

Owner's Manual
Power Zone[®] Connectivity Server



SAVE THIS MANUAL FOR FUTURE REFERENCE

 **WARNING**

CANCER AND REPRODUCTIVE HARM

www.P65Warnings.ca.gov

(000393a)

Table of Contents

Section 1: Introduction and Safety

Introduction	1
Read This Manual Thoroughly	1
Safety Rules	1
General Hazards	2
Electrical Hazards	2

Section 2: General Information

Equipment Description	3
Symbol Definition	3
Standard Features	3
Codes and Standards	3
Specifications	4
Connection Locations	5
Dimensions	6

Section 3: Installation and Operation

Installation	7
Using the Extension Kit to Mount Outside Generator Enclosure	7
Cleaning	7
Connection Details	8
Light Emitting Diodes (LEDs)	8
Connecting to the Connectivity Server	8
Wi-Fi Connection	8
Bluetooth Connection	9
Ethernet Connection	9
Home Screen	9
Screen Layout	10
Top Banner	10
Bottom Banner	11
Home Screen Bargraphs	12
Alarm Ribbon	12
Screen Features	12
Scrolling	12
Language	12
Units of Measure	13
Date/Time	13
Health Checkmark	13
Editing	14

Screen Icon Details	15
Home Screen	15
System Dashboard Screen	15
Engine Detail Screen	15
Alternator Detail Screen	16
System Detail Menu	16
Setup Menu	19
Calendars	25
Set Date/Time	25
Modules	26
Remote Annunciator Setup	26
Digital I/O	27
Digital Input (DI) Setup	27
Digital Output Function (DOF) Setup	27
Digital Output Channels (DO) Setup	27
Analog I/O	28
Analog Input (AIN) Setup	28
Analog Output (AO) Setup	29
Communications	30
Wi-Fi and Ethernet Port Setup	30
Bluetooth Setup	32
Turn Bluetooth OFF or ON	32
Device Manager Setup	34
Email	34
Configuring Modbus Pass-through	35
Tools Menu	35
Login Menu	35
Help	42
About Screen	42
Upload Documents Screen	42
Login and Security	43

Section 4: Troubleshooting

Troubleshooting Guide	45
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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



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.

IMPORTANT NOTE: Use this manual in conjunction with the appropriate generator owner's manual.

NOTE: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates,

uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

NOTE: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

NOTE: This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license exempt RSS(s). Operation is subject to the following two conditions:

- This device may not cause interference.
- This device must accept any interference, including interference that may cause undesired operation of the device.

NOTE: This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

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 Connectivity Server (Assembly No. 10000039844) is a user interface for the Power Zone system. The Connectivity Server can be used in applications other than generator control.

- Communications Ports
 - Ethernet – 1 Port
 - RS-485 – 1 Port for Generator Main Controller
 - USB – 1 Type A (Host)

Symbol Definition

	AC Generator
	AC Voltage
	DC Voltage

Codes and Standards

- UL 2200
- UL6200
- CSA STD C22.2 No. 14
- C-ETL-US
- IEC 61010-1
- FCC
- NFPA 110 (Software Programmable Level for 1 or 2)

Standard Features

- Wi-Fi®/Bluetooth™
- 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
 - Selectable Line to Line or Line to Neutral Voltage Measurements
 - Voltage Frequency
 - Engine Speed
 - Engine Coolant Temperature
 - Engine Oil Pressure
 - Engine Oil Temperature
 - Battery Voltage
 - Warning and Alarm Indication
 - Diagnostics
 - Maintenance Events/Information
 - Engine Hourmeter

Specifications

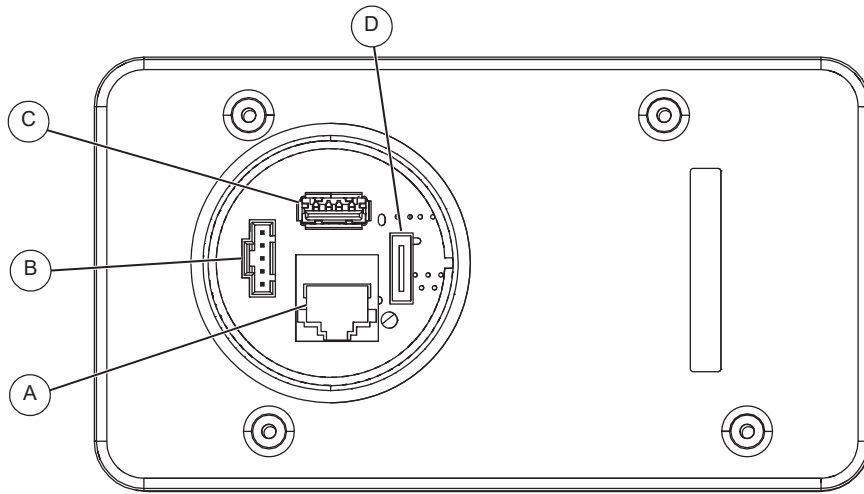
Environmental Specifications	
Operating Temperature	-4 °F (-20 °C) to 140 °F (60 °C)
Humidity	5% to 90% non-condensing
Sealing	IP65 rated
Enclosure	UL Type 3R
Weight	0.5 lbs
Power Supply Requirements	
Power Supply Voltage	11 to 13 V _{DC} (12 V _{DC} nominal)
Power Supply Usage	1.1 A (maximum during 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	1
Communication Link	2 wires
Communication Cable	2 wires - shielded twisted pair (i.e. Belden 3105A)
Maximum Cable Length	4,000 ft (1,219 m)
Baud Rate	115.2 kbps
Maximum Number of Devices	32
Protocol/Device Type	Modbus/Master
Communication (USB)	
Number of Ports	1
Connector	Type A
USB version	USB 1.1/2.0
Maximum Cable Length	16.5 ft (5 m)
Baud Rate	12 Mbps, 480 Mbps
Communication (Wi-Fi and Bluetooth)	
Supported Antenna Type	2.4 Ghz Wi-Fi/Bluetooth
Wi-Fi	802.11 b/g/n (2.4 Ghz)
Bluetooth	4.1
Antenna (Wi-Fi and Bluetooth)	
Type	Internal on-board chip antenna
Frequency Band	2.4 Ghz
Gain	1.5 dBi max (2.4 Ghz)
Distance	20 ft (6.1 m) inside generator enclosure, 200 ft (61.0 m) outside generator enclosure*
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.

* Use Extension Kit (part no. A0000310806) to connect Power Zone Pro Main Controller to Connectivity Server when Connectivity Server is mounted outside the generator enclosure.

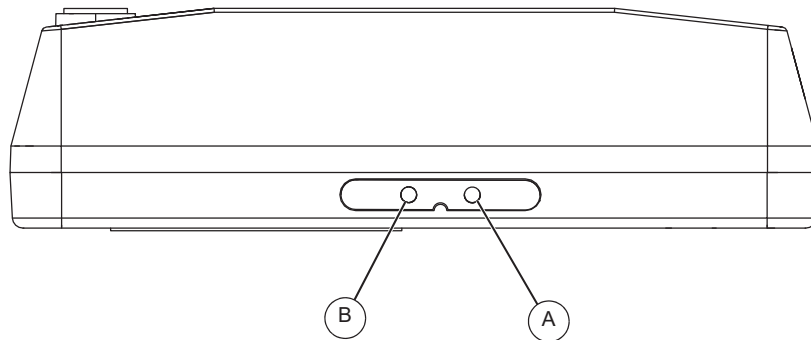
Connection Locations



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Figure 2-1. Connection Locations (Bottom View)

A	Ethernet Connection	C	USB Connection
B	Power and RS-485 Connection (PWR_RS485 Connector)	D	HDMI Connection



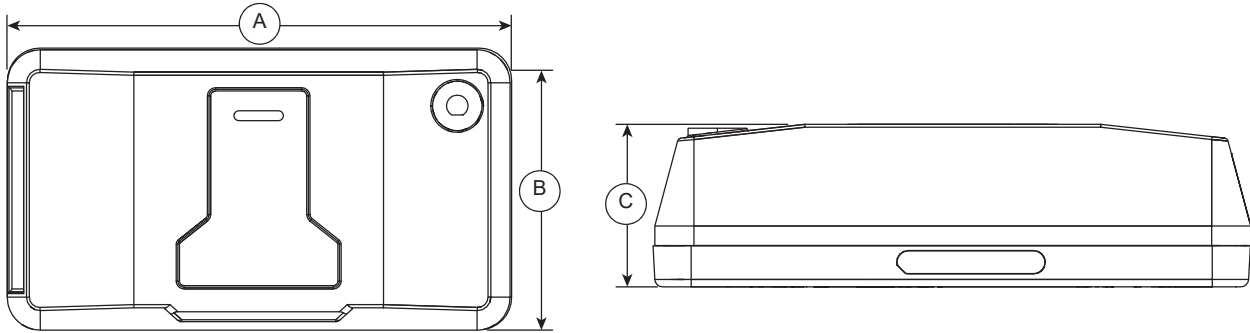
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Figure 2-2. LED Locations (Front View)

A	Power LED (Red)
B	Communication LED (Green)

NOTE: See [Connection Details](#) for more information regarding the connections and LEDs.

Dimensions



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Figure 2-3. Connectivity Server Enclosure Dimensions

A	6.02 in (152.9 mm) ± 0.01 in (0.3 mm)
B	3.37 in (85.5 mm) ± 0.01 in (0.3 mm)
C	1.65 in (42.0 mm) ± 0.01 in (0.3 mm)

Section 3 Installation and Operation

Installation

⚠ WARNING

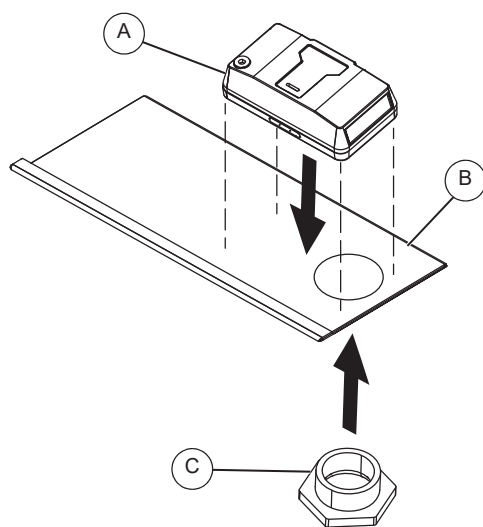
Equipment damage. Only qualified service personnel may install, operate, and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage. (000182a)

The Connectivity Server is installed using a conduit connector (part no. 10000032818). See [Figure 3-1](#).

1. Place the Connectivity Server (A) on top of the mounting enclosure (B) with LEDs facing the front.
2. Place the conduit connector (C) beneath the conduit opening and rotate clockwise until it contacts the end panel.
3. Hand tighten the conduit connector, then tighten to **16 in-lb** (1.81 Nm).

NOTE: Do not over tighten conduit connector.

NOTE: Generac does not recommend opening the enclosure. However, if opened, the enclosure screws must to be tightened to **6 in-lb** (0.68 Nm).



009517

Figure 3-1. Installation

A	Connectivity Server
B	Mounting Enclosure
C	Conduit Connector

IMPORTANT NOTE: The Connectivity Server contains an on-board chip antenna for Wi-Fi/Bluetooth signal. The signal will penetrate through the plastic enclosure, but any metal surface around the Connectivity Server will reduce its range. For maximum signal range, use an extension kit (part no. A0000310806) and mount the Connectivity Server on top of the generator enclosure. See [Using the Extension Kit to Mount Outside Generator Enclosure](#).

Using the Extension Kit to Mount Outside Generator Enclosure

The Connectivity Server can be mounted on top of the generator enclosure for extended Wi-Fi range.

1. Remove the conduit connector.
2. Remove the Control Cabinet cable from Power and RS-485 Connection (see [Figure 2-1](#), item B) of Connectivity Server.
3. Remove any other cables, including Ethernet cable, connected to Connectivity Server.
4. Follow instructions as outlined in the drawing supplied with A0000310806 extension kit to mount the Connectivity Server on top of generator enclosure.
5. Connect any other cables, including Ethernet cable, that were connected to Connectivity Server.
6. Use conduit connector to secure the Connectivity Server to the generator enclosure.

Cleaning

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

Connection Details

Connector	Description	Purpose	Wire # (Default)
PWR_RS485-5	12 V	Provides power to the Connectivity Server	15F
PWR_RS485-4	Ground		0C
PWR_RS485-3	RS-485 Ground	This is Modbus Master and is used to connect to Power Zone Pro Main Controller	0B
PWR_RS485-2	RS-485 -		393
PWR_RS485-1	RS-485 +		392
HDMI	High-Definition Multimedia Device connector	For Generac Engineering Use Only	–
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, Connectivity Server is powered.
 - If red LED is off, Connectivity Server 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.

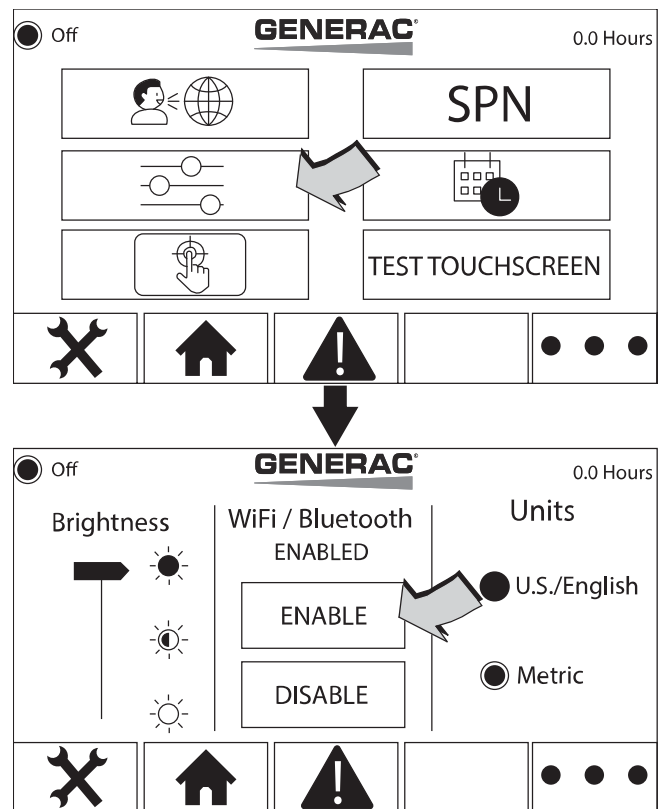
Connecting to the Connectivity Server

The Connectivity Server can be accessed via Wi-Fi, Bluetooth or Ethernet. ModBus RTU access can be enabled using a third party ModBus/RS-485 to USB converter.

NOTE: Do not enable Wi-Fi and Bluetooth simultaneously. If Wi-Fi is needed, disable Bluetooth. If Bluetooth is needed, disable Wi-Fi.

Wi-Fi Connection

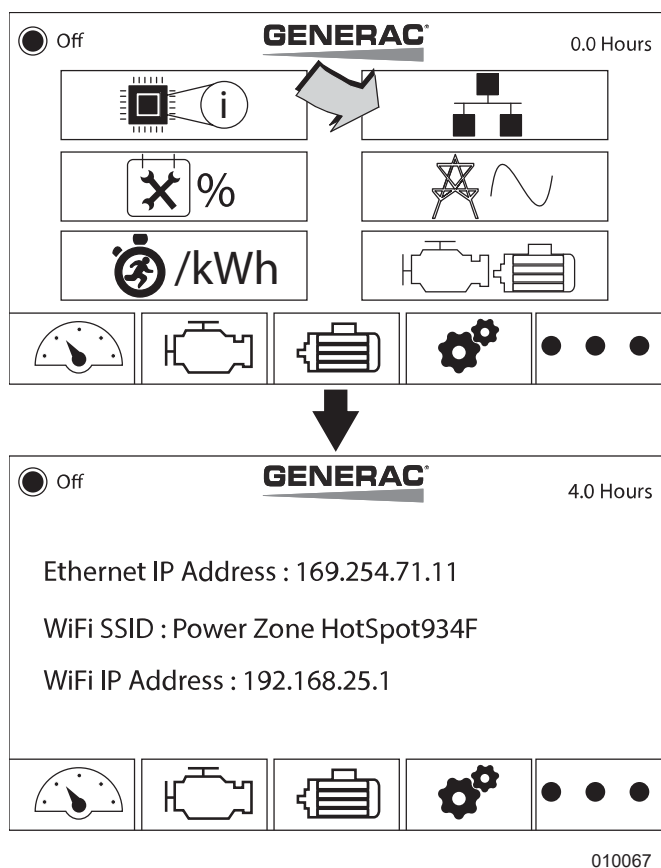
1. See [Figure 3-2](#). On the Power Zone Pro Main Controller Built-in Display, select “System Settings”.
2. Select “Enable” to enable Wi-Fi/Bluetooth. Wi-Fi and BlueTooth cannot be enabled at the same time.



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Figure 3-2. System Settings and Wi-Fi/Bluetooth Connection

3. See [Figure 3-3](#). To connect a mobile device to the Connectivity Server using Wi-Fi, the Wi-Fi SSID, password and IP address are required. This information can be accessed from the Power Zone Pro Main Controller “System Details” menu and by selecting “Network Info”.



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Figure 3-3. Network Info and System Details

4. Select the SSID (Service Set Identifier) on the mobile device or PC's Wi-Fi list. Enter the network password.

NOTE: The default Wi-Fi password ("generac123") can be changed.

5. Once connected, open a web browser (Google Chrome preferred) on the mobile device or PC and enter the following Wi-Fi IP address in the top bar of the browser:
– 192.168.25.1

Bluetooth Connection

1. Turn on Bluetooth on the mobile device or PC and Select "Scan" or "Pair".
2. Select the Power Zone BlueTooth device name on the mobile device or PC's Bluetooth list.
3. Once connected, open a browser (Google Chrome preferred) on the mobile device or PC and enter the following Wi-Fi IP address 192.168.25.1 in the top bar of the browser.

Ethernet Connection

1. See **Figure 3-3**. To connect via Ethernet, the Ethernet IP Address is required. This information can be accessed via the Power Zone Pro Main Controller "System Details" menu and by selecting "Network Info" (C).

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 connectivity server.

2. Connect Ethernet cable from the Connectivity Server 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 3-4**. 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 3-4. Home

Screen Layout

See **Figure 3-5**. 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 3-5. Screen Layout

Top Banner

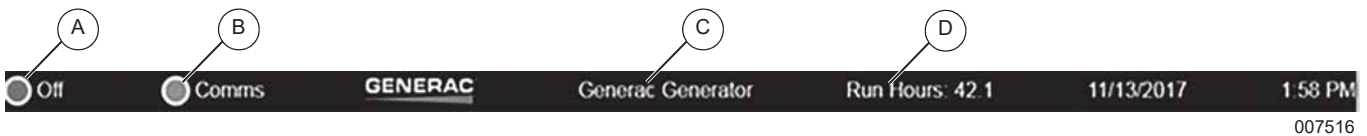


Figure 3-6. Top Banner Features

(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 Main 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 3-7**. To name the generator, go to Setup → Communications → Device Manager screen, press the Edit button (A) and enter the Friendly Name.

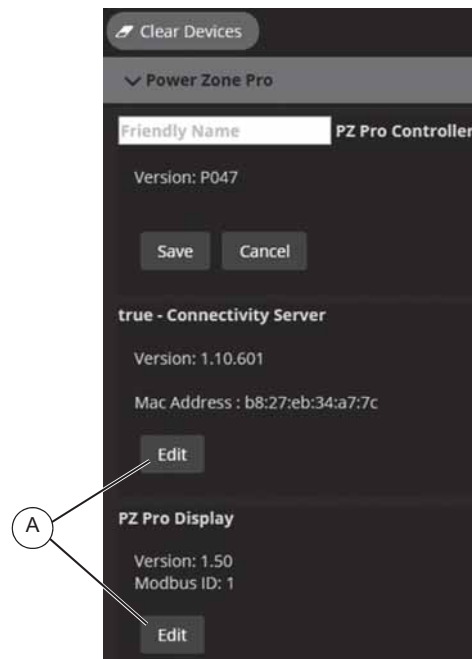


Figure 3-7. Edit Generator Name

(D) Run Hours

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

Bottom Banner

See [Figure 3-8](#). 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.

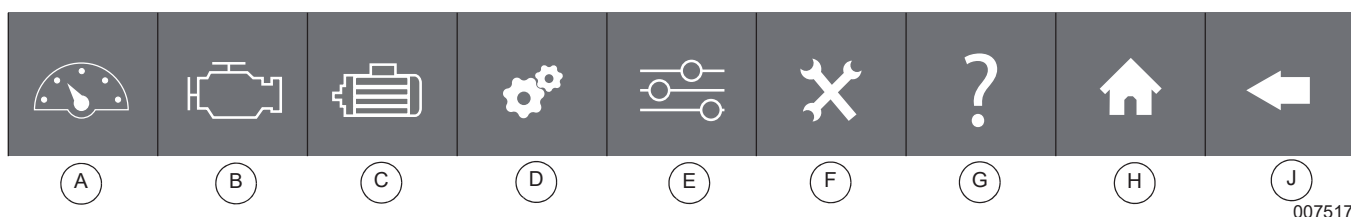


Figure 3-8. Bottom Banner Features

(A) Dashboard

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

- ON/OFF Status or Buttons
- Current Alarm and Warning status
- Maintenance Notes

(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 most of the I/O configurations and parameters for the generator.

(F) Tools

This icon provides access to items for diagnostics, trending, updates and screen tools.

(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 3-9**. The center of the screen contains data in the form of bargraphs. The bargraphs contain markers (A) that represent the trigger points for alarms and warnings. The markers are white lines. 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.

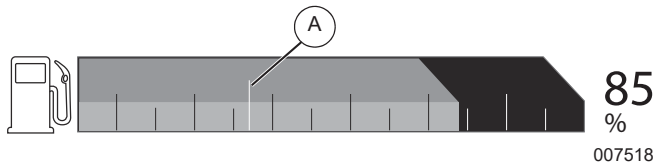


Figure 3-9. Bargraph

Alarm Ribbon

See **Figure 3-10**. 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.

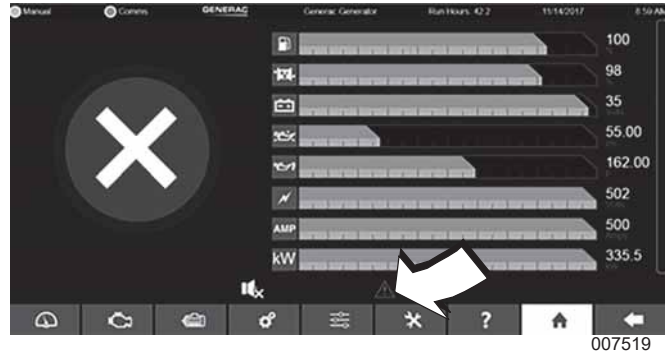


Figure 3-10. Alarm Ribbon

Screen Features

Scrolling

See **Figure 3-11**. Use a mouse to move the scroll bars.

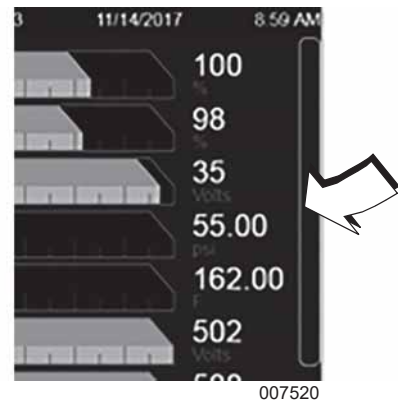


Figure 3-11. Scroll Bar at Edge of Screen

Language

See **Figure 3-12**. 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 Main Controller Built-in Display. To set the language, go to the **(E) Setup** icon, 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.

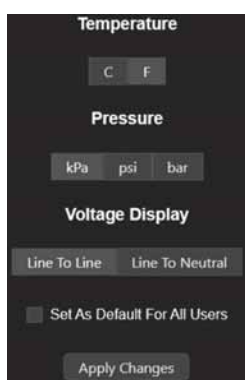


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Figure 3-12. Language Selection

Units of Measure

To set the units of measure go to the **(E) Setup** icon 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. Checking the “Set As Default” will apply the selection to the Built-in Display and all new remote users.

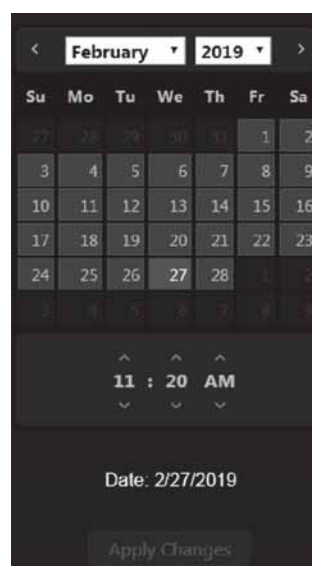


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Figure 3-13. Units of Measure

Date/Time

The system date and time can be set from the **(E) Setup** icon. Navigate to Setup → Calendar → Date/Time. Changing the date/time on the Connectivity Server 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.



009630

Figure 3-14. Date/Time

Health Checkmark

See **Figure 3-15**. The checkmark indicates the system is healthy.



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Figure 3-15. System is Healthy (Green)

See **Figure 3-16**, **Figure 3-17** and **Figure 3-18**. When the generator has an alarm or warning status, the checkmark will change to indicate the level of fault.



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Figure 3-16. Shutdown Alarm Condition (Red)



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Figure 3-17. Non-Shutdown Alarm Condition (Red)



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Figure 3-18. Warning Condition (Yellow)

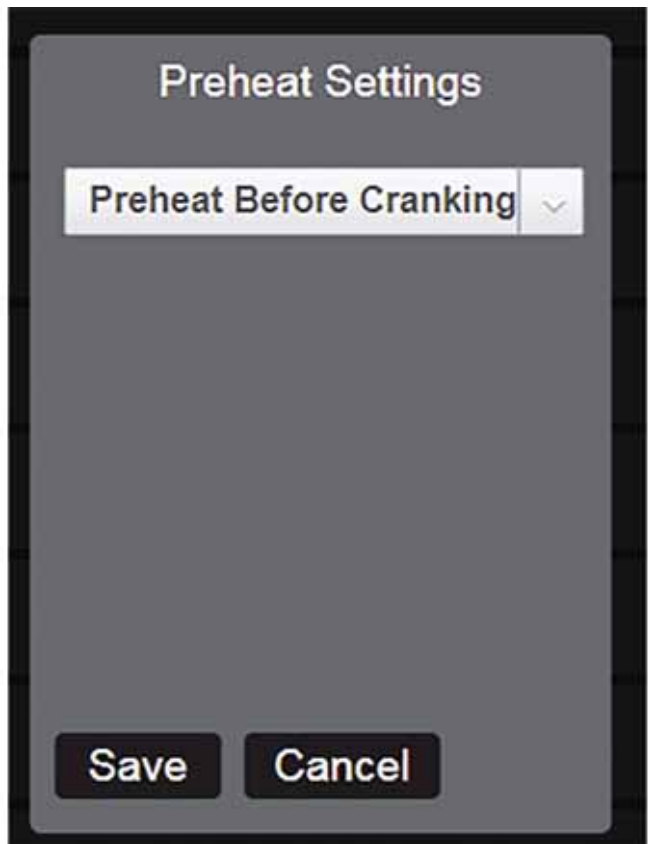
Editing

Editing of configuration parameter values is performed by two methods: by entering a value (Figure 3-19) or selecting a value using the pull down selection box (Figure 3-20).



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Figure 3-19. Numeric Value Editing (with ranges)



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Figure 3-20. 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.

System Dashboard Screen

See [Figure 3-21](#). This screen displays bargraphs for the most common measurements. Some values, such as frequency, will display in red when the unit is not running.



Figure 3-21. System Dashboard

AUTO/OFF/MANUAL

See [Figure 3-22](#). This screen displays the status of the keyswitch (if equipped). The generator can be remotely started and stopped from this screen.



Figure 3-22. ON/OFF Status

Maintenance Notes

See [Figure 3-23](#). 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 3-23](#). The notes can be edited or deleted by choosing the edit or delete small icons on the notes.

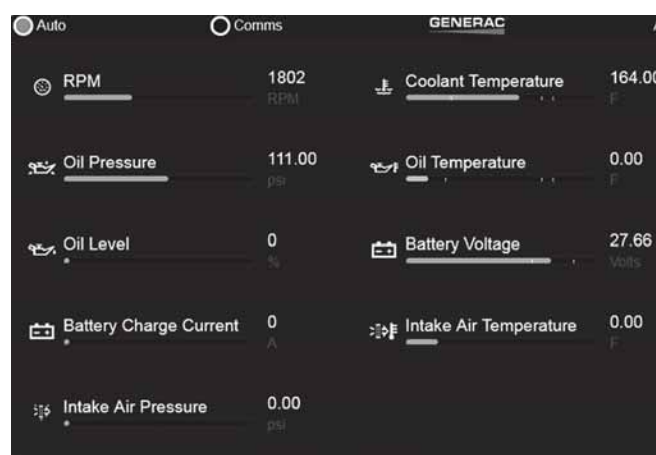


007532

Figure 3-23. Maintenance Notes

Engine Detail Screen

See [Figure 3-24](#). 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.



007631

Figure 3-24. Engine Screen

Engine Settings

See [Figure 3-25](#). 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 3-19](#).

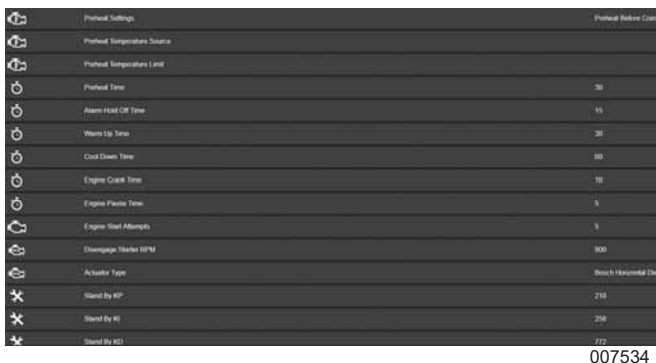


Figure 3-25. Engine Settings

Alternator Detail Screen

See **Figure 3-26**. The Alternator Detail Screen displays bargraphs of measured alternator parameters. In some cases the readings will be empty if the associated sensors are not fitted. The alternator screen also provides a button to access the Alternator Settings screen. This screen allows editing of alternator related configuration parameters.



Figure 3-26. Alternator Detail Screen

Alternator Settings

See **Figure 3-27**. 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 3-19**.



Figure 3-27. Alternator Settings

System Detail Menu

The System Detail menu provides access to the alarm history, event history, shutdown bypass alarm log, run times, maintenance remaining, nameplate data, dealer information, system notes and utility screens.

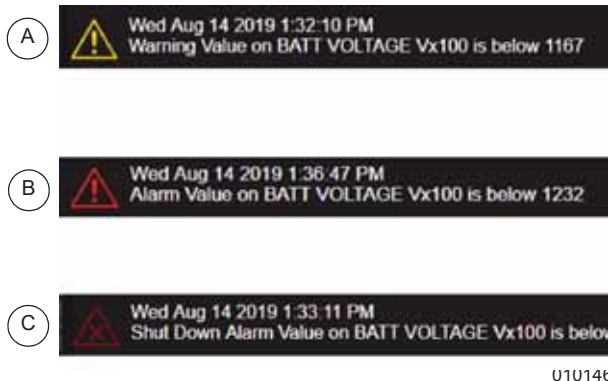
Alarms and Warnings

See **Figure 3-28**. 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 or shutdown alarm (B or C) 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. A shutdown alarm is highest severity and must be acknowledged. The generator will not operate when a shutdown alarm is present.

Alarms and Warnings are displayed with their respective icons to the left. The top text displays the date that the Alarm or Warning occurred. The bottom text displays the type of message, the associated function code and the value that caused the alarm to trigger.

NOTE: The displayed value is the value at the time the fault is triggered, not the setpoint for the condition.



A	Warning - Yellow (!)
B	Alarm - Red (!)
C	Shutdown Alarm - Dark Red (x)

Figure 3-28. Alarm and Warning Icons

See **Figure 3-29**. Press the “Acknowledge All” button (A) to acknowledge all active alarms. Once pressed, the icons for all active alarms with present conditions will turn white, and all other alarms will be removed from the list.

NOTE: This does not apply to warnings.

Press the “Reset All” button (B) to clear all active alarms and warnings. If the conditions for an alarm or warning are still present, they will reappear as new.

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

Press the “Sort” button (C) to list the alarms and warnings from newest to oldest, or from oldest to newest.

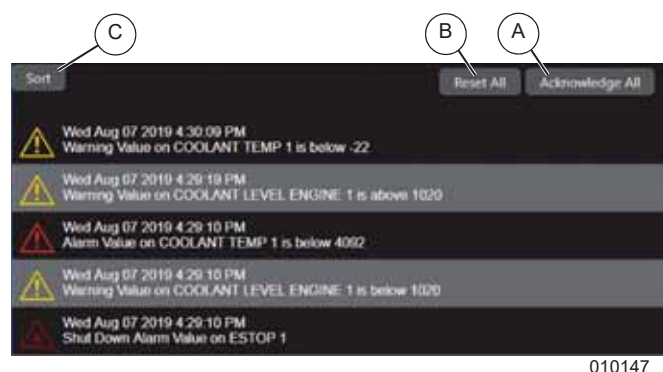


Figure 3-29. Sort, Reset and Acknowledge Alarms and Warnings

Alarm/Event History

See [Figure 3-30](#). The Alarm and Event History screens show a chronological list of alarms, warnings and events. Each alarm entry is date and time stamped and shows the source and value of the parameter at the time it occurred. The list filters to show alarms, warnings or events. Warnings and events from the warning history and event history are an optional filter and used for cross reference in time (events can include customer-defined events). The list is paginated and up to 1,000 alarms/warnings and 1,000 events can be stored.

The log exports to USB devices connected to the USB port of the Connectivity Server 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”.



Figure 3-30. Alarm History

Shutdown Bypass Alarms

See [Figure 3-31](#). The Shutdown Bypass Alarm screen shows a chronological list of shutdown alarms that occurred while the Shutdown Bypass Mode was active. Each alarm entry is date and time stamped and shows the source and value of the parameter at the time it occurred. It also includes the RPM, Current, Voltage, Frequency, and Coolant Temperature at the time of the fault. The list is paginated and displays up to 20 alarms. The log exports to USB devices connected to the USB port of the connectivity server or to the default download location of your browser. There is also an option to email the log to a list of recipients.

Download to USB drive:

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

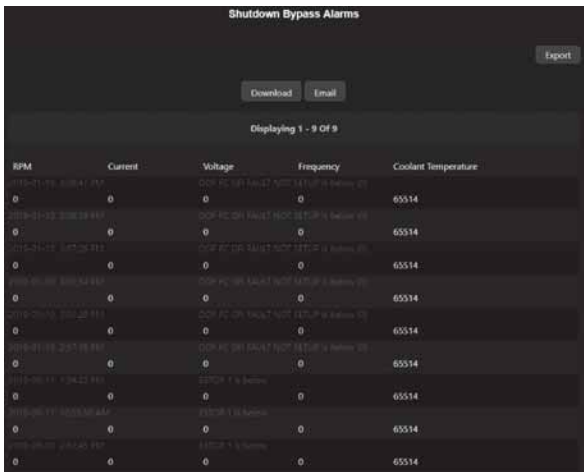
Download log to remote computer:

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”.

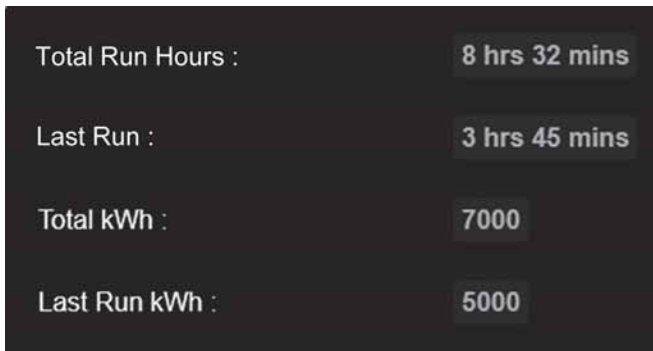


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Figure 3-31. Shutdown Bypass Alarms

Run Times

See [Figure 3-32](#). The Run Times screen shows the generator operation history.

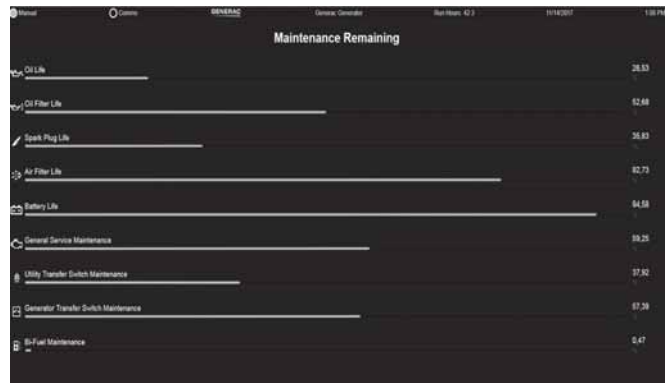


007536

Figure 3-32. Run Times

Maintenance Remaining

See [Figure 3-33](#). The Maintenance Remaining screen displays bargraphs and numeric values representing how far an item is into its maintenance cycle in units of percent. Maintenance intervals are editable from the **(E) Setup** → Calendar screen.

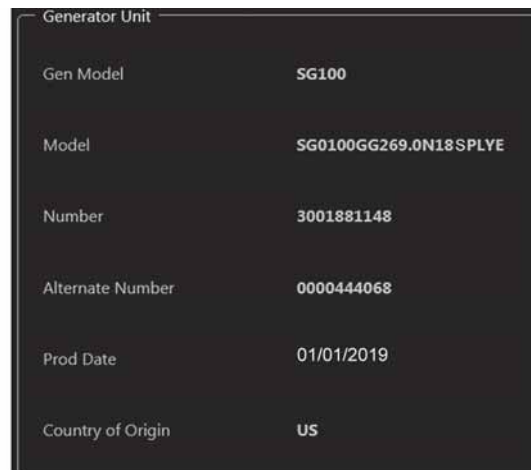


007537

Figure 3-33. Maintenance Remaining

Nameplate Data

See [Figure 3-34](#). The Nameplate Data screen displays generator information such as Generator model, Production Date, Country of Origin, kW rating and voltage.



007538

Figure 3-34. Nameplate Data

Dealer Information

See [Figure 3-35](#). The Dealer Information screen is an editable text field where dealer contact information is stored.

007539

Figure 3-35. Dealer 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.

Utility

See [Figure 3-36](#). The Utility screen displays bargraphs showing measured values for the utility.

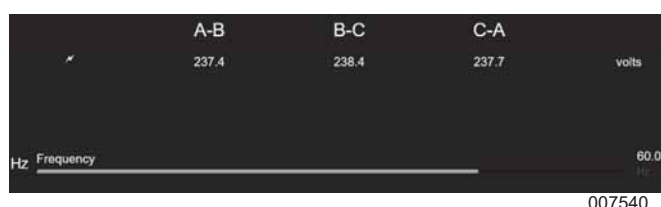


Figure 3-36. Utility

Setup Menu

The Setup menu provides access to the submenus for user, setups, calibrations, protections, calendars, modules, digital I/O, analog I/O 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 3-37](#). The System Setup screen is used to enter global settings about the generator.

007541

Figure 3-37. System Setup

Wiring type indicates single or three-phase generator wiring.

Switch type defines the type of generator output switch or breaker used. The options are:

- Contactor
- Motorized Breaker
- No Switch
- Pramac Cont Switch

Dual Fuel Setup

See [Figure 3-38](#). Dual Fuel settings (if applicable) can be set and adjusted using this screen. The drop down menu (A) contains four options:

- Disabled: Indicates the dual fuel setup is inactive.
- Digital Pressure: Indicates the generator is using a Digital Input Pressure Switch Sensor for primary fuel pressure sensing.
- Analog Pressure: Indicates the generator is using an Analog Input Pressure Sensor for primary fuel pressure sensing.
- Digital and Analog Input Pressure: Indicates the generator is using both Analog and Digital Input sensors for primary fuel pressure sensing (bad when either input is bad. Good when both inputs are good).

Dual fuel setup parameters (B):

- Return to Primary Fuel Delay (m): The period of time (in minutes) the generator continues to use the secondary fuel after detecting return of fuel pressure on the primary fuel.
- Transition Overlap Time: The period of time (in seconds) both fuel solenoids are turned on while transitioning between primary and secondary fuels.
- Analog Pressure Threshold: The minimum sensor value below which the primary fuel pressure is considered insufficient to continue running the generator.
- Analog Pressure Hysteresis: The value by which pressure has to increase above the threshold value for it to be considered valid after a loss of pressure was detected.

- Analog Pressure Loss Delay: The amount of time (in seconds) from the last good sensor value before the pressure sensor value is considered lost.

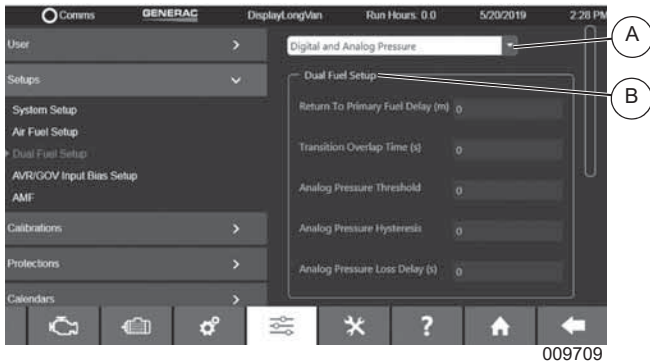


Figure 3-38. Dual Fuel Settings

See [Figure 3-39](#). Select the dropdown to choose which sensor(s), if any, are attached to the generator. Select “Disabled” if there are no sensors attached.

NOTE: The settings for Analog Pressure Threshold, Analog Pressure Hysteresis, and Analog Pressure Loss Delay(s) are only available when using an analog pressure sensor and are in the units of that sensor value.

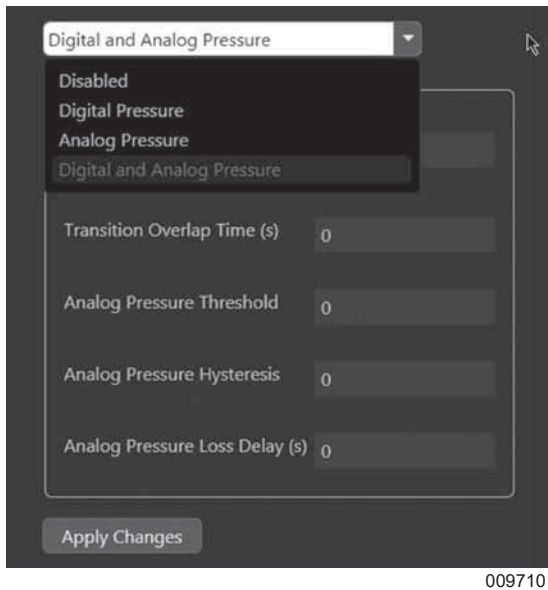


Figure 3-39. Sensors

See [Figure 3-40](#). As a precaution, the screen will indicate when a needed sensor channel is not setup for the configuration chosen. Select the “Setup Channel” button (A) to navigate to the appropriate I/O configuration screen. If all channels are set, this section will be empty. If the “Apply Changes” button (B) is selected and there are unassigned channels, the settings will be applied and a warning message will indicate a potential problem has been detected.



Figure 3-40. Setup Channel

Air/Fuel Setup

See [Figure 3-41](#). The Air/Fuel Setup screen is programmed at the factory to calibrate emissions and should not be adjusted.



Figure 3-41. Air/Fuel Setup

Auto Mains Failure (AMF)

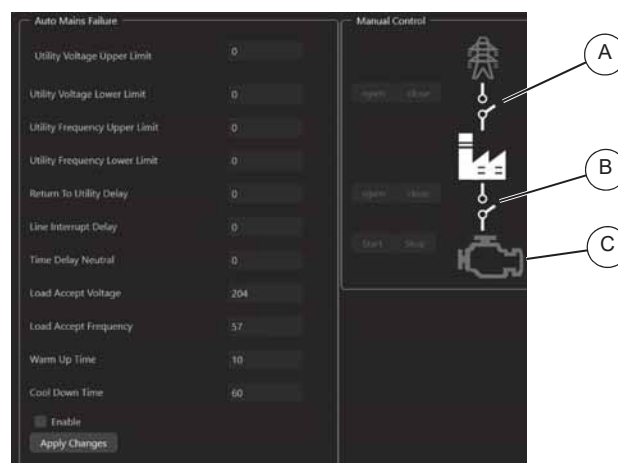
See [Figure 3-42](#). Auto Mains Failure (AMF) provides a way to control a non-intelligent transfer switch from the Power Zone Pro Main Controller. When AMF is enabled, the Controller monitors utility voltage and frequency, controls starting and stopping of the generator, and controls switching of the load from utility to generator and back again as needed. See [Table 1](#) for a description of each parameter.

To set the configuration:

1. Enter a value for each of the AMF settings.
2. Enable AMF by clicking the “Enable” check box.
3. Select “Apply Changes”.

The manual control buttons can be used to manually switch the load between the utility and the generator.

NOTE: The manual switching will only work if the power source meets the defined quality ranges. The load cannot be connected to both the utility and the generator at the same time.



009632

Figure 3-42. Auto Mains Failure

A	Utility Switch Open/Close
B	Generator Switch Open/Close
C	Generator Start/Stop

Table 1 - AMF Parameters

Setting	Range and Units	Description
Enable	Enabled or disabled	Enables or disables the use of AMF.
Utility Voltage Upper Limit	Volts, 103% - 130% of target voltage	Highest allowed utility voltage.
Utility Voltage Lower Limit	Volts, 50% - 97% of target voltage	Lowest allowed utility voltage.
Utility Frequency Upper Limit	Hz, 103% - 120% of target frequency	Highest allowed utility frequency.
Utility Frequency Lower Limit	Hz, 80% - 97% of target frequency	Lowest allowed utility frequency.
Return to Utility Delay	Seconds, 0 - 1800	The amount of time to delay switching the load back to utility once utility has been restored to be within the voltage and frequency ranges above. If voltage or frequency of the generator is outside of the acceptable range, the load will immediately switch back to utility.
Line Interrupt Delay	Seconds, 0 - 60	The amount of time the utility can be outside of the ranges above before the generator is started. If the generator is already running, the load will be switched immediately without line interrupt delay.
Time Delay Neutral	Seconds, 0 - 60	If the switch has a neutral position where the load is not connected to either generator or utility, this is the time the switch stays in the neutral position when transitioning the load between utility and generator.

Table 1 - AMF Parameters

Load Accept Voltage	Volts, 85% - 95% of target voltage	The minimum voltage the generator must provide before switching the load to generator.
Load Accept Frequency	Hz, 85% - 95% of target frequency	The minimum frequency the generator must provide before switching the load to generator.
Warm Up Time	Seconds, 0 - 1200	Amount of time after the generator reaches load accept voltage and frequency before switching the load to generator.
Cool Down Time	Seconds, 0 - 1200	Amount of time to run the generator after the load has been disconnected.

Calibrations (Voltage and Current)

See **Figure 3-43**. The Calibration screen is used to calibrate the hardware in the controller that measures AC voltages and currents. They are calibrated in the factory but may require fine tuning at site.



Figure 3-43. Calibrations

There are three general buttons:

- The Reset All button resets all calibration values to one (no calibration).
- The Restore button sets all calibration values back to the settings saved when this screen was opened.
- The Util-Gen Volts button will automatically calibrate the utility voltage readings to be the same as the generator voltage readings in a Utility monitoring system. The generator voltages must first be calibrated. The utility voltages can still be manually calibrated if desired.

Each of the channels can be manually calibrated with the aid of a CALIBRATED true RMS voltage meter or current clamp meter. Choose which channel to calibrate from the eight options. For example, if calibrating the Generator Line to Line (L-L) voltage, see **Figure 3-44** and follow the procedure below.

1. Select “Generator L-L” (A).
2. Start in the A-B voltage column (B). The Power Zone A-B voltage reading is dynamically displayed on the screen.

3. Use the meter (C) to read the A-B voltage manually.
4. Enter the meter reading onto the screen (resolution of 0.1 volts).
5. Click “Calibrate” (D). Calculations will be performed and a new calibration stored for that channel.
6. Repeat for readings B-C and C-A.

The same procedure can be used for all other channels, however for the Amp readings, a calibrated clamp meter is required.

NOTE: As the calibrations change for the voltages, the voltage on the meter will change due to the AVR targeting the new voltage.

NOTE: It is best to calibrate voltages at no load and currents a full load or the site expected full load.

NOTE: It is not normal for the meter reading to be more than 20% from the generator reading. If this occurs, verify all other related settings and parts are proper such as CT ratios.

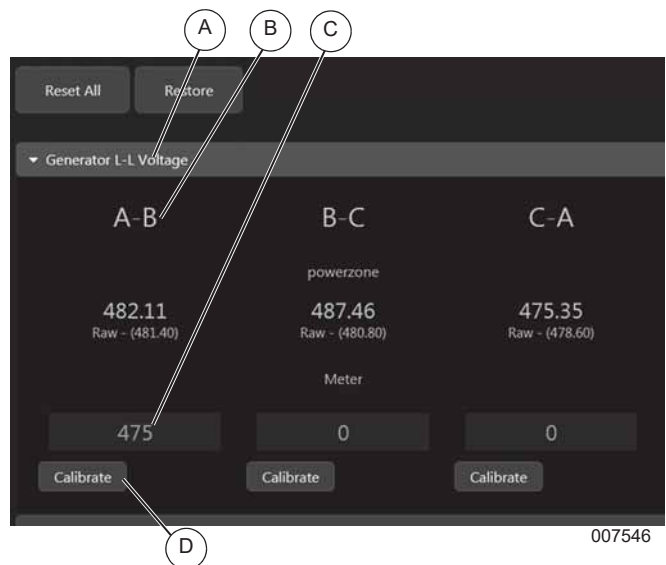


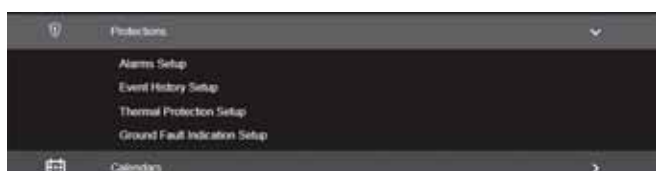
Figure 3-44. Calibration Example

Protections (Alarms, Event History, GFI, I²T)

See [Figure 3-45](#). The Protections screen is used to set custom alarms and warnings or edit existing alarms and warnings for most of the measured values in the system. The events can be logged or emailed. This screen is also used to set up the GFI (Ground Fault Indication) Parameters and the I²T (sum of current squared over time used to estimate thermal affects of current) protections.

NOTE: Before setting up protection alarms or events, the Input and Output configurations must be setup for all the measurement channels.

Normally these channels are setup at the factory. If they need to be changed, see [\(E\) Setup](#) → Analog I/O and Setup → Digital I/O for details on this process.



007547

Figure 3-45. Protections

For alarm and event setups the measured values are read from “channels” where a channel may be a physical input such as a voltage or digital level, or a computed value such as kVAR. These protections are further divided into subsections to make it easier to choose. Select Alarms Setup to choose from [Digital Input Alarms](#), [Digital Output Function Alarms](#) or [Analog Input Alarms](#).

NOTE: Alarms and Warnings can be configured to transmit an email to a list of recipients.

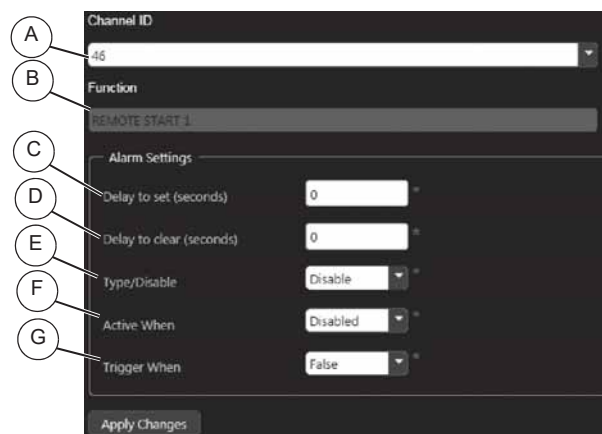
Digital Input Alarms

See [Figure 3-46](#). Follow the procedure below to setup Digital Input Alarms.

1. Select the channel ID to set an alarm on (A). The function of the channel will be displayed in the Function box (B).
2. Enter a “delay to set” time (C). This is the amount of time the alarm condition must be active before the alarm is set (resolution of 0.1 seconds).
3. Enter a “delay to clear” time (D). This is the amount of time the alarm condition must be inactive before the alarm is cleared (resolution of 0.1 seconds).
4. Enter the type of alarm (Warning, Alarm, or Shutdown) (E).
5. Choose when the alarm becomes active (Always, Immediate, or Hold Off delay) (F). Always means the alarm condition is always being evaluated. Immediate means the alarm condition is only evaluated while the generator is rotating. Hold Off means the alarm condition is only evaluated after a

means the alarm condition is only evaluated after a hold off timer has expired after the generator started running.

6. Set the trigger level (G) as True or False.
7. Select “Apply Changes” to save the settings.



007548

Figure 3-46. Digital Input Alarms

Digital Output Function Alarms

The setup for these alarms is the same process as for [Digital Input Alarms](#) but with a different function list.

Analog Input Alarms

Up to four alarms or warnings can be set on any one channel. A Sensor Fault type alarm can also be set, which allows the user to select a range (see [Sensor Fault Setup](#)). Follow the procedure below to set an alarm or warning.

1. See [Figure 3-47](#). Select the channel ID to set an alarm on (A). The function of the channel will be displayed in the Function box (B).
2. Enter a hysteresis value (C), if required, in the units of measure. This value is used to prevent alarms from rapidly switching on and off as the value crosses the alarm threshold. As an alarm is generated the value must change by the hysteresis value before it clears and can be set again. For example if we have a warning when temperature exceeds 205 °F (96 °C) and a hysteresis of 9 °F (5 °C), then the temperature must drop below 196 °F (91 °C) before the warning clears and can be set again.
3. Enter the alarm type (Warning, Alarm, or Shutdown) (D).
4. Choose when the alarm becomes active (Always, Immediate, or Hold Off) (E). Always means the alarm condition is always being evaluated. Immediate means the alarm condition is only evaluated while the generator is rotating. Hold Off means the alarm condition is only evaluated after a

hold off timer has expired after the generator started running.

5. Enter the setpoint value in the units of measure (F).
6. Check either greater than (GT), or less than (LT) (G).
7. Enter a delay time (H). This is the amount of time the alarm condition must be active before it is set.
8. Select “Apply Changes” to save the settings.

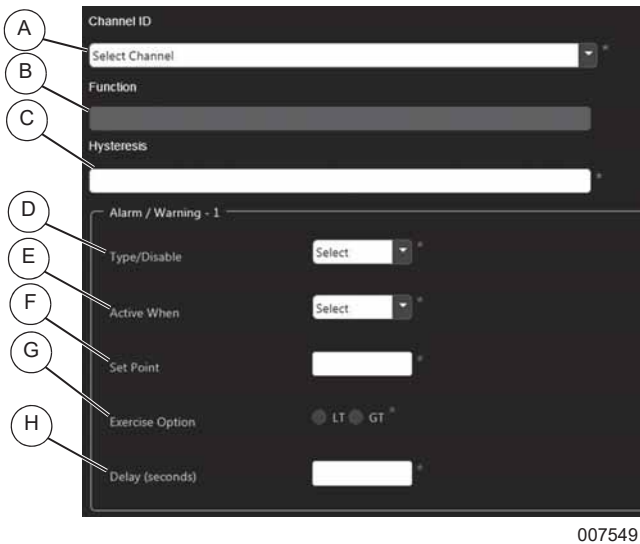


Figure 3-47. Analog Input Alarms

Sensor Fault Setup

Sensor fault alarms can be used to detect sensor readings which are out of valid ranges such that they indicate the sensor or its connection are faulty. Thresholds are typically evaluated against the raw analog readings. To configure the sensor fault ranges for an analog input:

1. Select the channel ID of the sensor for which you want to define sensor fault ranges.
2. See [Figure 3-48](#). In the Sensor Fault area, select the type of sensor fault (A). Sensor faults can be a warning, alarm, shutdown or disabled.
3. Select when the sensor fault will be active (B), choices are No Mode, Always, Immediate, and Hold Off.
4. Set the GT Setpoint (C), this is the value above which any reading is considered faulty.
5. Set the LT Setpoint (D), this is the value below which any reading is considered fault.
6. Enter the number of seconds to delay (E) after the threshold is reached before triggering the fault.
7. Select “Apply Changes” (F) to save the settings.



Figure 3-48. Sensor Fault Setup

Event History Setup

See [Figure 3-49](#). The Event History Setup screen allows you to record a timestamped event in the event log. An event can be a digital or analog event, for example when oil pressure exceeds 200 psi. The example below shows the setup for a digital event.

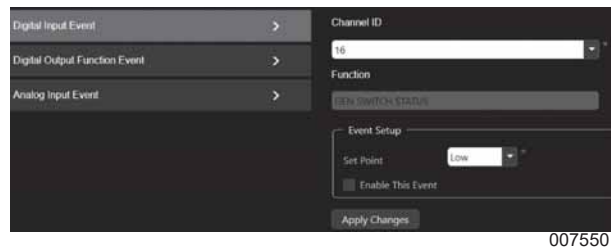


Figure 3-49. Event History Setup

Thermal Protection Setup (I²T)

Limiting at 300% Rated Current

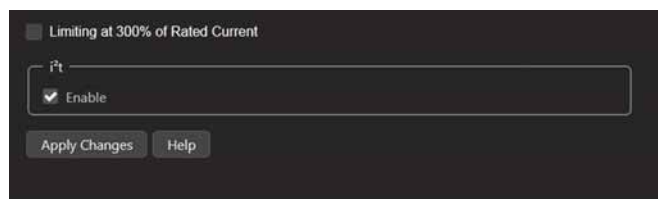
The 300% Rated Current Limiting feature limits the maximum output current on all legs of the alternator to less than 300% of the rated current of the generator. When this feature is enabled, the current is controlled so downstream breakers have a better chance of isolating the fault. When this feature is not enabled, the Main Circuit Breaker (MCB) might trip before the downstream breakers can isolate the fault.

I²T Enabled

The i^2t algorithm monitors the maximum output current on all legs of the alternator and integrates the square of the maximum current with respect to time. When this feature is enabled and the integral reaches the normalized value of “90”, a shutdown fault is triggered. When this feature is not enabled, the current is not monitored in this way.

Examples:

- 3 x rated current for 10 seconds is $3^2 \times 10 = 90$
- 1.1 x rated current for 74 seconds is $1.1^2 \times 74 = 90$

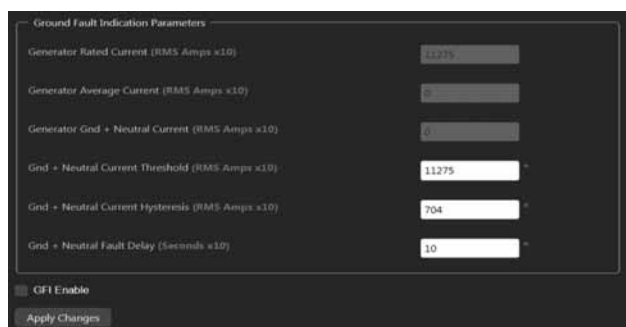


007551

Figure 3-50. Thermal Protection Setup

Ground Fault Indication (GFI)

See [Figure 3-45](#). The GFI feature is used to indicate when there is a higher than desired combination of ground current and neutral current. The default threshold is the rated current of the generator with a one second delay to trigger indication. This screen allows the operator to enable/disable GFI, change the threshold, change the hysteresis for the threshold, and change the delay time for triggering the indication. Refer to “PRGM (GFI) GROUND FAULT INDICATION POWERZONE” (part no. 10000044416) for setup instructions.



007845

Figure 3-51. Ground Fault Indication (GFI)

Calendars

See [Figure 3-52](#). The Calendars screen displays date and time related functions.



007552

Figure 3-52. Calendars

Set Date/Time

This is covered in [Date/Time](#).

Exercise Setup

See [Figure 3-53](#). This screen is used to setup Single generator exercise command. The command calendar can be used to set up a generator exercise command. 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.



007737

Figure 3-53. Exercise Setup

Maintenance Setup

See **Figure 3-54**. This screen is used to setup maintenance intervals for the generator. Intervals can be set to different units as appropriate for the equipment. To set a maintenance interval, select the equipment of choice.



Figure 3-54. Maintenance Setup

See **Figure 3-55**. Since maintenance intervals can depend on several factors, up to three cycle types can be selected. In this example, oil life can be determined by both date and run hours. Whichever interval is reached first causes a maintenance warning to occur. The screen that shows maintenance life remaining as a bargraph will show the shorter of the two intervals.

Operation as a Cycle Type is valid only for Battery Life, Utility Transfer Switch Maintenance or Generator Transfer Switch Maintenance. For Battery Life, it is number of start attempts of the generator. For Utility or Generator Transfer Switch, it is changes in switch position.

“Installed At” is the value of the selected cycle type at the time of last maintenance.

“Duration” is the amount by which the installed at can increase before maintenance is again required.

In the example in **Figure 3-55**, the oil was last serviced at 100 engine hours and will need to be serviced again when 200 additional engine hours have been logged at 300 engine hours.



Figure 3-55. Oil Life Maintenance Setup

Modules

See **Figure 3-56**. This screen allows you to select which module you wish to setup. The Automatic Voltage Regulator (AVR) and Governor are covered by the Alternator setup section and the Engine setup section.

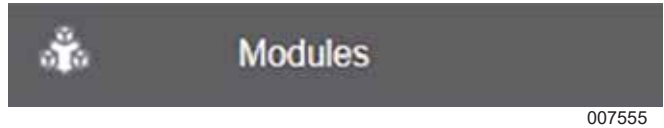


Figure 3-56. Modules

Remote Annunciator Setup

See **Figure 3-57**. The Remote Annunciator module has its own setup screen which allows the user to define the functions of the optional relays inside the annunciator and the spare light. Setup does not affect the function of the LEDs. Communication with the annunciator is via RS-485 interface and is set up on the Communication Setup screen.



Figure 3-57. Communication Setup

There can be up to 16 RS-485 annunciators in a system, so the user must define which annunciator is being set up.

IMPORTANT NOTE: Verify you have set up the communications with the annunciator first.

On the Annunciator Setup screen, select the annunciator from the first drop down box RAP Friendly Name.

For each relay in the annunciator, select a function from the drop down box. If the relay is not used, select Unused. Select Normally Closed or Normally Open using the radio buttons for each relay. Repeat for all relays as needed and save the settings.

NOTE: Pressing the “Defaults” button will erase all current relay selections and they will all need to be entered again.

Digital I/O

Digital inputs are automatically mapped to certain places and used within the program. Further custom mapping such as an input to an output can be performed by the user as desired. Mapping is performed by channel numbers.

Digital Outputs and Digital Output Functions follow a similar concept with Channels and Function names. The term Digital Output refers to a physical output, and setting up a Digital Output maps a Source to operate that physical output. A Source can be a Digital Input called a Physical Source, an internal control output (such as “Crank”) called a Control Source, or a Digital Output Function. There are 48 possible channels an output can be mapped to, but there are only 21 physical outputs on the Main Controller. This is to allow for future expansion. The term Digital Output Function (DOF) refers to a list of possible program outputs which are not necessarily needed for program operation, but could be useful to a user. Up to 208 DOFs can be configured for use.

Digital Input (DI) Setup

1. See [Figure 3-58](#). Select the digital input channel to modify by clicking on its name in the Digital Input Diagnostics screen.
2. Select the physical input source (A).
3. Select the function code (B).
4. Check the “Invert” box (C) to change the digital polarity if desired. “Invert” means a grounded input pin will show as “HIGH”.
5. Click “Apply Changes” (D).

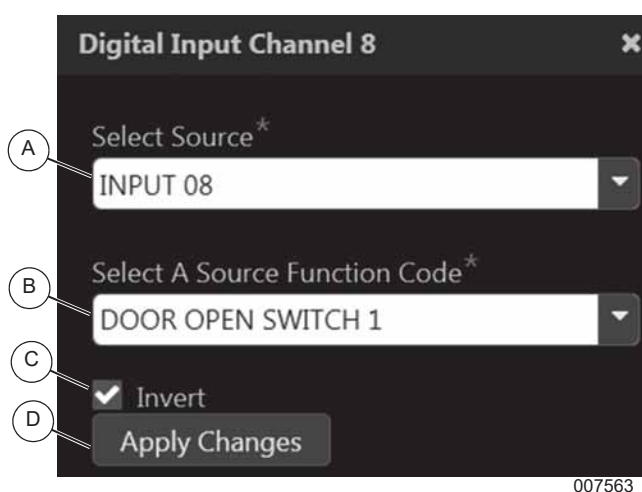


Figure 3-58. DI Setup

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Digital Output Function (DOF) Setup

To configure a digital output function channel:

1. Select an unused channel number by pressing the "Show Null Functions" button.
2. If selecting a User Config DOF, an Alternate Name must also be provided.
3. Select “Apply Changes”.

Digital Output Channels (DO) Setup

1. See [Figure 3-59](#). Select an unused channel ID by selecting the digital output channel name in the Digital Output Diagnostics screen.

Channel	Function	Alternate Name	Status
1	START RELAY		LOW
2	STOP RELAY		LOW
3	FASE RELAY		LOW
4	BELL FUNCTION		LOW
5	IGNITION RELAY		LOW
6	GAS RELAY		LOW
7	MPS CONNECTED TO BUS IN BACKUP		LOW
8	MCR TRIP		LOW
9	BELL FUNCTION		LOW
10	CONNECTED TO BUS		LOW
11	TRIP RETURN		LOW
12	BELL FUNCTION		LOW
13	BELL FUNCTION		LOW
14	GENERATOR CLOG 1		LOW

010388

Figure 3-59. DO Diagnostics

2. Select the channel ID. The channel ID is the same as the output.
3. See [Figure 3-60](#). Select the type of source (a pick list will be displayed) (A). Physical Source is for mapping a Digital Input Function to the Output. Control Source is for mapping an internal control signal to the Output. DOF is for mapping a Digital Output Function to the Output.
4. Select the required function code (B).
5. Check the “Enable” box (C) to enable the output.
6. Check the “Invert” box (D) to invert the digital polarity, if desired. “Invert” means the pin is grounded when the output shows as “HIGH”.
7. Click “Apply Changes” (E).

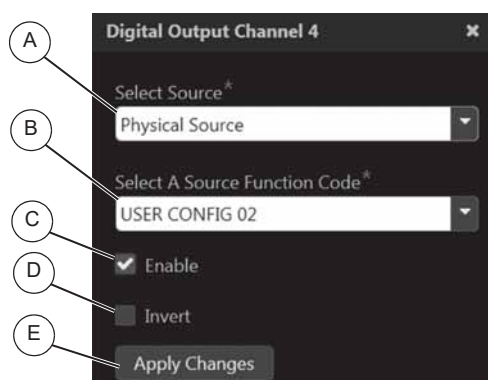


Figure 3-60. DO Setup

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Analog I/O

Analog I/O is based on the similar Channels and Functions system used by the *Digital I/O*.

Analog inputs usually come preprogrammed from the factory. An analog input (to the program) can be a real physical analog input or it can be a computed (or derived) input. For example, kW can be an analog input to the program, but it is computed (derived) based on multiple measurements, not read from an input pin. Analog inputs can also come from modules attached to the Power Zone system via CAN bus.

Analog inputs are automatically mapped to certain places and used within the program (see “Analog Input Mapping” diagram below). Further custom mapping such as an input to an output can be performed as desired. Mapping is performed by channel number.

Physical analog inputs (inputs that have a physical pin) can be of different hardware types:

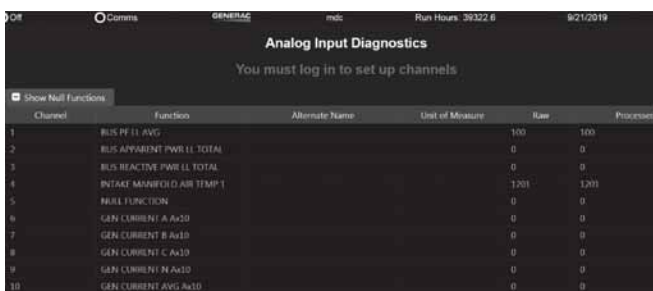
- 0-1 V
- 0-5 V
- 0-10 V
- Resistive
- 4-20 mA

The hardware must be set up to accommodate each of these inputs.

Analog readings from sensors often need to be converted from raw A/D counts to usable units. This can be performed by applying a simple "Mx+B" calibration equation, using an up to 10 point translation table, or combining the calibration equation and a translation table.

Analog Input (AIN) Setup

1. See *Figure 3-61*. Select an unused channel ID by selecting the analog input channel name in the Analog Input Diagnostics screen.

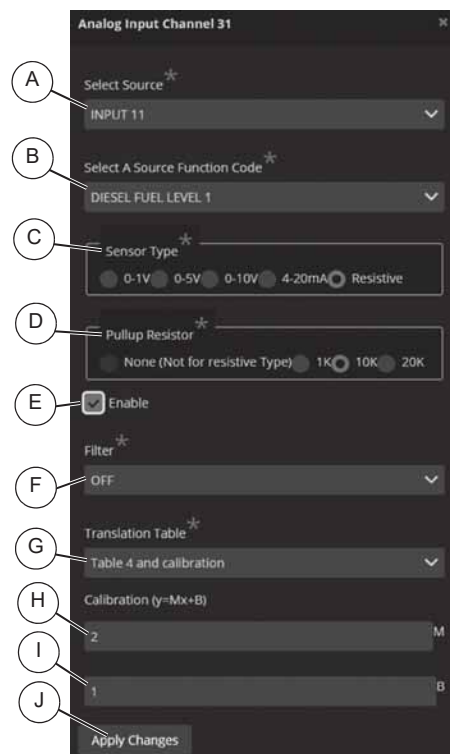


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Figure 3-61. Analog Input (AIN) Diagnostics Screen

2. See *Figure 3-62*. Select the input source (a pick list will be displayed of physical, derived or CAN bus inputs) (A).
3. Select the function code (B).

4. Select the sensor type (see sensor datasheet if unknown) (C).
5. If the sensor is a resistive type, select a pull up resistor (D). You may need the Generac tool in conjunction with the sensor datasheet to choose this. The pullups are used when the sensor is a passive resistance to ground. The pullup value is selected based on the resistance range of the sensor.
6. Click the “Enable” checkbox (E) to enable the channel. If you are not using the channel, do NOT check “Enable”, as it slows down the processing time.
7. Apply filtering (F) to the reading if necessary. The larger the number entered, the slower the response will be. See *Table 2* for time constants on the filters.
8. Choose the way the reading is translated (raw, calibration and/or table) (G).
9. If the reading is to be calibrated, enter the appropriate “M” and “B” values (H) and (I).
10. Click “Apply Changes” (J).



007568

Figure 3-62. Analog Inputs (AIN) Setup

Table 2 - Time Constants on Filters

Filter Setting	Time Constant (ms)
0	No filter
1	No filter
2	14
3	15
4	16
5	18
6	20
7	23
8	27
9	34
10	48
11	90

Analog Output (AO) Setup

Analog outputs can be 0 to 10 V_{rms} voltage outputs, or they can be 0 to 100% duty cycle PWM outputs. They usually come preprogrammed from the factory. An analog output is wired to a physical pin, either PWM or 10 bit D/A. The source for an analog output can be mapped from several places including mapping an analog input to an output.

Analog Voltage Channels

- Channel ID 1 maps to connector pin BS3-9
- Channel ID 2 maps to connector pin BS3-10

Analog PWM Channels

- Channel ID 3 maps to connector pin BS2-15
- Channel ID 4 maps to connector pin BS2-16
- Channel ID 5 maps to connector pin BS2-17
- Channel ID 6 maps to connector pin BS2-18
- Channel ID 7 maps to connector pin BS2-19
- Channel ID 8 maps to connector pin BS2-20
- Channel ID 9 maps to connector pin BS2-21

The analog output screens display differently depending on the type of output selected (Analog vs PWM). **Figure 3-63** shows an example of analog output sourced from an analog input.

1. Select channel ID by clicking on the channel ID name in the Analog/PWM Output Diagnostics screen (see **Figure 3-63**). The channel ID selects

- the analog output pin where channel IDs 1-2 are analog voltage and 3-9 are PWM pins.
2. Select the source type (A) as analog or control. A different pick list will be displayed for each.
3. Select the function code (B) from the pick list.
4. Scale the output (C). Numbers are entered in the units the source is measured in. Enter the value at which the output should be 10 V_{rms}. Enter the value at which the output should be 0 V_{rms}. This scales the output voltage to the source (in source units).
5. Check the “Enable” checkbox (D) to enable the output.
6. Click “Apply Changes” (E).

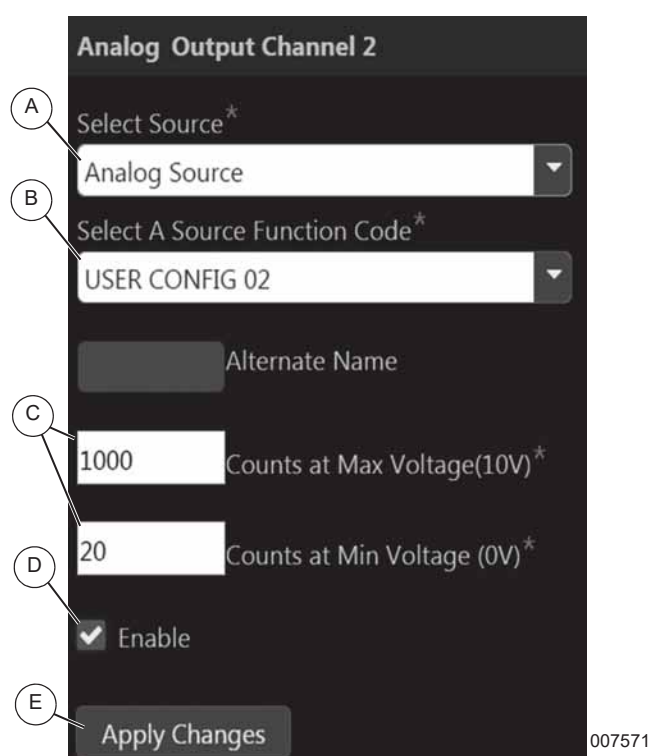


Figure 3-63. Analog Output (AO) Mapping

1. **Figure 3-64** shows an example of PWM output sourced from an internal control source. Channel ID 5 (A) is chosen by the user because it is a PWM analog output type.
2. Select the source type (B) as analog or control. A different pick list will be displayed for each.
3. Select the function code (C) from the pick list.
4. The module frequency (D) is fixed, and it depends on the chosen channel. It is displayed as reference only. The module frequency dictates the final PWM frequency.
5. Select the Frequency prescaler (E) and PWM counts (F) to set the final PWM frequency by the indicated formula. The PWM counts value

represents a 100% duty cycle. The output duty cycle is the analog or control value divided by the PWM counts value. In this example, a control value of 33 divided by the PWM counts of 100 would result in a 33% duty cycle.

6. The Computed PWM Frequency (G) will be displayed.
7. Check the “Enable” checkbox (H) to enable the output.
8. Check the “Invert” checkbox (I) to invert the signal if required. For example, if the duty cycle is 75% it will change to 25%. A duty cycle of 100% will invert to full off. Only PWM outputs can be inverted.
9. Select “Apply Changes” (J).

NOTE: PWM outputs share pins with digital outputs and both should not be enabled at the same time.

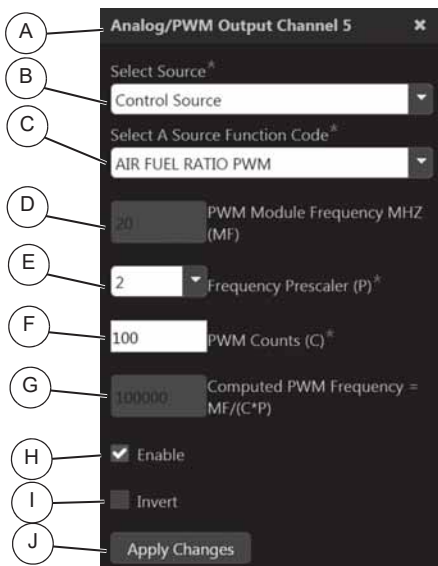


Figure 3-64. PWM Type Output

007572

Communications

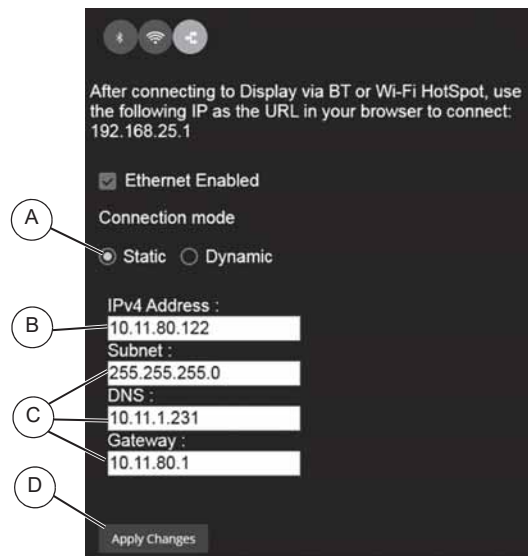
The Communications screens are used to configure the external network connections to the Connectivity Server (Ethernet, Wi-Fi and Bluetooth). You can view the modules present on the internal Modbus RTU network through the Device Manager and configure Email messaging and Modbus Pass-through (TCP or RTU).

Wi-Fi and Ethernet Port Setup

Static IP Address Configuration for Ethernet

1. See [Figure 3-65](#). Navigate to (E) **Setup** → Communications → Ethernet/Wi-Fi/Bluetooth.
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).



007573

Figure 3-65. Static IP Address Configuration for Ethernet

Dynamic IP Address Configuration for Ethernet

1. See [Figure 3-66](#). Navigate to: Setup → Communications → Ethernet/Wi-Fi/Bluetooth.
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.



007574

Figure 3-66. Dynamic IP Address Configuration for Ethernet

Wireless LAN Client Setup - Search and Connect to Access Point

1. See [Figure 3-67](#). Select “Client” (A). If there is an existing client mode connection, the SSID of the currently connected Wi-Fi network will be displayed following the text “Connected To”. If there is no

existing client mode connection, the SSID of the most recently connected Wi-Fi network will be displayed following the text "Current saved profile".

2. Select "Country Code" (B) to match the country the Client mode will be present in.
3. Click the drop down menu for Channel ID (C).

The channel with the least interference will be chosen when selecting Auto, otherwise the channel ID selected will be used for providing Wi-Fi service. The list of channels will change according to the country selected as each country has its own list of supported channels.

Default Wi-Fi network name is Power Zone HotSpot. The name can be changed by selecting the text box (D) below "Channel ID".

4. Select/Deselect "Broadcast SSID" (E) to broadcast/not broadcast the SSID of the client. When not selected, the SSID will not be broadcast over the air. The user will have to manually enter the SSID in their Wi-Fi Client set up to connect to the client.
5. WPA2 will be automatically selected as the security protocol to be used for Client connections.
6. A password must be entered to connect to this access point (G). Password can be shown in plain text or hidden by clicking on the "Show Password" box next to the password.
7. Click "Apply Changes" (H) to place the Connectivity Server in Client mode with the settings selected.

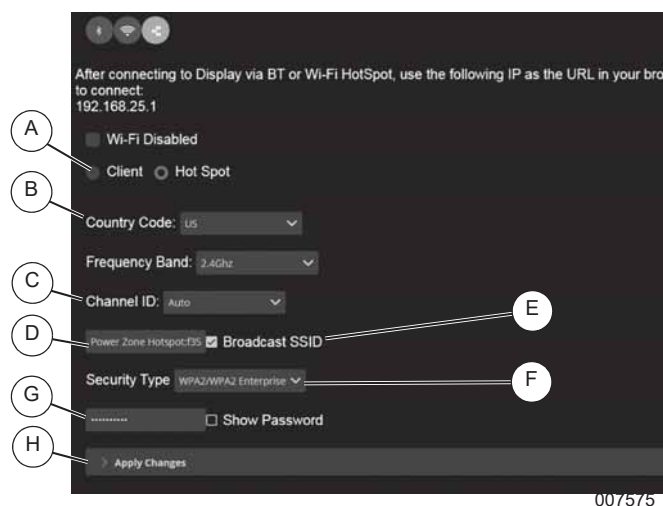


Figure 3-67. Wireless LAN Client Setup

Wireless LAN Client Setup - Manual Connection to Access Point

The Wi-Fi IP address will be assigned by the Wi-Fi network. Static IP addresses are not supported for Wi-Fi connections.

1. See [Figure 3-68](#). Click the "Manually Enter Wi-Fi" checkbox (A).
2. Enter SSID (Service Set Identifier) (B).
3. Enter network password (C) as required by network configuration.
4. Click "Connect" (D) to connect to wireless network.
5. Status message will be displayed after clicking "Connect".

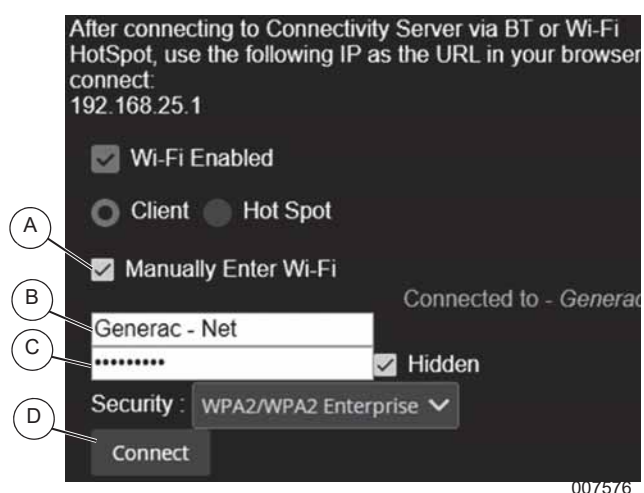


Figure 3-68. Wireless LAN Client Setup

Hotspot Mode

1. See [Figure 3-69](#). Check the "HotSpot" radio button (A).
2. Select "Country Code" (B) to match the country the HotSpot mode will be present in.
3. Click the drop down menu for Channel ID (C).

The channel with the least interference will be chosen when selecting Auto, otherwise the channel ID selected will be used for providing Wi-Fi service. The list of channels will change according to the country selected as each country has its own list of supported channels.

Default Wi-Fi network name is Power Zone HotSpot. The name can be changed by selecting the text box (D) below "Channel ID".

4. Select/Deselect "Broadcast SSID" (E) to broadcast/not broadcast the SSID of the hotspot. When not selected, the SSID will not be broadcast over the air. The user will have to manually enter the SSID in their Wi-Fi Client set up to connect to the hotspot.
5. WPA2 will be automatically selected as the security protocol to be used for HotSpot connections.
6. A password must be entered to connect to this access point (G). Password can be shown in plain text or hidden by clicking on the "Show Password" box next to the password.

- Click “Apply Changes” (H) to place the Connectivity Server in Hotspot mode with the settings selected.

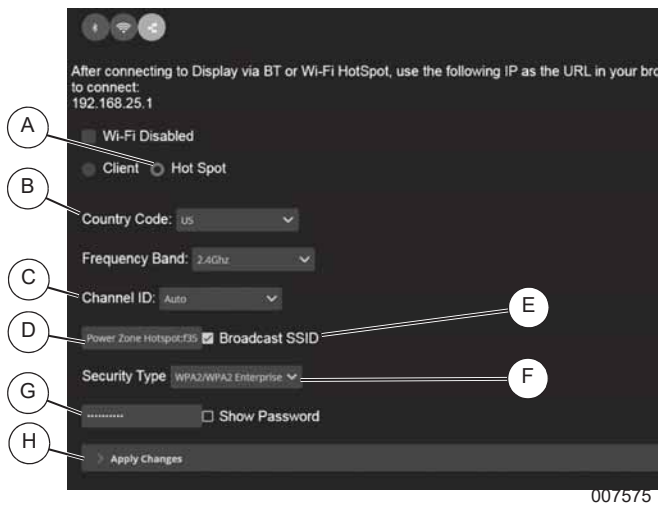


Figure 3-69. HotSpot Tab

The Connectivity Server can be in one of three modes exclusively:

- Off
- Client
- Hotspot

Turn Wi-Fi OFF or ON

- See [Figure 3-70](#). In either Client or HotSpot tab, check the “Wi-Fi Enabled” checkbox (A) to turn Wi-Fi ON and uncheck to turn OFF.

NOTE: Wi-Fi and Bluetooth cannot be enabled at the same time.



Figure 3-70. Toggle Wi-Fi

Bluetooth Setup

A network connection can be made between the Connectivity Server and a laptop, tablet, or smartphone using Bluetooth. The Power Zone Connectivity Server acts as the host and offers networking service to the connected device. With this connection, the web browser on the connected device can be used to view the Power Zone Application remotely.

The Bluetooth setup consists of three steps:

- Turning on Bluetooth on both devices
- Pairing
- Performing a separate connect action from each connected device.

Turn Bluetooth OFF or ON

- To get to the screen shown in [Figure 3-71](#), go to: Settings → Communications → Ethernet/Wi-Fi/Bluetooth.
- Check the “Bluetooth Enabled” checkbox (A) to enable or disable Bluetooth.
- Select the “Apply” button (B).
- Follow the connecting device instructions to turn Bluetooth ON.

NOTE: Wi-Fi and Bluetooth cannot be enabled at the same time.

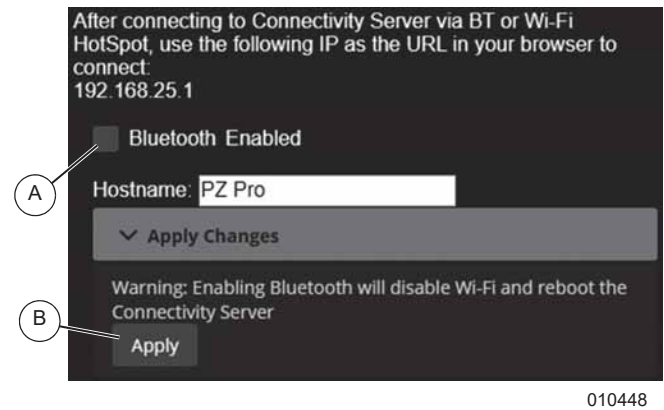


Figure 3-71. Turn OFF/ON and Pair Bluetooth Device

Connect and View Power Zone App on Web Browser of Connected Device

A user initiated action is required to connect the two Bluetooth devices. The action consists of executing steps on the guest device. The Connectivity Server is the host. Each operating system has different procedures to establish a network connection between the Connectivity Server and device. The following procedure is based on Windows 7 operating system (OS).

- See [Figure 3-72](#). Locate and select device that represents the Connectivity Server (A).

2. The connection can be initiated in two ways:
 - Left mouse click on the menu item “Connect using” → “Access Point” (B).
 - Right mouse click on the device that represents the Connectivity Server (A) and select “Connect using” → “Access Point”.



Figure 3-72. Initiate Connection

3. A “Connection Successful” message will be displayed.
4. See [Figure 3-73](#). A network connection between the devices has been established and the Connectivity Server has assigned an IP Address (A).

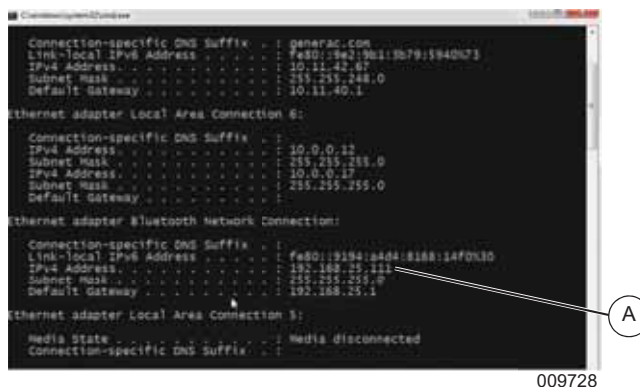


Figure 3-73. Assigned IP Address

5. Launch the web browser on the connected device and go to <http://192.168.25.1>. Allow 20-30 seconds for the Power Zone Application to load.
6. The Connectivity Server can now be accessed using the web browser on the connected device.

Change Connectivity Server Bluetooth Name

1. See [Figure 3-74](#). Select the text box field and enter a new name (A).
2. Select “Apply Changes” (B).

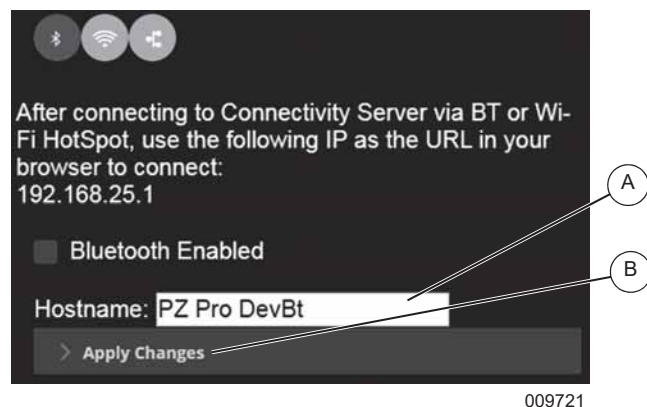


Figure 3-74. Change Bluetooth Name

3. Confirmation of name change is displayed.
4. See [Figure 3-75](#). New name is now displayed in name text box (A).



Figure 3-75. Updated Bluetooth Name

Unpair Bluetooth Device

Unpairing from the Connectivity Server will break the network connection between the two devices. After unpairing, the procedure in [Connect and View Power Zone App on Web Browser of Connected Device](#) must be performed once again to establish a network connection between the two devices.

1. See [Figure 3-76](#). Select connected Bluetooth device (A).
2. Select “Disconnect” (B).



009733

Figure 3-76. Disconnect from Paired Bluetooth Device



009735

Figure 3-77. Disconnect Bluetooth

3. A confirmation message will be displayed once disconnected.
4. The device will no longer be displayed in the list of “Paired Devices”.

Disconnect Network Connection to Connectivity Server

Performing a disconnect from the paired device will break the network connection between the two devices. The two devices remain paired, so the pairing process does not need to be performed to establish the network connection once again.

1. See [Figure 3-72](#). Locate and select device that represents the Connectivity Server (A).
2. To disconnect, either
 - Left mouse click on the menu item “Disconnect from device network” (B).
 - Right mouse click on the device that represents the Connectivity Server (A) and select “Disconnect from device network”.
3. The network connection to the Connectivity Server has been broken.
4. Follow steps in [Connect and View Power Zone App on Web Browser of Connected Device](#) in order to re-establish network connection to Connectivity Server.

Device Manager Setup

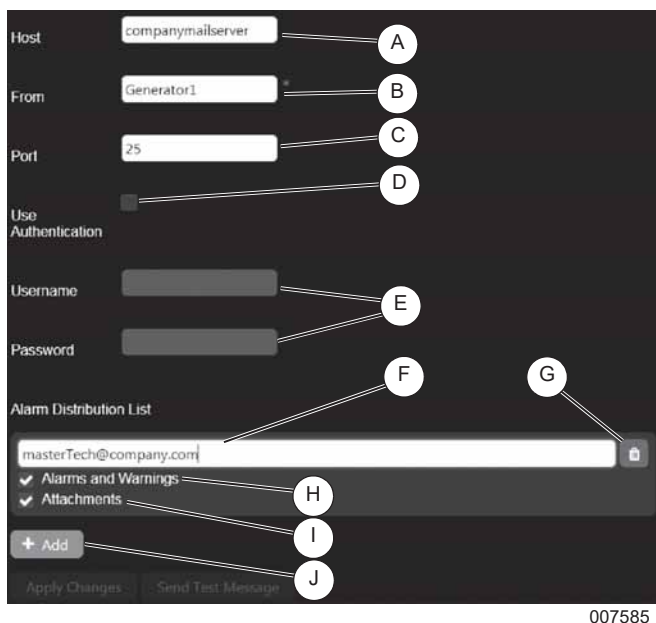
Device manager refers to two functions:

- Setting up the connections to Remote Annunciators and other equipment. These all connect to internal buses.
- Setting up modules connected to this generator Main Controller via CAN bus such as Power Zone AVR’s, Governors and Battery Chargers.

Email

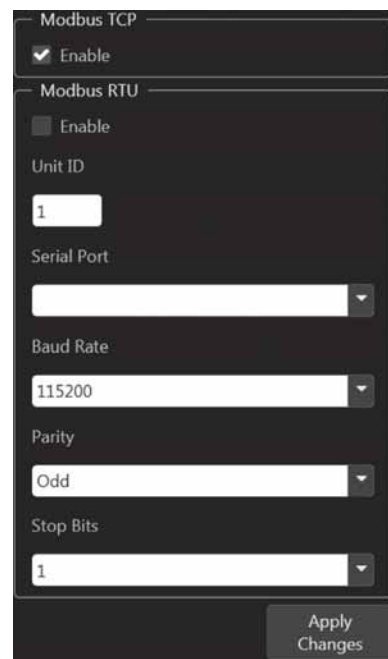
Power Zone features that use email must have access to an SMTP email server. See [Figure 3-78](#). This screen allows you to set up the email server and recipient list for alarm and warning emails. The name or IP address of the server providing SMTP services is entered in the Host field (A). The name 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. If your SMTP server requires a user ID and password to send emails, check the Use Authentication box (D) and enter the required user ID and password in the Username and Password fields (E).

The Alarm distribution list (F) 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 (H) 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 (I). Click the Add button (J) to save your changes.



007585

Figure 3-78. Email Screen



010392

Figure 3-79. Configure Modbus Pass-through

Configuring Modbus Pass-through

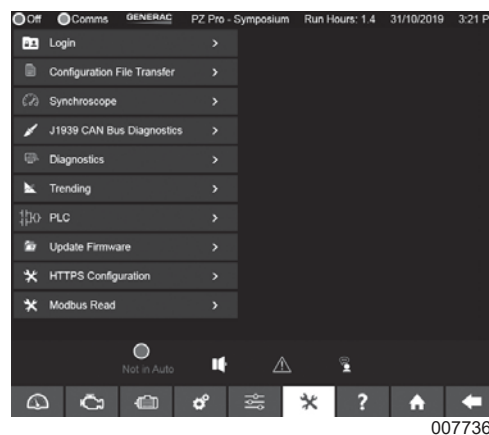
See [Figure 3-79](#). The Power Zone Connectivity Server acts as a gateway for external systems to exchange data with a Power Zone System using Modbus. The Connectivity Server supports both Modbus TCP and Modbus RTU over RS-485.

Check the Enable box under Modbus TCP to enable Modbus TCP access.

Check the Enable box under Modbus RTU to enable Modbus RTU access and configure the RS-485 port to match your external system’s communication settings. To configure the RS-485 port, set the slave ID of the Connectivity Server, select the RS-485 port from the Serial Port list and set the communication settings Baud Rate, Stop Bits and Parity.

Tools Menu

See [Figure 3-80](#). The Tools menu displays submenus for login, configuration file transfer, synchroscope, J1939 CAN bus diagnostics, diagnostics, trending, PLC manager, and update firmware.



007736

Figure 3-80. Tools Menu

Login Menu

See [Figure 3-81](#). 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.



Figure 3-81. Login Menu

Configuration File Transfer Screen

Power Zone generator configuration settings can be saved as XML files or read from an XML 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 3-82) reads the current settings from a Power Zone Main Controller and writes them to an XML file which can be saved to a mobile device through a browser or saved to a USB drive connected to the Connectivity Server:

1. Navigate to Tools → Configuration File Transfer → Read From Controller.
2. Select “Get Configuration” to create an XML 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”.

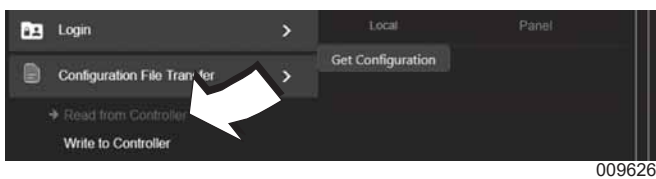


Figure 3-82. Read from Controller

The “Write to Controller” option (Figure 3-83) takes an existing configuration XML 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 Connectivity Server, select the “Panel” tab and select “List Configuration Files”. Select the file and select “Load”.

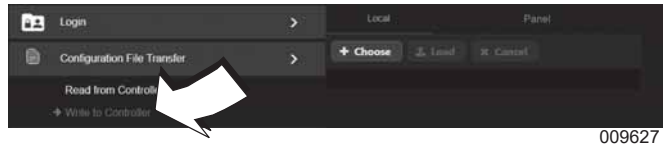


Figure 3-83. Write to Controller

J1939 CAN Bus Diagnostics

See Figure 3-84. The SPN (Suspect Parameter Number) Data screen displays all actively monitored SPN data. The SPN # column shows the SPN code and Name displays the text associated with that code. The value and unit columns display the value and the value’s units, respectively.



Figure 3-84. SPN Data Screen

See Figure 3-85. The SPN/FMI DTC (Suspect Parameter Number/Failure Mode Identifier Diagnostic Trouble Code) screen displays the system’s known SPN/FMI DTC incidents. It is broken into two sections: Active and Previously Active. Both sections display the numeric SPN/FMI codes followed by the text associated with the SPN and FMI.



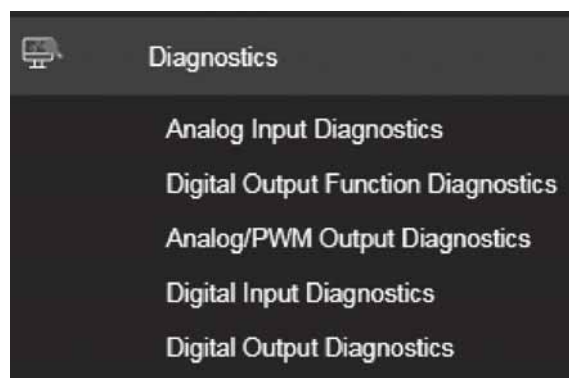
Figure 3-85. SPN/FMI Screen

See **Figure 3-86**. The Clear Active button (A) will send a request to clear the Active DTC. If the condition which caused the DTC to appear is still present, the Active DTC entry will remain in the Active box. If the condition is no longer present, it will move into the Previously Active box.

NOTE: Some DTCs will clear without the Clear Active button being pressed.

The Clear Previously Active button (B) will clear the contents of the Previously Active section.

NOTE: Some J1939 modules will not honor a request to clear the active or previously active lists or might require particular conditions to allow clearing to occur.



007588

Figure 3-88. Diagnostics

See **Figure 3-89**. Each of the diagnostic screens shows a dynamic reading of all the specific channels such as analog input channels and digital input channels.



010230

Figure 3-86. Clear Active/Previously Active Buttons

Synchroscope

See **Figure 3-87**. The Synchroscope screen allows the user to view the synchronization process between the generator and utility. A dynamic view of the delta phase angle, delta voltage and delta frequency between the generator and utility is shown. The outside circle rotates with the intent that when the gap is at the top, in line with the red line, the parameter is in sync (the delta is zero). The figures under the graphs show the scale of the graph. In the drawing above, the largest frequency delta displayed is ± 3 Hz. This is when the gap in the circle is at the bottom of the picture.

Channel	Function	Alternate Name	Status
1	USER CONFIG 01		LOW
2	USER CONFIG 02		HIGH
3	USER CONFIG 03		LOW
4	USER CONFIG 04	machine11	HIGH
5	USER CONFIG 05		LOW
6	USER CONFIG 06		HIGH
7	USER CONFIG 07		LOW
8	USER CONFIG 08		HIGH
9	USER CONFIG 09		LOW
10	USER CONFIG 10		HIGH
11	USER CONFIG 11		LOW
12	USER CONFIG 12		LOW
13	USER CONFIG 13		LOW
14	USER CONFIG 14		LOW
15	USER CONFIG 15		LOW
16	USER CONFIG 16		LOW
17	USER CONFIG 17		LOW
18	USER CONFIG 18		LOW
19	USER CONFIG 19		LOW
20	USER CONFIG 20		LOW
21	USER CONFIG 21		LOW
22	USER CONFIG 22		LOW
23	USER CONFIG 23		LOW

007589

Figure 3-89. Example Diagnostics Screen



007587

Figure 3-87. Synchroscope Screen

Diagnostics

The diagnostics screen shows a submenu with diagnostic types.

Trending

Power Zone has three ways to collect and analyze a series of values collected over a period of time: **Remote Trending**, **Local Trending** and **Data Logging**.

Remote Trending

See **Figure 3-90**. Remote Trending displays data in a graph as it is collected. Up to 16 values can be graphed at the same time. The values to be graphed are selected using the drop down lists on the left (A). The color of the drop down arrow indicates the color line that will be used to draw the graph. The minimum value to graph is

entered into the text box next to the drop down list (B). The text box on the far right is used to enter the maximum value to graph (C). The current value being read is displayed in the middle text box. The time interval between readings is selected using the Interval drop down list (D). The fastest data collection rate supported by Remote Trending is 250 ms. The grid lines behind the graph can be turned on or off using the Scale Illumination checkbox (E). To download a comma separated value file containing the collected data, press the Download button (F). A file named "TrendingLog.csv" will be downloaded to the Downloads folder on your PC.



007590

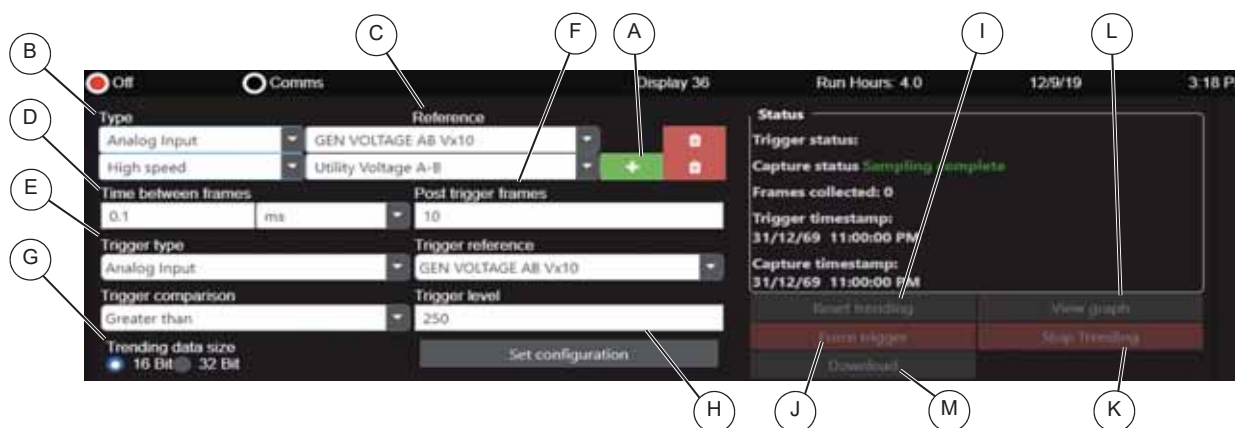
Figure 3-90. Remote Trending Screen

Local Trending

Local Trending can be used to collect data at timed intervals as small as 0.1 ms. The data cannot be graphed until the data collection has stopped. The total amount of collected data cannot exceed 8,192 bytes. If trending 16 Bit data, the maximum number of points is 4,096. If trending 32 Bit data, the maximum number of data points is 2,048. The maximum number of data frames trended is the maximum number of data points divided by the number of parameters. For example, 16 bit trending of 6 parameters results in a maximum of (4,096 / 6), or 682 frames.

See **Figure 3-91**. To configure and use local trending:

1. Select the data values to collect.
2. To add a data point, click the plus sign (A).
3. Select the data type using the Type drop down list (B). There are two types of data that can be collected: high speed data, which can be collected at intervals as short as 0.1 milliseconds, and function code data which are updated every two milliseconds.
4. Select the data value from the Reference drop down list (C).
5. Select the time interval between data points using the Time between frames drop down lists (D).
 - If a time interval of less than two milliseconds is selected and the data values include some data values that are function code types, data will be collected at your specified time interval but the data values that are function code types will only change every two milliseconds. High speed data consists of AC voltages/currents and a 100 us time stamp. Function code data consists of Analog I/O and Digital I/O values.
6. A trigger value (optional) is used to stop data collection when a specific condition is observed. To configure a trigger value select the data value that will cause the trigger, the comparison operation to use, and the level that will cause the trigger to occur (E).
7. Use the Post Trigger Frames dropdown list (F) to specify the number of data points that should be collected after the trigger occurs.
8. Use the Trending data size radio buttons (G) to select the number of bits to use for each data value (16 Bit or 32 Bit).
9. Select the Set Configuration button (H) to save the configuration to the Main Controller.
10. Select the Reset Trending button (I) to start collecting data using the new configuration or to restart data collection after it has stopped due to a trigger occurrence.
11. Select the Force Trigger button (J) to stop data collection after the post trigger data points have been collected.
12. Select the Stop Trending button (K) to stop data collection immediately without waiting to collect the post trigger data points.
13. Select the View Graph button (L) to display the selected data in a graph.
14. Select the Download button (M) to download the collected data in a Comma Separated Value (csv) file.



009617

Figure 3-91. Local Trending Screen

In the example above, two data values are being collected and stored as 16 bit values: Generator Voltage A to B and utility voltage A to B (**Figure 3-92**). Data points are collected every 0.1 milliseconds. Data collection is configured to stop when Generator Voltage A to B exceeds 2,500 (250V because the RMS voltages are multiplied by 10). Once the trigger value occurs, ten additional frames (data samples) will be

collected.

The results of this configuration are that 2,048 total data frames will be collected, each frame containing two values of 16 bits each. Ten of those data frames will be collected after the trigger, and 2,038 frames will be collected prior to the trigger.

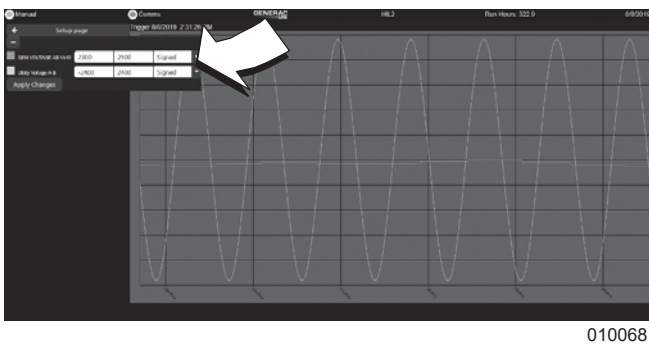


Figure 3-92. Local Trending Graph

Data Logging

Data logging provides a way to collect data from a generator over an extended period of time and retrieve it at a later time for analysis. The data logger records 152 commonly used data values and the date and time they were recorded and stores them in a comma separated value (csv) file. The file can be downloaded to a PC using a browser or can be sent as an attachment via email. A

data logging session can be configured and stored for later use.

1. See **Figure 3-93**. Select the New Logger button (A) to create a new logging session.
2. Select a data collection interval (B) to configure the logging session, set the duration of time for the data to be collected (C), and whether you want the data saved to the on-board storage of the Connectivity Server or to an external, USB connected storage device (D). Data logged to on-board storage is limited to 10MB of logged data.

NOTE: The configured data logging session can be saved for later use by pressing the Save button (F) or saved and started immediately by pressing the Save and Start button (G).

3. Once the data has been collected, it can be retrieved by downloading it through a browser by pressing the Download button (H) or have it sent as an attachment in an email by pressing the Email Log button (E).

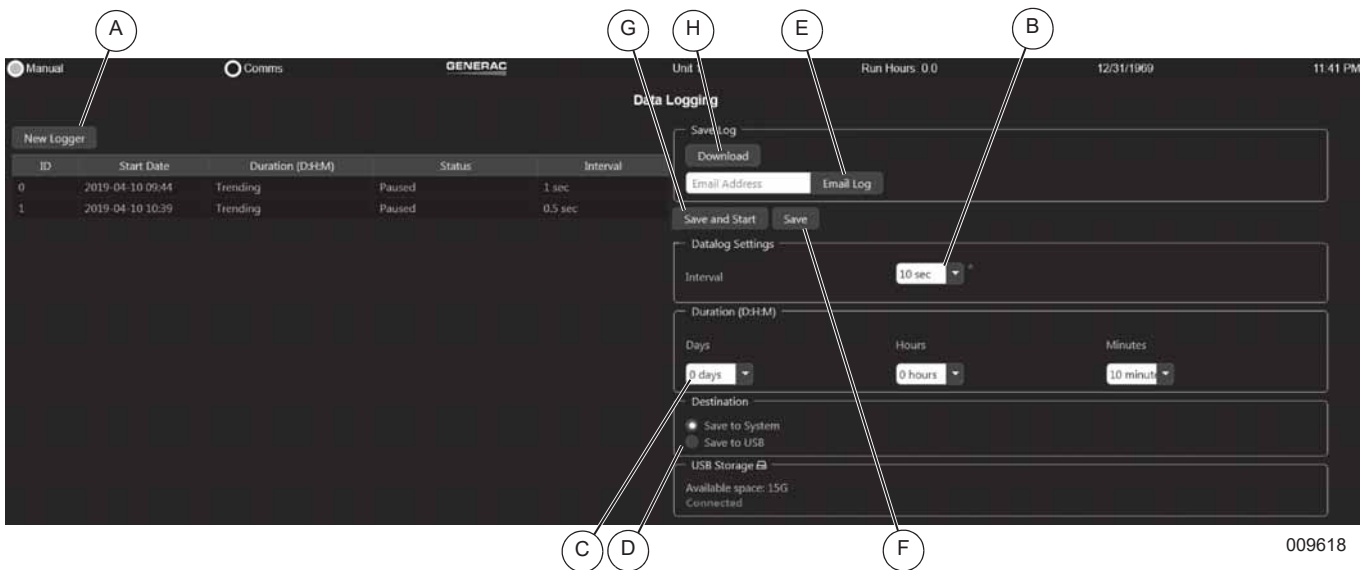


Figure 3-93. Data Logging Screen

PLC Manager

See **Figure 3-94**. The PLC Manager maintains the programmable ladder logic programs in the controller. The screen displays the current state of the eight PLC program slots. Each tab displays the name of the program if the slot contains a program and the running status of the program.

Upload a program from local computer:

1. Select one of the eight PLC slots (A) to expand.
2. Select “Load into panel” (B) to display the file uploader.

3. Select the “Local” tab (C) and select “Choose” (D) to display search navigation.
4. Select a file and select “Load” (E) in the file uploader.

Upload from USB drive:

1. Select one of the eight PLC slots (A) to expand.
2. Select “Load into panel” (B) to display the file uploader.
3. Select the “Display” tab (F) and select “List PLC files”.
4. Select a file and select “Load” (E) in file uploader.

The program will now run when the user enables the “Run” check box (G).

Selecting the “Save” button (H) displays two buttons for remote users. One is to save the program locally. The other is to save the program to a USB drive. Remove a program by expanding the PLC slot and selecting the red button with the trash icon.

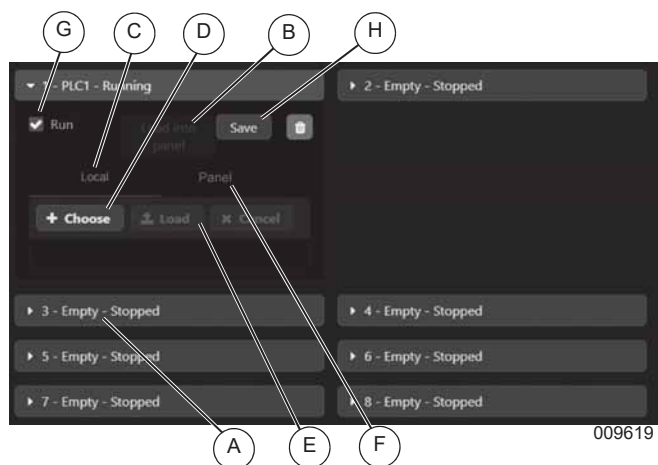


Figure 3-94. PLC Manager

Load the Power Zone Software Package

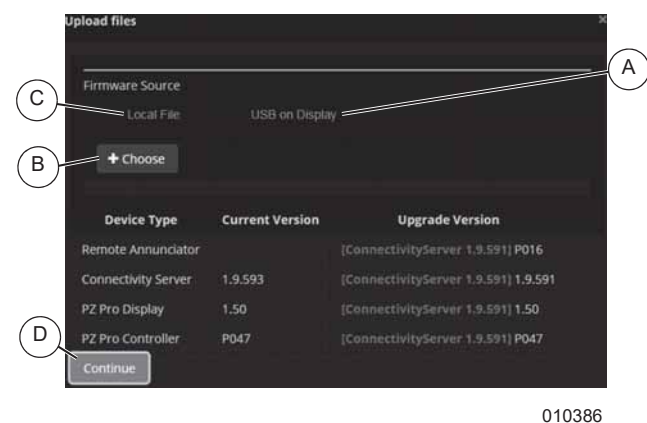
1. See [Figure 3-95](#). Select “USB on Display” tab (A).
2. Select “Choose” (B).
3. Select a package and select “Load” on the file uploader.

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 Connectivity Server. After the upload is successful, the Connectivity Server 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.



010386

Figure 3-95. Load Software Package

See [Figure 3-96](#). 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 Connectivity Server is updated, it will automatically reboot. During reboot the Connectivity Server 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 Connectivity Server app.



010389

Figure 3-96. Upgrade Progress

HTTPS Configuration Screen

See [Figure 3-97](#). The Connectivity Server 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 Connectivity Server 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.

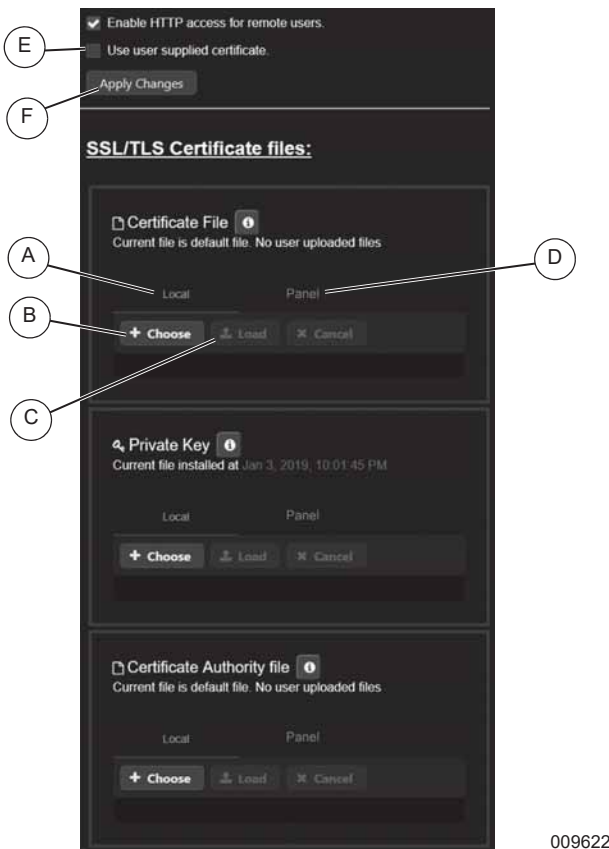


Figure 3-97. HTTPS Setup

Help

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



Figure 3-98. Help

About Screen

See [Figure 3-99](#). This screen displays information about the Power Zone system such as hardware and firmware versions, external storage and the current status of communication ports. The About screen also provides the ability to reboot the Connectivity Server.

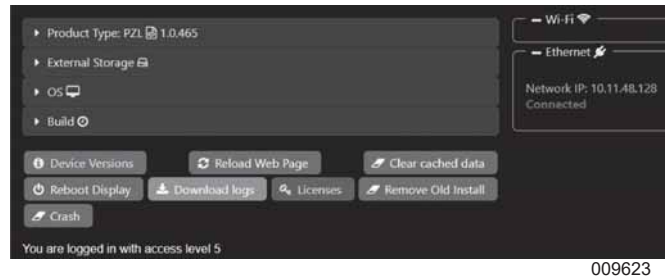


Figure 3-99. About Screen

Upload Documents Screen

See [Figure 3-100](#). 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 Connectivity Server. 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 Connectivity Server:

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).

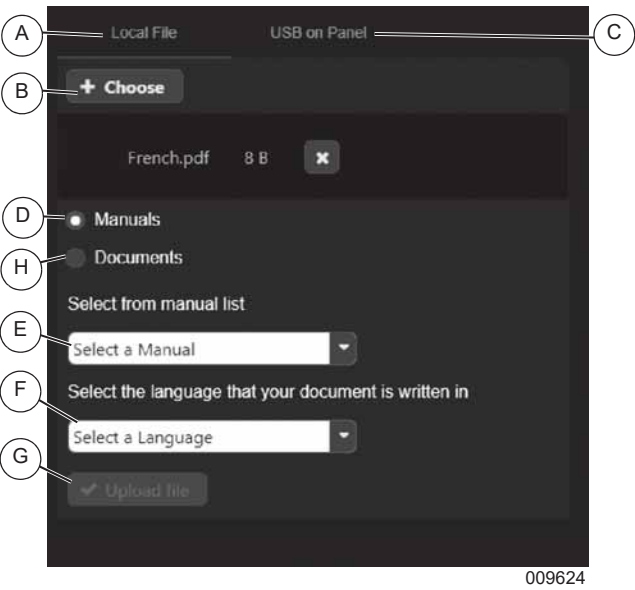


Figure 3-100. Upload Documents Screen



Figure 3-102. On-screen Keyboard

Login and Security

See [Figure 3-101](#). 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 3-102](#).

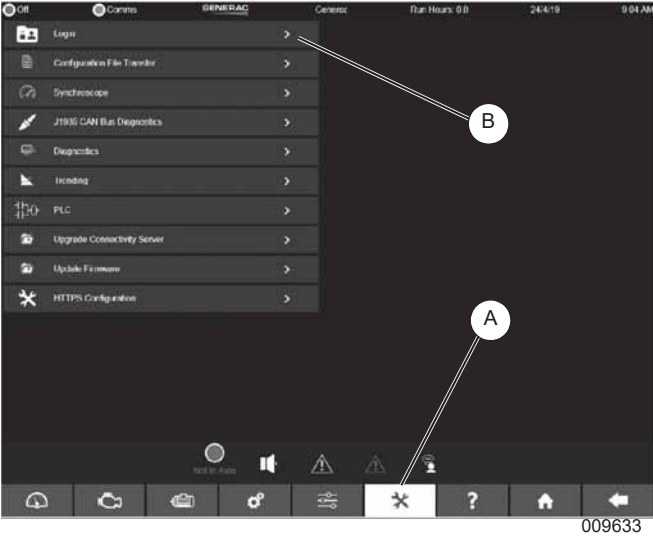


Figure 3-101. Login Menu

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Section 4 Troubleshooting

Troubleshooting Guide

Problem	Solution
Red LED in front of enclosure is OFF	Verify 12 V $\overline{---}$ 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 Pro Main Controller BS6 Connector.
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 Connectivity Server.

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