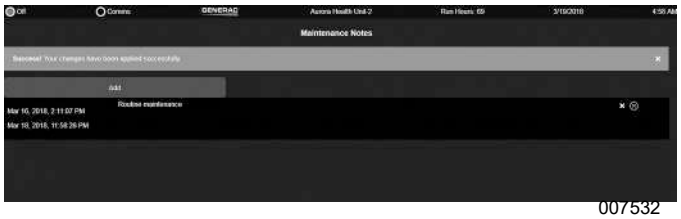

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Figure 3-17. Maintenance Notes

Engine Detail Screen

See ***Figure 3-18***. The Engine Detail Screen displays bargraphs of measured engine parameters. In some cases the readings will be empty if the associated sensors are not fitted. The engine screen also provides a button to access the Engine Settings screen. This screen allows editing of engine related configuration parameters.

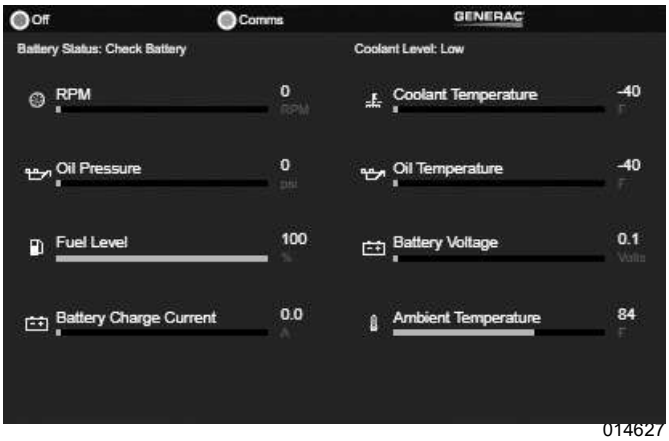

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Figure 3-18. Engine Screen

Engine Settings

See ***Figure 3-19***. The Engine Settings screen displays an icon for each entry on the left side of the entry. Click on the text field and enter a new value. The new value is entered and saved. If the value is out of range a red warning will display and prevent saving of data. The range will be displayed above the keyboard entry as shown in ***Figure 3-15***.

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Figure 3-19. Engine Settings

Alternator Detail Screen

See ***Figure 3-20***. The Alternator Detail Screen displays bargraphs of measured alternator parameters.The alternator screen provides a button to access the Alternator Settings screen. This screen allows editing of alternator related configuration parameters.

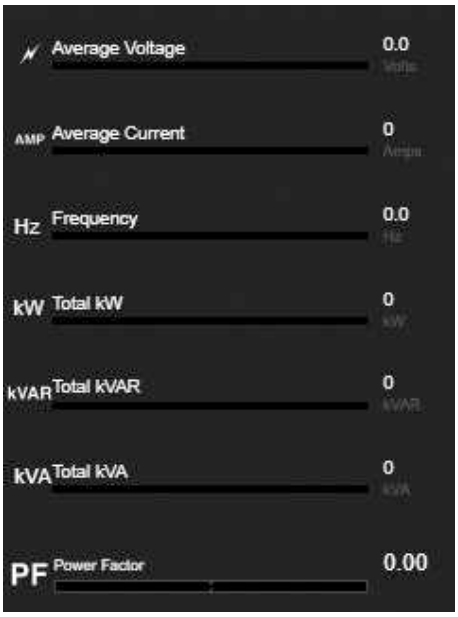

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Figure 3-20. Alternator Detail Screen

Alternator Settings

See ***Figure 3-21***. The Alternator Settings screen displays an icon for each entry on the left side of the screen. Click on the text field on the right and enter a new value. The new value is entered and saved. If the value is out of range a red warning will display and prevent saving of data. The range will be displayed above the keyboard entry as shown in ***Figure 3-15***.

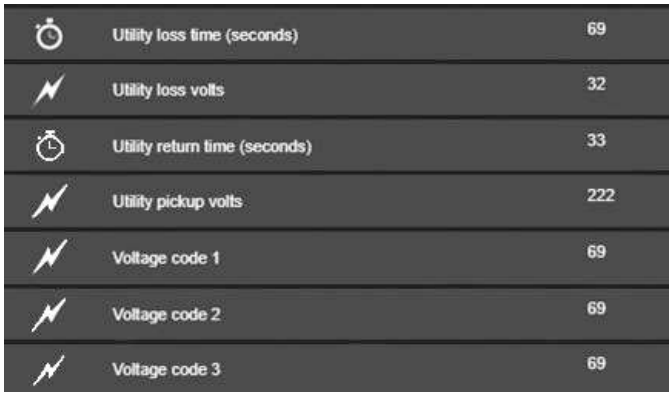


Figure 3-21. Alternator Settings

System Detail Menu

The System Detail menu provides access to the alarm logs, run logs and maintenance logs, contact information, system notes, and maintenance notes.

Alarms and Warnings

The Alarms and Warnings screen displays only active and present alarms and warnings.

A Warning (A) is considered active when the condition for the warning is present. A Warning is low severity and does not need to be acknowledged.

An Alarm (B) is considered active when an alarm condition is or was present, but the alarm has not yet been acknowledged. An Alarm is high severity and must be acknowledged. The generator will not operate when an Alarm is present.

The list of active alarms and warnings is organized into sections with controller alarms and warnings appearing at the top of the list followed by alarms and warnings for each transfer switch on the RS485 bus connected to the Gateway AUX 485 port. Each section is preceded by a row of orange text that describes the device that generated the alarm and a “Reset” button that can be used to reset the alarms on that device. If the conditions for an alarm or warning are still present, they will reappear as new.

NOTE: Resetting controller alarms can result in the generator starting if all other start conditions are active.

Alarms and Warnings are displayed with their respective icons to the left followed by the word “Alarm” or “Warning” followed by text describing the alarm.

The System Detail menu provides access to the Alarm logs, 410 controller Run logs and Maintenance logs, TX alarm and event logs, contact information, and system notes and maintenance notes.

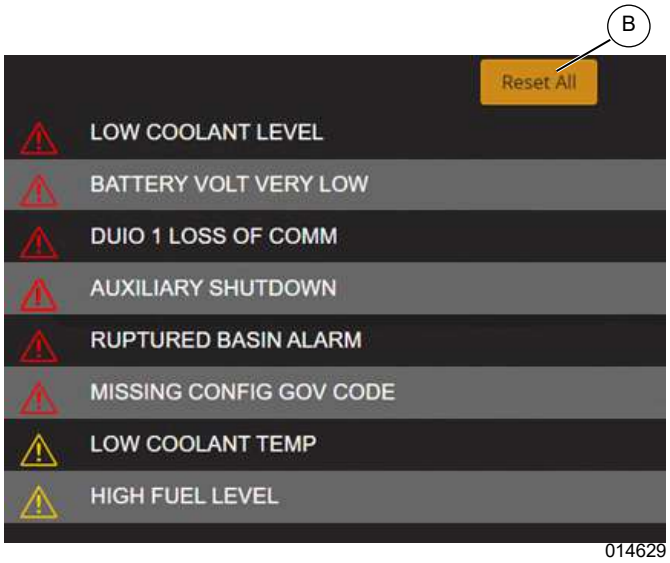


Figure 3-22. Reset Alarms, Warnings, and Maintenance

Alarm, Warning, Run, and Maintenance Logs

See ***Figure 3-23***. The Alarm, Run, and Maintenance Log screens show a chronological list of alarm, run and maintenance logs. See ***PZ 410 Controller Technical Manual*** for list of possible alarms and warnings. Each alarm entry is date and time stamped and shows the alarm text and e-code of the parameter at the time it occurred. The list filters to show alarms, warnings, run stop/starts, and maintenance items. The list is paginated and up to 1,000 entries for each log type can be stored.

The log exports to USB devices connected to the USB port of the Gateway or to the default download location of your browser. There is also an option to email the log to a list of recipients.

Download log to USB drive:

1. Select “Export”.
2. Select “USB”. A file named “log.csv” will be saved to the storage device attached to the USB port.

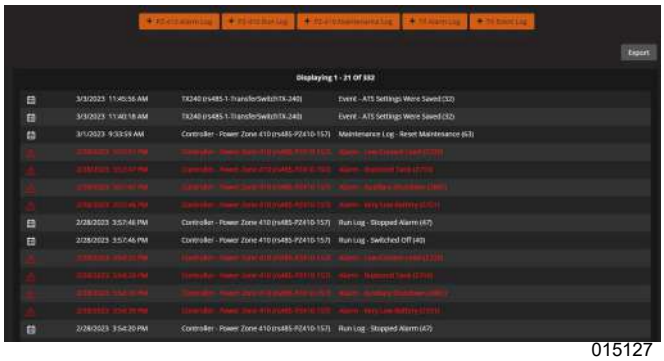
Download log to remote computer:

1. Select “Export”.
2. Select “Download”. A file will be downloaded through your browser.

Send log using email:

NOTE: This is only available if an email server has been configured in the Communications Settings.

1. Select “Export”.
2. Select “Email”.
3. Enter email addresses separated by commas.
4. Select “Send”.

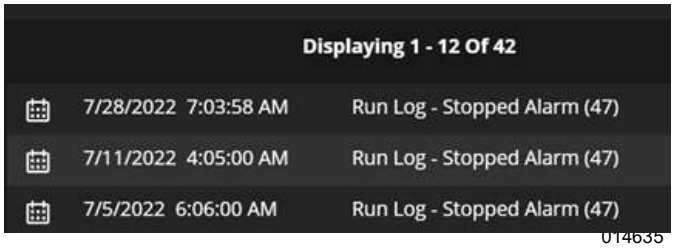


015127

Figure 3-23. Alarm History

Run Logs

See ***Figure 3-24***. The Run Logs screen shows the generator operation history.

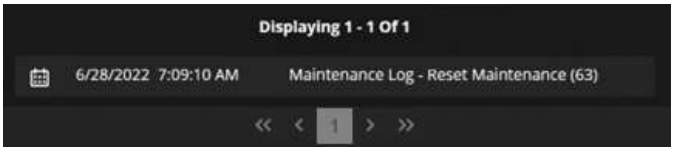


014635

Figure 3-24. Run Logs

Maintenance Schedule

See ***Figure 3-25***. The Maintenance Schedule screen displays maintenance items organized by type, date, and hours.



014636

Figure 3-25. Maintenance Schedule

Contact Information

See ***Figure 3-26***. The Dealer Information screen is an editable text field where dealer contact information is stored.

007539

Figure 3-26. Contact Information

System Notes

The System Notes screen is an editable text field where system notes and information are stored. It is available from the System Details screen. Click the “Add” button to add notes, then and click the “Submit” button to save them. The notes will appear below. The notes can be edited or deleted by clicking the “Edit” or “Delete” icons on the notes.

Setup Menu

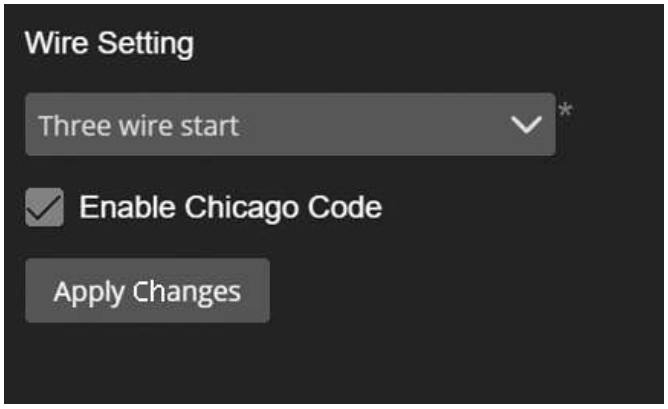
The Setup menu provides access to the submenus for user language and units selection, system setup, AMF, I/O alarm enabling, calendars, and communications.

User (Units and Language)

The User screen allows selection of units of measure and language. These items are covered in ***Units of Measure***.

System Setup

See ***Figure 3-27***. The System Setup screen is used to enter global settings about the generator.



014637

Figure 3-27. System Setup

Wiring type selection is for two wire start or three wire start.

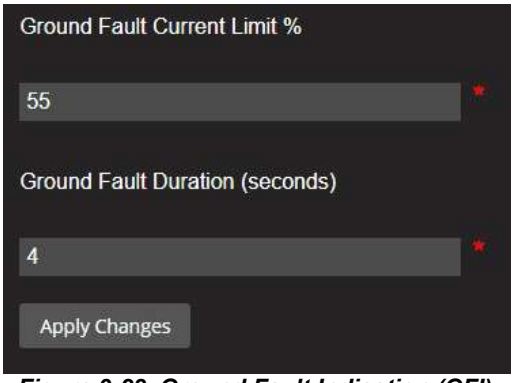
Select ‘**Enable Chicago Code**’ to satisfy Chicago Code requirements. Only for use in required jurisdiction.

Auto Mains Failure (AMF)

Auto Mains Failure (AMF) provides a way to control a non-intelligent transfer switch from the Power Zone 410 Controller. When AMF is enabled, the Controller monitors utility voltage and frequency, controls starting, and stopping of the generator.

Ground Fault Indication (GFI)

The GFI feature is used to indicate when there is a higher than desired combination of ground current and neutral current.



015126

Figure 3-28. Ground Fault Indication (GFI)

Calendars

See ***Figure 3-29***. The Calendars screen displays date and time related functions.

014620

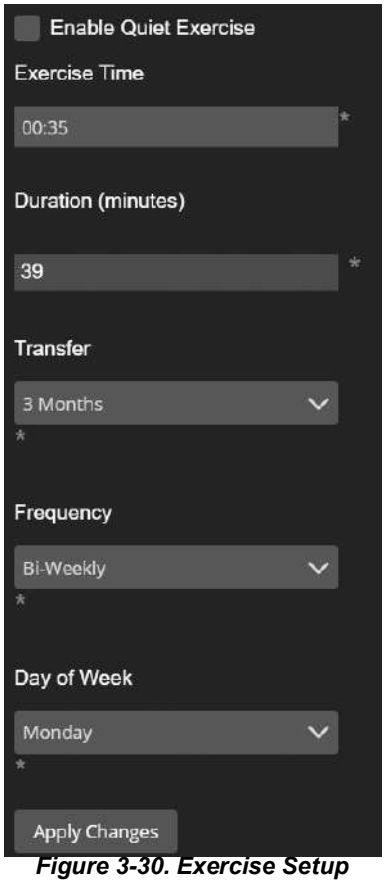
Figure 3-29. Calendars

Set Date/Time

This is covered in ***Date/Time***.

Exercise Setup

See ***Figure 3-30***. This screen is used to setup Single generator exercise. Select how often the exercise should run (weekly or biweekly) and which day of the week. Multiple days can be selected. Select the start week of Bi-Weekly (this week or next week). Set Time of the Day and Duration in 24 hour format.



014619

Figure 3-30. Exercise Setup

Communications

The Communications screens are used to configure the settings for the ethernet port used for connecting to an external ethernet network, view the modules connected on the internal Modbus RTU network through the Device Manager, configure remote modbus access to the Gateway, configure SNMP, view and configure the Gateway Internal serial (RS-485, RS-232) interfaces, configure IP Whitelisting, and configure Email server and configure distribution list for receiving alarm logs.

Ethernet Port Setup

Static IP Address Configuration for Ethernet

1. See ***Figure 3-31***. Navigate to ***(E) Setup*** (on the bottom banner) → Communications → Ethernet Gateway.
2. In the “Connection mode” setting, select “Static” (A).
3. This mode is selected to assign an IP address (IPv4) to the Ethernet interface (B).
4. IPV4 Address, Subnet, DNS, and Gateway (C) are set to match the requirements of the host network.
5. Click “Apply Changes” (D).

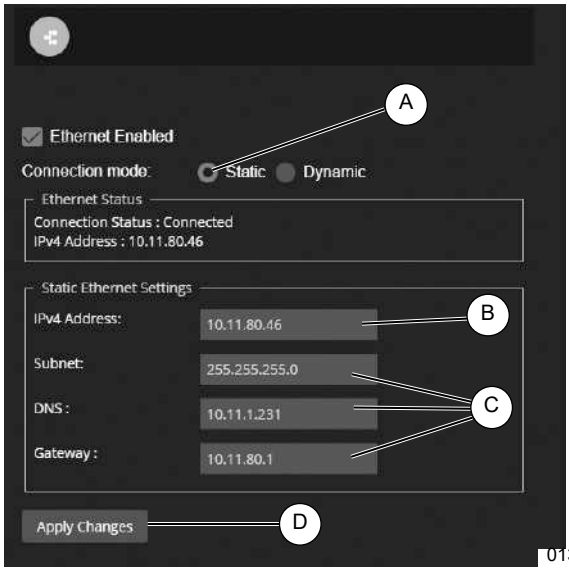


Figure 3-31. Static IP Address Configuration for Ethernet

Dynamic IP Address Configuration for Ethernet

1. See ***Figure 3-32***. Navigate to: Setup → Communications → Ethernet
2. Click Ethernet interface (A).
3. In the “Connection mode” setting, select “Dynamic” (B). This mode is selected to obtain an IP address via DHCP.
4. Click “Apply Changes” (C).
5. Once an IP address has been assigned, the IPV4 address and MAC address of the interface is displayed.

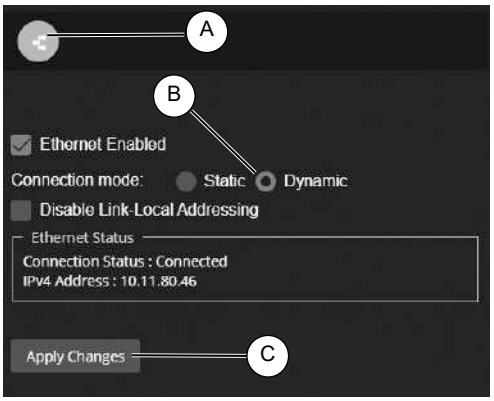


Figure 3-32. Dynamic IP Address Configuration for Ethernet

External Interfaces

Figure 3-33. Status of External Interfaces

Select ‘Communications’ -> ‘External Interfaces’ view a consolidated status of the service status for each of the external interfaces, as shown in ***Figure 3-33*** ‘Status of External Interfaces’. Clicking on ‘Configure’ for the corresponding interface will present a window for adjusting the settings. The table below shows the services that can be configured for each of the interfaces:

Port	Services
Ethernet Built In	Modbus Gateway, SNMP
RS485 Built In	Disabled, Modbus Master, Modbus Gateway
RS232 Built In	Disabled, Modbus Master, Modbus Gateway

Configuring Modbus Gateway (Pass Through)

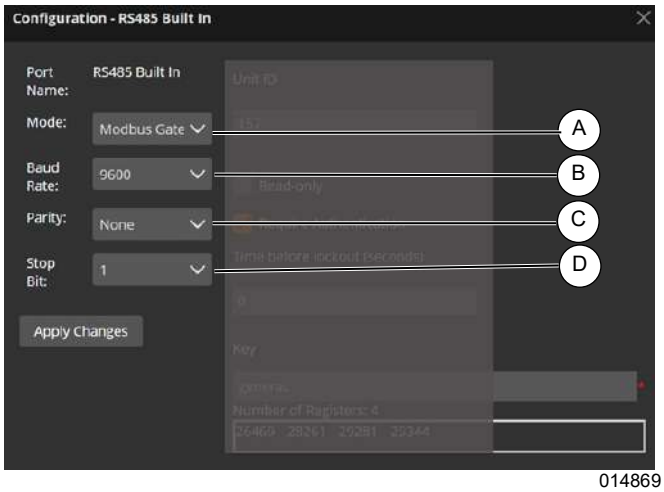
The Power Zone Gateway acts as a gateway for external systems to exchange data with a Power Zone System using Modbus. The Gateway supports both Modbus TCP and Modbus RTU over RS-485 or RS-232.

To enable Modbus TCP access, the Ethernet Built In interface is configured.

1. Press under 'Ethernet Built In' Configure button -> Modbus Gateway Configure button.
2. Selected the 'Enable' check box (F).
3. At a minimum, configure settings Unit ID (A), Ignore Unit ID (G), and Read-only (B).
4. See Secure Modbus Gateway for description for configuring secure access.

To enable RS-485 / RS-232 Modbus RTU access, the RS-485 / RS-232 Built In interface is configured.

1. Adjust port settings.
2. Select 'Modbus Gateway' from the Mode's drop down list.



014869

Figure 3-34. RS-485 Serial Port Settings

Setting	Description
A	Mode of operation
B	Baud rate
C	Parity
D	Stop Bit

For the interface being configured, set the port to match your external system's communication setting. Set the Unit ID of the Gateway (A), and set the communication settings Baud Rate (C), Parity (D), and Stop Bits (E).

Configuring Modbus Master

See ***Figure 3-35***. The Power Zone Gateway can connect to external systems over RS-485 and RS-232 as a Modbus Master. This mode of operation is required for SNMP service for the target device, Transfer Switch. Screen for Modbus Master configuration is identical for the interfaces, shown below is settings on RS-485 interface.

NOTE: SNMP service is configured with the Ethernet Built In interface. See ***SNMP (Simple Network Management Protocol)***.

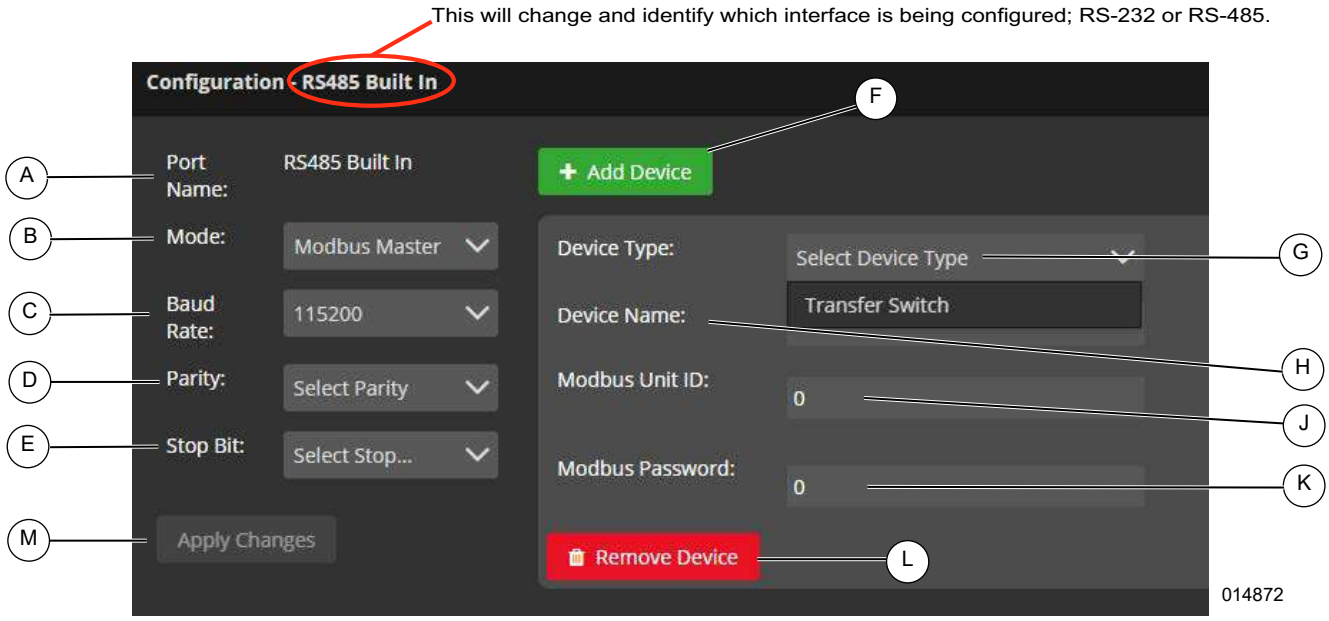


Figure 3-35. Serial Port Interface - Modbus Master

Letter	Setting Name
A	Port Name - port currently being configured
B	Mode - Modbus Master currently selected
C	Baud Rate - serial port setting (300bps - 115kbps)
D	Parity - serial port setting (none, even, odd, mark, space)
E	Stop Bit - serial port setting (1,2)
F	Add Device - press to add device to communicate with. Up to 30 devices can be added.
G	Device Type - (Transfer Switch)
H	Device Name - assign friendly name to device
J	Modbus Unit ID - id of device added (1-125)
K	Modbus Password - password required to communicate with device added
L	Remove Device - press to remove device
M	Apply Changes- press to have changes take effect, including when removing device

SNMP (Simple Network Management Protocol)

See ***Figure 3-37*** and ***Figure 3-40***. Navigate to SNMP by clicking Setup (A), the Communications dropdown (B), External Interfaces (C), pressing on Configure in Ethernet Built In section, pressing on Configure in the SNMP Section. The protocol SNMP is used by NOC (Network Operations Center) or data center to monitor Power Zone system.

NOTE: The screens differ depending on whether SNMPv2c or SNMPv3 is selected. See ***Figure 3-37*** and ***Figure 3-38*** for setup. See ***Figure 3-39*** for SNMPv2C and ***Figure 3-41*** for SNMPv3 configuration.

1. Enable SNMP (D).
2. Set SNMP version to SNMPv2c (E).
3. Check the “Enable Authentication” checkbox (F).
4. Tap “Add Community” button (G).
5. Enter Community Name (J) and set access level (K).
6. To delete an entry use the trash button on the right side of the screen (H).
7. If multiple communities are being used, go to step 4 and repeat until all communities are entered.
8. Tap “Apply Changes” button (L) to save all settings.

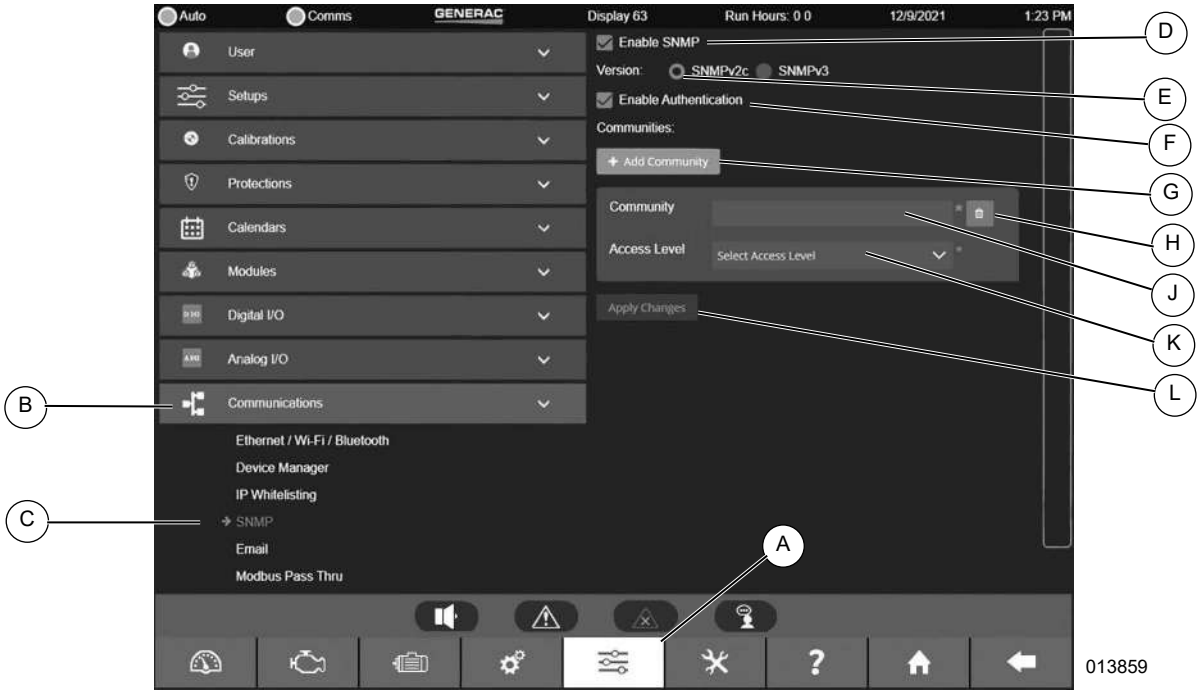
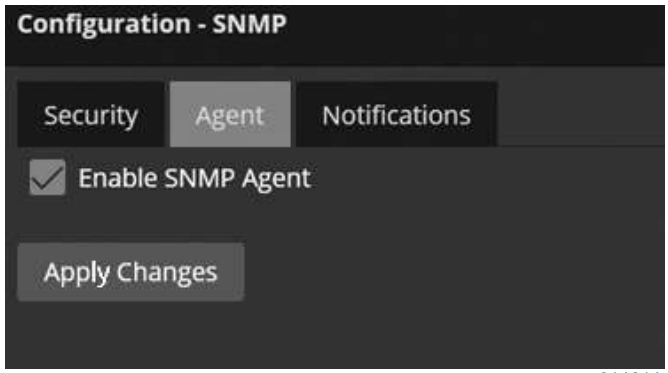


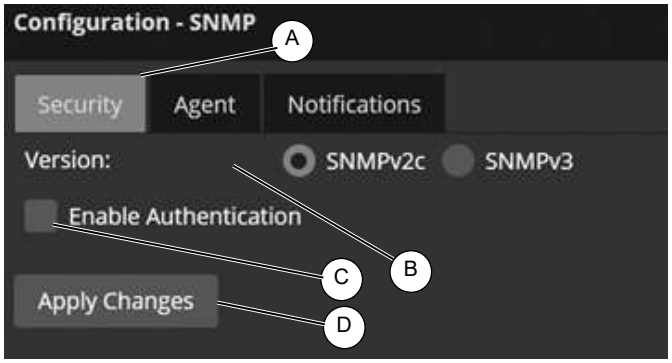
Figure 3-36. SNMPv2c

Letter	Setting Name
A	Setup
B	Communications Dropdown.
C	Select SNMP.
D	Enable SNMP.
E	Select SNMP version SNMPv2c.
F	Enable Authentication.
G	Add Community. Multiple Communities can be specified, each with their own name and access level.
H	Delete entry.
J	Community name.
K	Access Level (None, Read Only, Read Write).
L	Save settings.



014614

Figure 3-37. Enable SNMP Agent

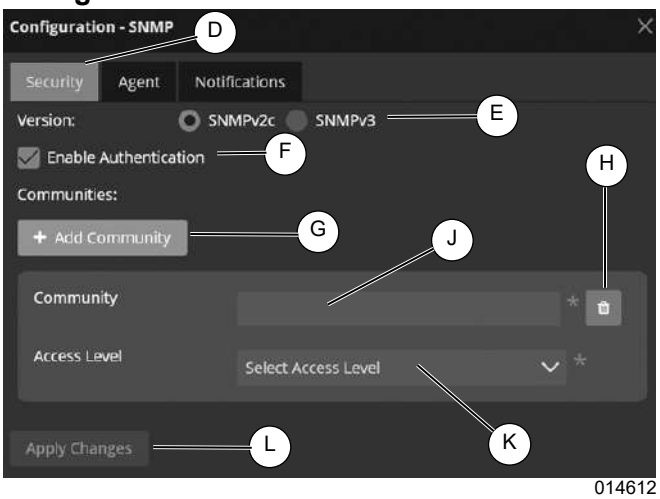


014613

Figure 3-38. Select SNMP Version

Letter	Setting Name
A	Function settings.
B	Select SNMP Version.
C	Select to use authentication; further settings available after making selection.
D	Save Changes.

Configure SNMPv2c



014612

Figure 3-39. SNMPv2c

Letter	Setting Name
D	Shows Security Settings Tab.
E	Select SNMP version SNMPv2c.
F	Enable Authentication.
G	Add Community. Multiple Communities can be specified, each with their own name and access level.
H	Delete entry.
J	Community name.
K	Access Level (None, Read Only, Read Write).
L	Save settings.

Configure SNMPv3

1. Enable SNMP (D).
2. Set SNMP version to SNMPv3 (E).
3. Tap “Add User” button (F).
4. For each user, enter user name (H), select user access level from the dropdown list (J), select authentication level (K) from the dropdown list, and select the encryption setting from the dropdown list.
5. To delete a user, use the trash button (G) on the right side of the screen to delete a user.
6. Tap “Apply Changes” button to save all settings.

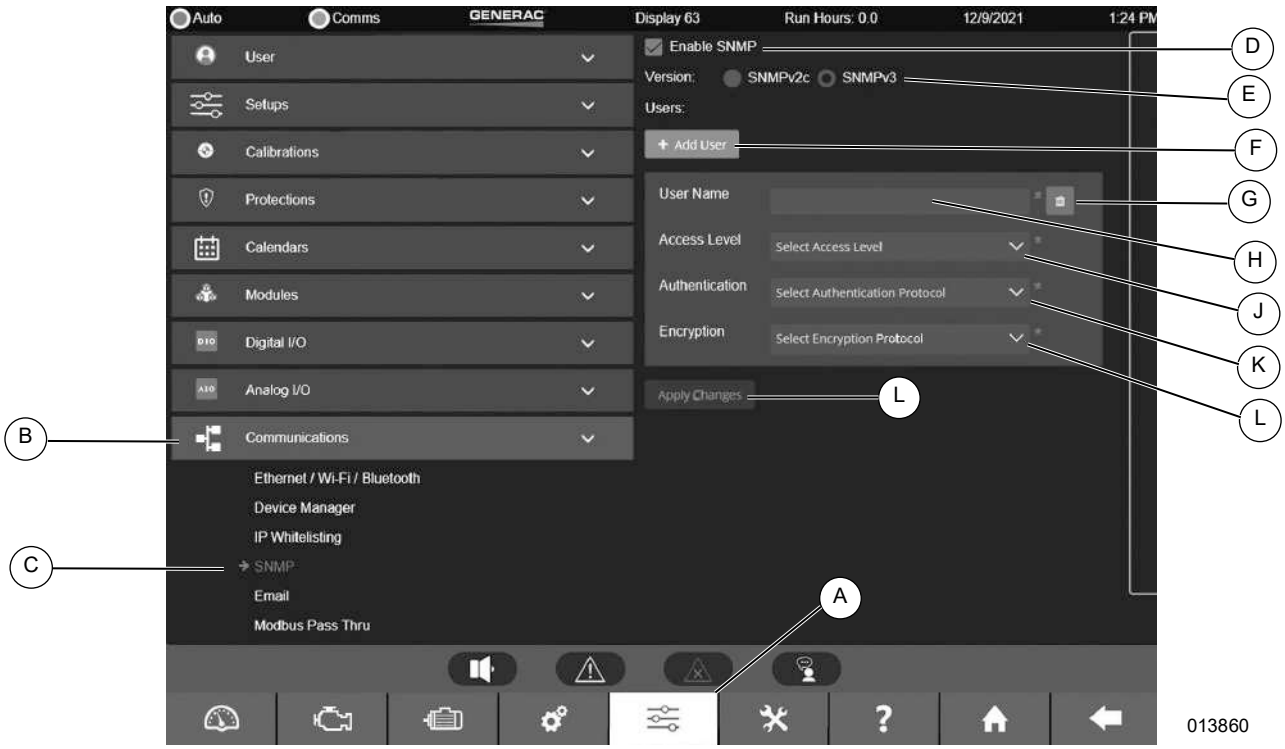


Figure 3-40. SNMPv3

Letter	Setting Name
A	Setup
B	Communications Dropdown.
C	Select SNMP.
D	Enable SNMP.
E	Select SNMP version SNMPv3.
F	Add user.
G	Delete entry.
H	User name. Requests will be rejected if message does not include matching user name.
J	Access Level (None, Read Only, Read Write).
K	Authentication Level setting (No authentication, MD5, SHA).
L	Encryption setting (No Encryption, 128-bit AES, 256-bit AES-Blumenthal, 256-bit AES-Reeder).
M	Save settings.

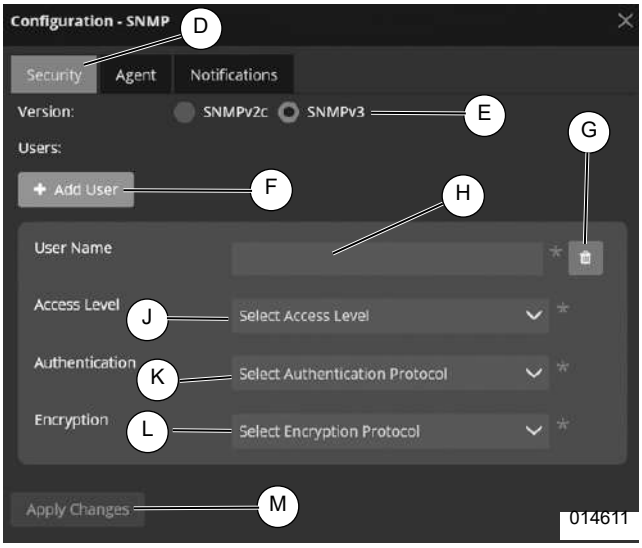


Figure 3-41. SNMPv3

Letter	Setting Name
D	Enable SNMP.
E	Select SNMP version SNMPv3.
F	Add user.
G	Delete entry.
H	User name. Requests will be rejected if message does not include matching user name.
J	Access Level (None, Read Only, Read Write).
K	Authentication Level setting (No authentication, MD5, SHA).
L	Encryption setting (No Encryption, 128-bit AES, 256-bit AES-Blumenthal, 256-bit AES-Reeder)
M	Save settings.

SNMP Notifications

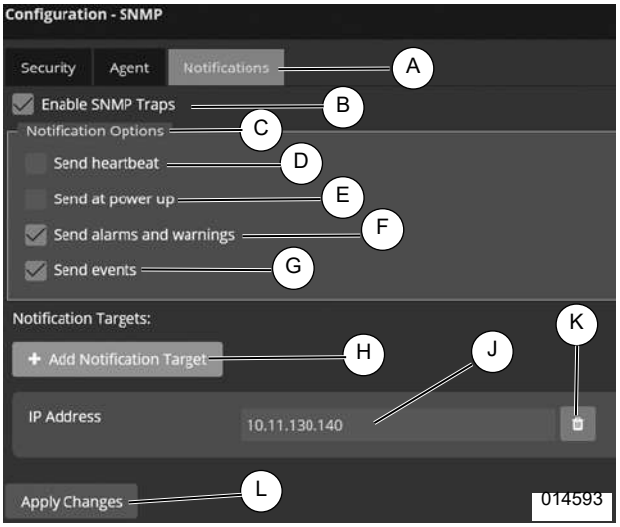


Figure 3-42. SNMP Notifications

Letter	Setting Name
A	Notifications tab selected.
B	Enable SNMP Traps to be sent.
C	Notification Options.
D	Select to send out periodic message.
E	Select to send message at Gateway startup.
F	Select to send Power Zone Alarms and Warnings in SNMP messages.
G	Select to send Power Zone events in SNMP message.
H	Add SNMP manager address.
J	IP address of SNMP manager.
K	Delete notification target entry.
L	Apply changes.

1. See ***Figure 3-42***. Select the “Notifications” tab.
2. Tap the checkbox to enable SNMP traps to be set.
3. Select “Send Heartbeat” (D) checkbox to send out periodic notifications.
4. Select “Send at Power Up” (E) checkbox to send notifications at startup.
5. Select “Send Alarms and Warnings” (F) checkbox to send SNMP alarm and warning messages.
6. Select “Send Events” (G) checkbox to send Power Zone Events.
7. To add notification targets, tap the “Add Notification Target” tab and enter the corect IP address.
8. To delete a particular notification target, tap the trash button (K) on the right side of the screen.
9. Tap the “Apply Changes” button (L) to save all settings.

IP Whitelisting

See ***Figure 3-43***. Navigate to IP Whitelisting by clicking Setup (A), the Communications dropdown (B), and IP Whitelisting (C). IP Whitelisting is useful when remote access from devices with specific IP addresses is allowed. The IP addresses can be specified by either format, individual IP address or range of IP addresses using CIDR notation.

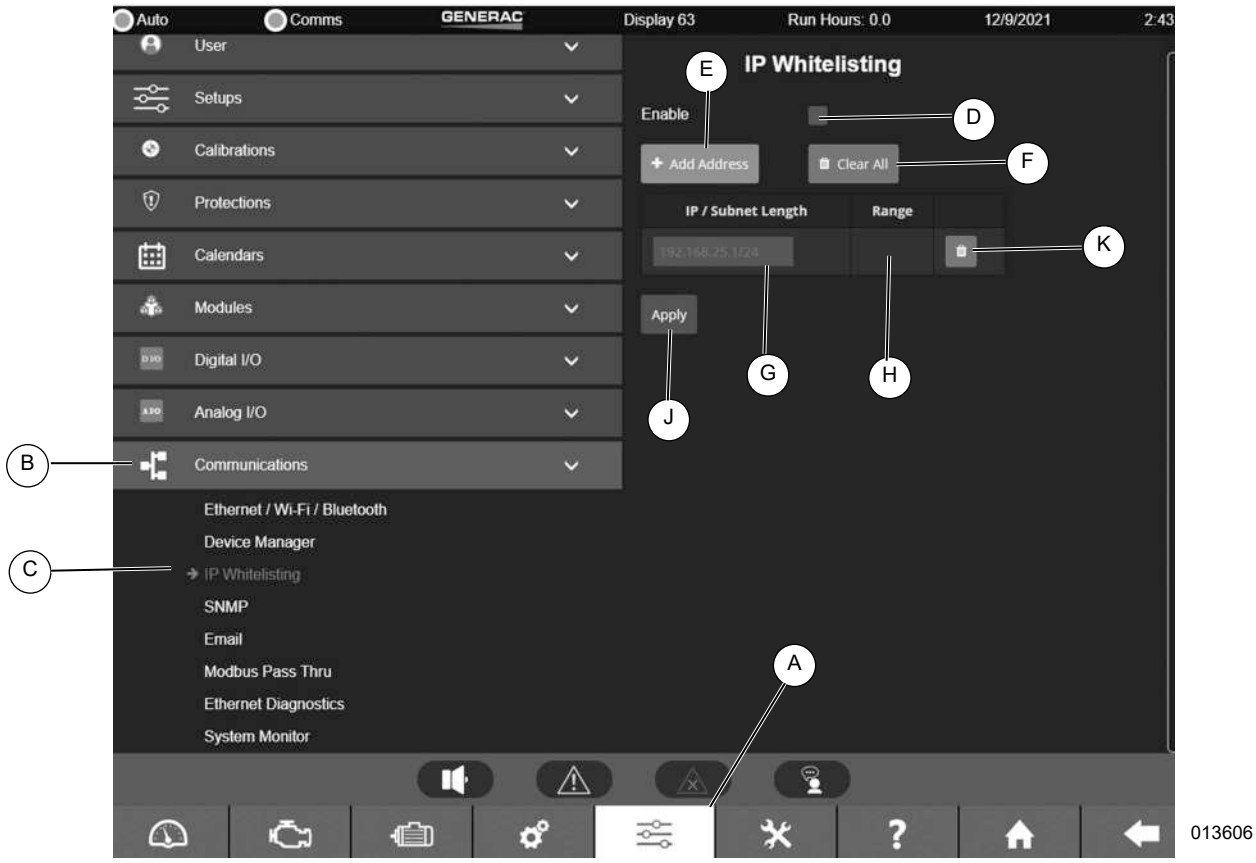


Figure 3-43. IP Whitelisting

Letter	Setting Name
D	Enables IP whitelisting. Default setting is Disabled. **NOTE:** Settings added prior to disabling will be preserved.
E	Adds a text box to enter IP address. Multiple IP addresses can be specified.
F	Deletes the list of IP addresses.
G	Example specifying either a single IP address or a range of IP addresses using CIDR (Classless Inter-Domain Routing) notation.
H	CIDR notation of IP address is automatically expanded and shown here (if applicable).
J	Save settings.
K	Delete individual entry.

Email

Power Zone features that use email must have access to a Simple Mail Transfer Protocol (SMTP) email server. See ***Figure 3-44***. This screen allows you to set up the email server and recipient list for alarm, event, and warning emails. The name or IP address of the server providing SMTP services is entered in the Host field (A). The name to be used as the sender of the email is entered in the From field (B). You can use different names for each generator to help you identify the source of an email. Enter the port number being used by the SMTP service in the Port field (C). Most SMTP servers use port 25.

Select the desired Transport Layer Security (TLS) settings (D). Options are:

- **Automatic TLS Settings:** The connection to the mail server is started in plain text and TLS is used if the mail server supports the STARTTLS extension.
- **Always Use TLS:** The connection to the mail server is started in plain text and sends STARTTLS commands even if the mail server does not advertise support for it. If the server cannot support TLS, no email will be sent.
- **Use SMTP over TLS:** TLS will be used when connecting to the mail server.
- **Never Use TLS:** TLS will not be used to connect to the mail server or as a STARTTLS connection upgrade command.

If your SMTP server requires a user ID and password to send emails, check the Use Authentication box (E), and enter the required user ID and password in the Username and Password fields (F).

The Alarm distribution list is used to enter a list of email addresses that should receive an email notifying them of any alarms, warnings, or events that occur. To remove an address from the list, press the red garbage can icon (G) to the right of the email address. The Alarms and Warnings check box (H) should be checked if that address should receive emails of all alarms and warnings. The Events check box (I) should be checked if that address should receive emails of all events. If you would like the emails to contain an attached data log file of data logged for a period of time preceding and following the alarm, warning, or event, check the Attachments check box (J). Click the Add button (K) to save your changes.

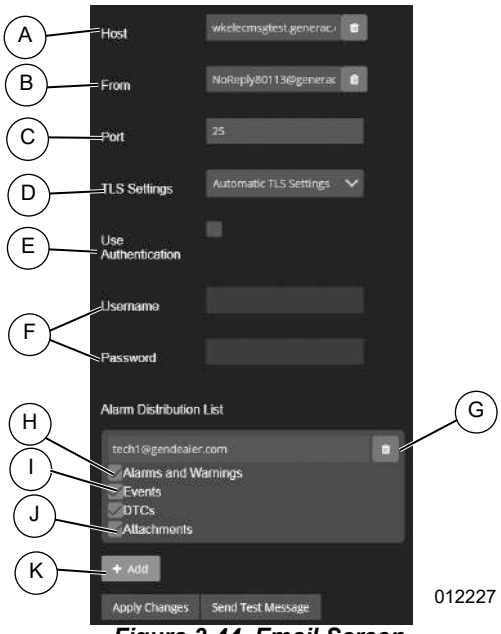


Figure 3-44. Email Screen

Configuring Modbus Pass Through

See ***Figure 3-45***. The Power Zone Gateway acts as a gateway for external systems to exchange data with a Power Zone System using Modbus. The Gateway supports both Modbus TCP and Modbus RTU over RS-485.
To enable Modbus TCP access, check the box labeled Modbus TCP.
To enable Modbus RTU access, check the Modbus RTU checkbox and configure the RS-485 port to match your external system's communication settings. To configure the RS-485 port, set the Unit ID of the Gateway (A), select the RS-485 port from the Serial Port name (B) and set the communication settings Baud Rate (C), Parity (D), and Stop Bits (E).

Figure 3-45. Modbus Pass Through Screen

Tools Menu

See ***Figure 3-46***. The Tools menu displays submenus for login, configuration file transfer, synchroscope, J1939 CAN bus diagnostics, diagnostics, trending, PLC manager, and update firmware.

014873

Figure 3-46. Tools Menu

Login Menu

See ***Figure 3-47***. The Login menu provides access to secured functionality through a user's security credentials.

To login:

1. Enter credentials into the input control labeled "Enter Credentials", or click the keyboard icon and enter credentials.
2. Select "Log in".
3. The system will validate the credentials and, if successful, will allow access to the appropriate level of secured functionality. If the credentials were not valid a failure message will be shown.

009625

Figure 3-47. Login Menu

Configuration File Transfer Screen

Power Zone generator configuration settings can be saved as key-value pairs in a text file or read from a previously saved configuration file and applied to a generator via the Configuration File Transfer menu, which can be found by selecting the Tools Menu icon. Configuration File Transfer has two options. The "Read from Controller" option (***Figure 3-48***) reads the current settings from a Power Zone Main Controller and writes them to an text configuration file which can be saved to a mobile device through a browser or saved to a USB drive connected to the Gateway:

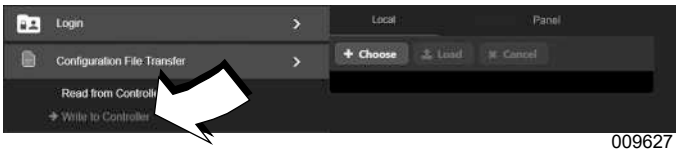
1. Navigate to Tools → Configuration File Transfer → Read From Controller.
2. Select "Get Configuration" to create an text configuration file.
3. Select the "Local" tab to download to a mobile device through a browser. Select "Download".
4. Select the "Panel" Tab to save to a USB drive. Select "Save to USB Drive".

009626

Figure 3-48. Read from Controller

The "Write to Controller" option (***Figure 3-49***) takes an existing text configuration file and applies those settings to the Main Controller:

1. Navigate to Tools → Configuration File Transfer → Write to Controller.
2. To use a file stored on your network connected device, select the "Local" tab and select "Choose". Select the file and select "Load".
3. To use a file stored on a USB device connected to the Gateway, select the "Panel" tab and select "List Configuration Files". Select the file and select "Load".



009627

Figure 3-49. Write to Controller

Load the Power Zone Software Package

1. See ***Figure 3-50***. Select "USB on Display" tab (A).
2. Select "Choose" (B).
3. Select a package and select "Load" on the file uploader.

To upload a package remotely:

1. Select the "Local File" tab (C).
2. Select "Choose" (B) to display search navigation.

3. Select a package.
4. Select “Load”.

The “Load” button uploads the chosen package to the Gateway. After the upload is successful, the Gateway will display a summary of the updates to be made.

Press the “Continue” button (D) after reviewing the versions of the firmware files from the bundle. The System Update screen will display the firmware updates to be made.

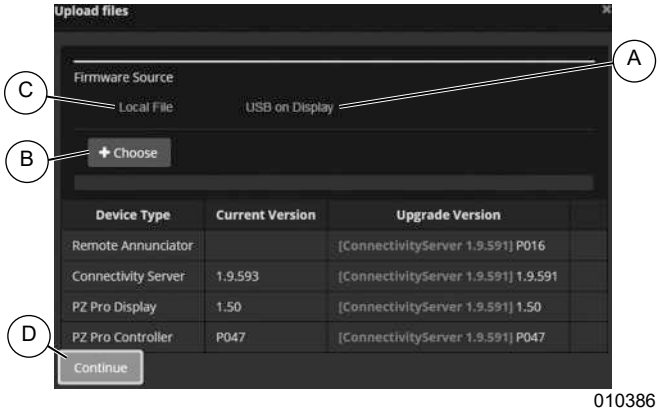


Figure 3-50. Load Software Package

See ***Figure 3-51***. Press the “Start” button (E) to begin the upgrade process. The start button will change to an “Abort” button (E) which can be used to terminate the update process. Aborting an update while in progress can leave some Power Zone modules in a boot loader mode. To recover, run the System Update process to completion. During a system update, the Status column (F) will display the status of each step of the update process. If the Gateway is updated, it will automatically reboot. During reboot the Gateway will lose connection with other devices, including the PC. The web browser screen showing the application will time out. After reboot is complete, the PC web browser will re-establish connection with the Gateway app.

Figure 3-51. Upgrade Progress

HTTPS Configuration Screen

See ***Figure 3-52***. The Gateway comes from the factory with self-signed SSL/TLS security certificates. The default certificates can be replaced with domain specific certificates via the HTTPS Configuration Screen.

To upload certificates from a remote computer:

1. Select the “Local” tab (A) in file uploader.
2. Select “Choose” (B) to open search navigation.
3. After a file is chosen, select “Load” (C) to upload file.

To upload files from USB:

1. Select the “Panel” tab (D).
2. Select “List Files” to display files found on USB drive.
3. Select “Load” (C) to upload file.

HTTP access can be enabled and disabled via port 80. HTTPS on port 443 is always enabled. If HTTP is disabled, all attempts to access the Gateway via HTTP port 80 will be routed automatically to HTTPS port 443. If the “Use user supplied certificate” check box (E) is not checked, the factory default certificates are used. Once the certificate files are uploaded, select “Apply Changes” (F) for the certificates to be used.

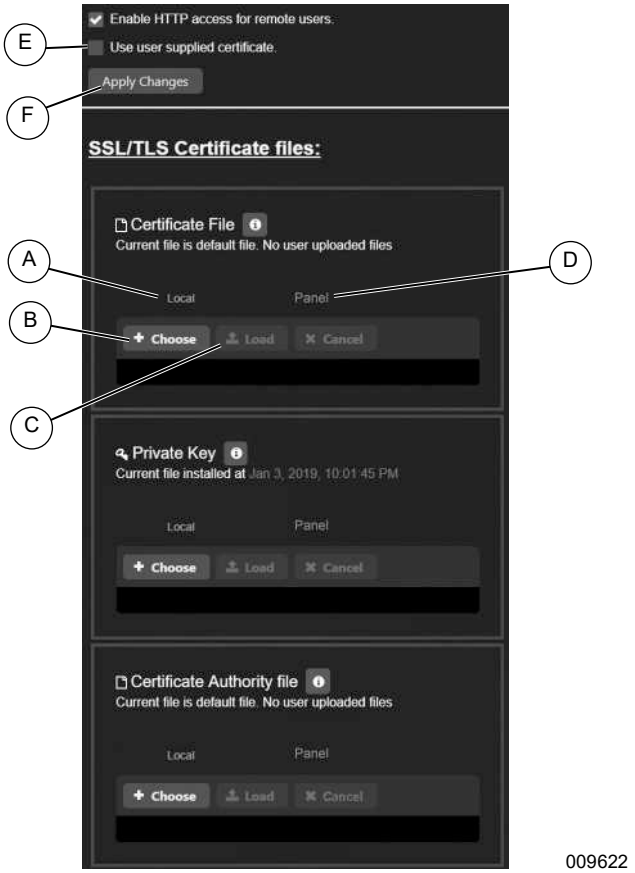


Figure 3-52. HTTPS Setup

Help

The Help menu provides access to the user manuals and documents, the About screen, and the Upload Documents screen.

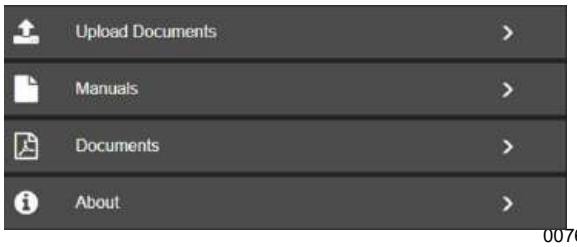


Figure 3-53. Help

About Screen

This screen displays information about the Power Zone system such as hardware and firmware versions, external storage, and the current status of communication ports.

Press the 'Factory Reset' button to restore the Gateway to its original system state.

The ability to initiate a Factory Reset or Network Reset is available on the built-in display. The Factory reset is the same as what's available on the Gateway Support Tools menu.

Upload Documents Screen

See ***Figure 3-54***. The Upload Documents screen can be used to either provide translated Power Zone Owner's Manuals or documentation like wiring diagrams for storage and use on the Gateway. Only PDF files are currently supported.

To select a file from a mobile device:

1. Select "Local File" tab (A).
2. Select "Choose" (B).
3. Select a file from your mobile device.

To select a file from a USB drive attached to the Gateway:

1. Select "USB on Panel" tab (C).
2. Select "List Packages".
3. Select a file.

To upload the file as a manual:

1. Select the file and choose the "Manuals" radio button (D).
2. Select from the "Manual List" dropdown (E).
3. Select the language of the manual (F).
4. Select "Upload file" (G).

To upload the file as a document:

1. Select the file and choose the "Documents" radio button (H).
2. Select from the "Documents" dropdown, or type a new document name for the uploaded file.
3. Select the language of the document (F).
4. Select "Upload file" (G).

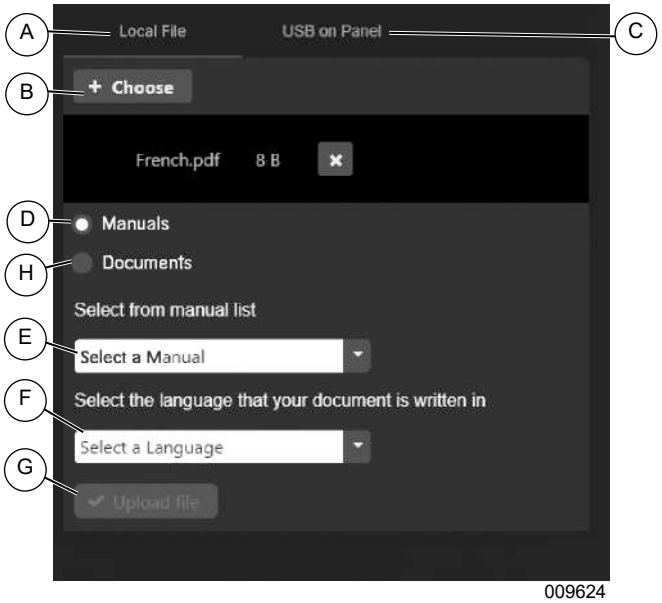


Figure 3-54. Upload Documents Screen

Login and Security

See ***Figure 3-55***. From the "Tools" menu (A), select "Login" (B). This screen provides a keyboard to input a password for access to restricted areas of the app.

NOTE: If not logged in, the user will be prompted to enter a password if trying to access a restricted area of the app, as shown in ***Figure 3-56***.

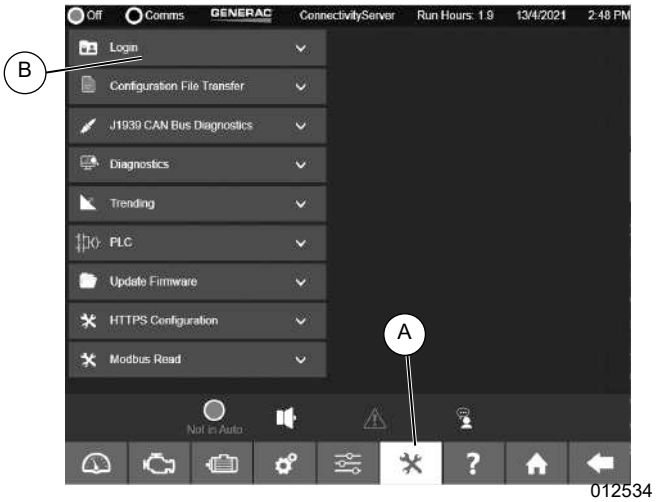


Figure 3-55. Login Menu

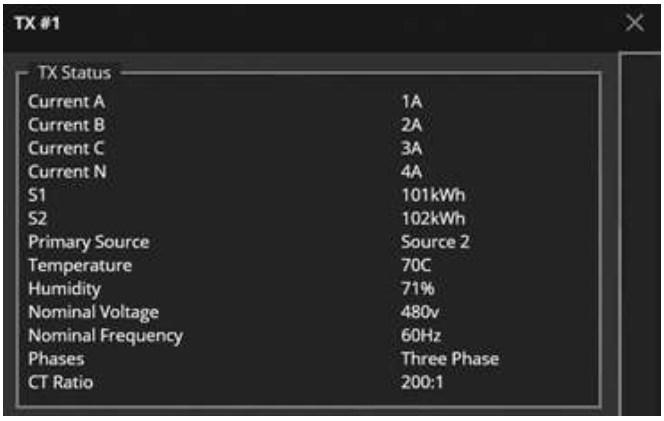
Figure 3-56. On-screen Keyboard

Transfer Switch Dashboard

015056

Figure 3-57. Transfer Switch Dashboard

See ***Figure 3-57***. The Transfer Switch Dashboard Screen shows the current settings and readings retrieved from the Transfer Switch Controller. ***Figure 3-57*** shows three transfer switches connected and details for each one. For each transfer switch shown, by clicking in a transfer switches region in the screen, it's status is shown along with Exercise and Heater settings that can be adjusted. See ***Figure 3-58***, ***Figure 3-59***, and ***Figure 3-60***.



015057

Figure 3-58. Transfer Switch Status

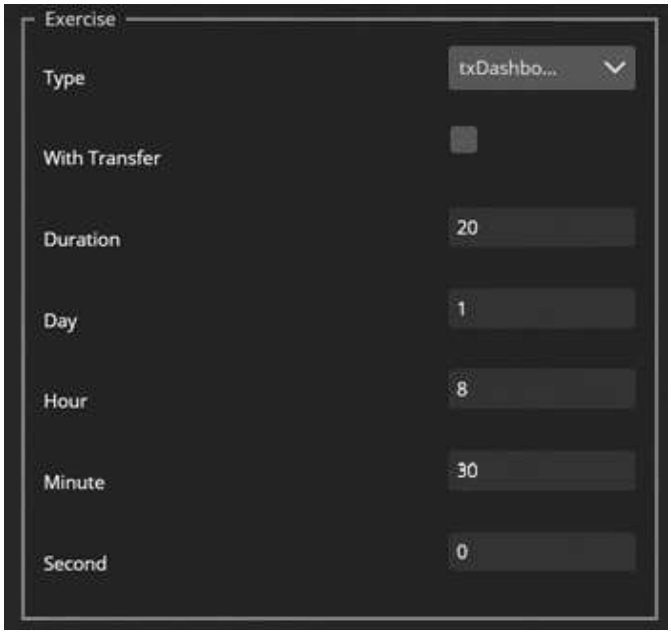


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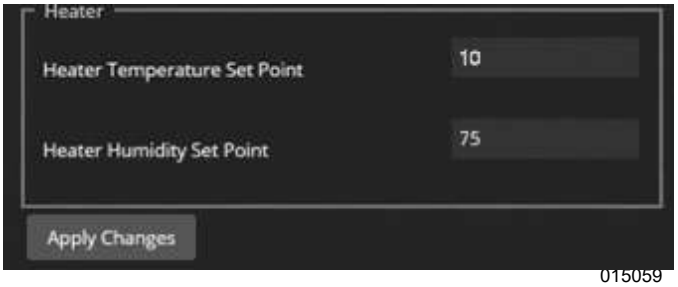
Figure 3-59. Transfer Switch Exercise



015059

Figure 3-60. Transfer Switch Heat and Humidity Settings

Section 4: Troubleshooting

Troubleshooting Guide

Problem	Solution
Red LED in front of enclosure is OFF	Verify 12 V⎓ power and ground wires are connected properly on PWR_RS485 connector to the Power Zone Pro Main Controller BS6 connector.
Green LED in front of enclosure is OFF	Verify the RS-485 wires are connected properly on PWR_RS485 connector to the Power Zone 410 Controller.
Green LED in front of enclosure is not blinking	Operating system or application is not working properly. Unplug and plug back the PWR_RS485 cable to the Gateway.

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Generac Power Systems, Inc.
S45 W29290 Hwy. 59
Waukesha, WI 53189
1-888-GENERAC (1-888-436-3722)
www.generac.com