GENERAC®

Owner's Manual

Power Zone® Display
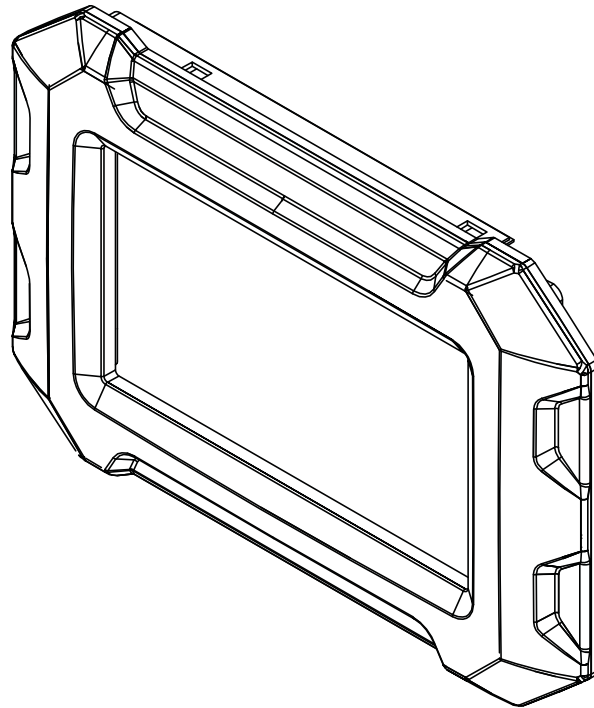
Table of Contents

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Section 1 Introduction and Safety

Introduction

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

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

Read This Manual Thoroughly

⚠WARNING

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

If any section of the manual is not understood, contact your nearest Independent Authorized Service Dealer (IASD), or contact Generac Customer Service at 1-888-GENERAC (1-888-436-3722), or **www.generac.com** with any questions or concerns. The owner is responsible for proper maintenance and safe use of the equipment.

Save these instructions for future reference. This manual contains important instructions for the automatic voltage regulator that should be followed during installation, operation and maintenance of the automatic voltage regulator. Always supply this manual to any individual that will use this device.

NOTE: Contact an IASD for manuals referred to within this manual.

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

Safety Messages

Throughout this publication and on tags and decals affixed to the unit, DANGER, WARNING, and CAUTION 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. Their 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.

Safety Rules

Study these safety rules carefully before installing, operating or servicing this equipment. Become familiar with this manual, the owner's manual and the unit. The equipment can operate safely, efficiently and reliably only if it is properly installed, operated and maintained. Many accidents are caused by failing to follow simple and fundamental rules or precautions.

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 the manufacturer does not specifically recommend, verify it is safe for others and does not render the equipment unsafe.

General Hazards

⚠ DANGER

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury.

(000190)

⚠ 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® Display (P/N: 10000007810) is the user interface for the Power Zone system. The Display can be used in applications other than generator control.

Symbol Definition

G with ~ symbol	AC Generator
~	AC Voltage
━ ━ ━	DC Voltage

Specifications

| Environmental Specifications	
Operating Temperature	-4 °F (-20 °C) to 140 °F (60 °C)
Humidity	5% to 90% non-condensing
Sealing	IP65 rated (front screen)
Enclosure	UL Type 1
Power Supply Requirements	
Power Supply Voltage	11 to 13 V⎓ (12 V⎓ nominal)
Power Supply Usage	24 Watts (maximum during power up)
Power Supply Cable	2 wires - Voltage drop across each conductor must be less than 1 V.
Display Screen	
Size	7" (diagonal)
Type	Color TFT
Resolution	800 x 480
Luminance	1,100 cd/m^2
Viewing Angle	12 O'clock
Backlight Life	40,000 hours
Touchscreen	4-wire resistive
Communication (Ethernet)	
Number of Ports	2 (Main Controller and external)
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	4.8 kbps to 57.6 kbps with selectable parity and stop bits
Maximum Number of Devices	32

Communication (USB)	
Number of Ports	2
Connector	Type A
USB version	USB 1.1/2.0
Maximum Cable Length	16.5 ft (5 m)
Baud Rate	12 Mbps, 480 Mbps
Communication (USB OTG)	
Number of Ports	1
Connector	Micro AB
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®)	
Number of Ports	1
Connector	RP-SMA Jack
Cable Type and Impedance	50 Ohms coaxial
Supported Antenna Type	2.4/5 Ghz Wi-Fi/Bluetooth
Wi-Fi	802.11 b/g/n (2.4 Ghz)
Bluetooth	4.1 Standard
Antenna (Wi-Fi and Bluetooth) - P/N 10000017312 or equivalent	
Type	Omni-directional puck antenna
Connector	RP-SMA plug
Cable Type and Impedance	RG174 coaxial, 50 Ohms
Cable Length (connected to antenna)	3.28 ft (1 m)
Frequency Band	2.4 Ghz, 5 Ghz
Gain	3 dBi (2.4 Ghz), 5 dBi (5 Ghz)
RF Coaxial Cable (required for enclosed generator, optional for open generator)	
Type	Low loss coaxial cable Connector RP-SMA Plug to RP-SMA Jack
Impedance	50 ohms
Cable Length	20 ft (6.1 m) Max
Frequency Band	Up to 6 Ghz
Attenuation	12.9dB/100 ft max at 2.4 Ghz, 20.4 dB/100 ft max at 5 Ghz
Bending Radius	0.75 in (0.019 m) max
Jacket Material	Polyethylene

NOTE: The Ethernet, RS-485, USB and Wi-Fi/Bluetooth 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.

NOTE: Although RS-485 hardware is implemented, there is currently no software implementation. This communication link is for future use.
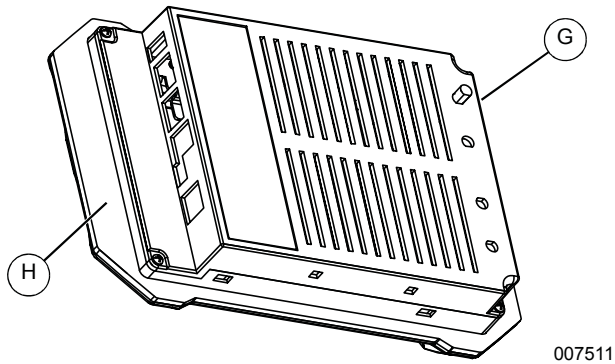
Component Locations
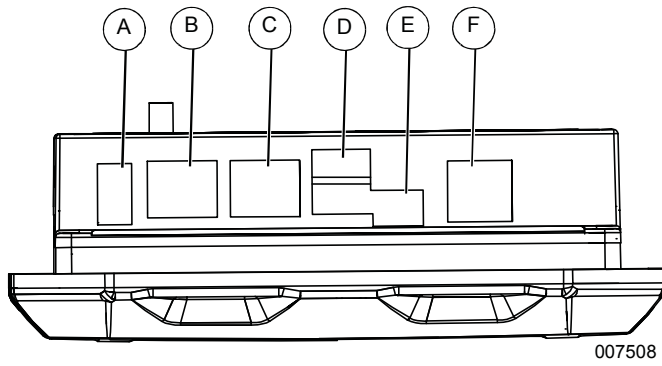
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A	Power
B	Ethernet - external
C	Ethernet - Main Controller
D	USB 1 (top) USB 2 (bottom)
E	USB 0
F	RS-485

Figure 2-1. Component Locations

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G	Wi-Fi antenna
H	Gasket

Figure 2-2. Wi-Fi Antenna

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Section 3 Installation and Operation
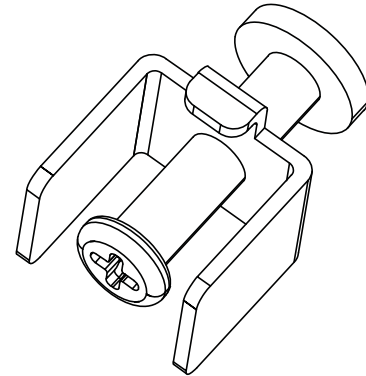
Installation and Mounting

⚠DANGER

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury.

(000190)

⚠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)

See *Figure 3-1*. For proper installation the sheet metal opening must be 200 x 140 mm with 25.4 mm keep-out zone for cabling purposes.
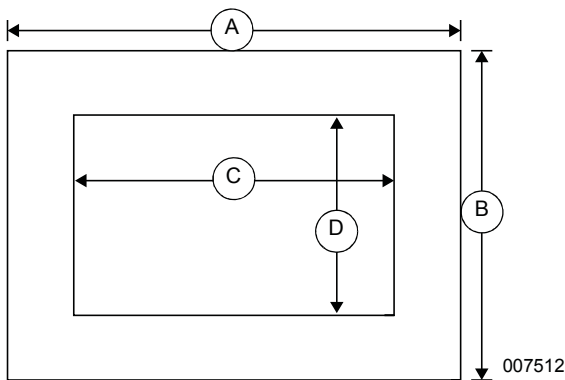

007512

A	250.8 mm
B	190.8 mm
C	200.0 mm
D	140.0 mm

Figure 3-1. Sheet Metal Opening

See *Figure 3-2*. Tighten all four fasteners (P/N: 0J6834) to 3 **in-lb** (0.3 Nm). DO NOT over-tighten.

IMPORTANT NOTE: Care should be taken when tightening fasteners. If excessive torque is applied, permanent damage may result. If not enough torque is applied to the fasteners, water may enter the panel and cause damage.

IMPORTANT NOTE: Verify there is at least 60 mm of space behind the controller for proper ventilation.

007513

Figure 3-2. Mounting Hardware

The gasket (*Figure 2-2*) and fasteners (*Figure 3-2*) help prevent water from getting into the module.

Cleaning

Do not use any cleaning solution to clean the Display enclosure or cover. Clean with damp cloth or sponge. Display contains electronics circuitry. Use extra caution not to drip water inside the Display when cleaning it around the vent and other holes. If water or other liquid enters the Display, disconnect power until the Display dries out completely. Special care should be taken when cleaning the touch screen. Dust off hard particles on the touch screen and use touch screen wipes to clean it.

Connection Details

Connector	Purpose	Description	Wire # (Default)
PWR-1	Provides power to the Display	12 V	15 A
PWR-2		Ground	0D
Ethernet - External	Connect to PC, BMS or other external device	RJ-45 Ethernet connector	
Ethernet - Main Controller	Connect to Power Zone Main Controller	RJ-45 Ethernet connector	E1
USB 2	Can be used for external add on USB devices or modules	Universal Serial Bus Type A connector	
USB 1			
USB 0	Test Purposes Only	Universal Serial Bus Micro AB On The Go (OTG) connector	
RS-485-1	Can be used to communicate via Modbus RTU (currently not implemented)	RS-485 Ground	
RS-485-2		RS-485 Ground	
RS-485-3		RS-485 +	
RS-485-4		RS-485 -	
WIFI ANT	Antenna connection	Wi-Fi/Bluetooth antenna connection	

Antenna Kit

An antenna (P/N 10000017312 or equivalent) is required for Wi-Fi or Bluetooth connectivity. A generator with an enclosure will require a coaxial cable (P/N 10000033441) between the antenna and Power Zone Display.

Home

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.

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Figure 3-3. Home

Screen Layout

See *Figure 3-4*. 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 page that can be accessed.

007514

Figure 3-4. Screen Layout

Keyboard Picker

See *Figure 3-5*. There is a floating icon on the display called a keyboard picker. The keyboard picker can be moved by sliding it with a finger. The keyboard picker opens a keyboard to enter text into an editable field. The keyboard is opened by tapping the icon (0= numeric, B= alphanumeric).

The keyboard picker is not displayed for remote users as they can use the native keyboard.
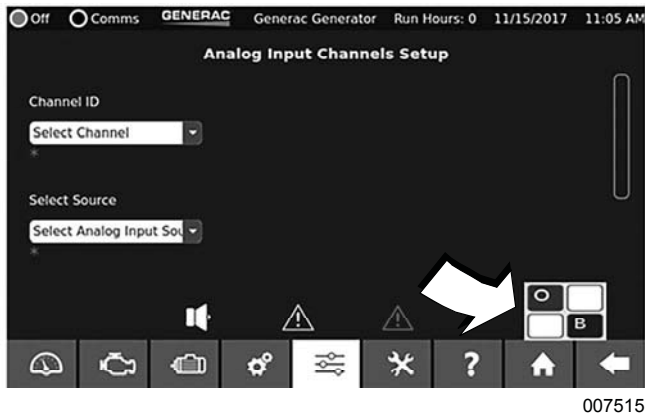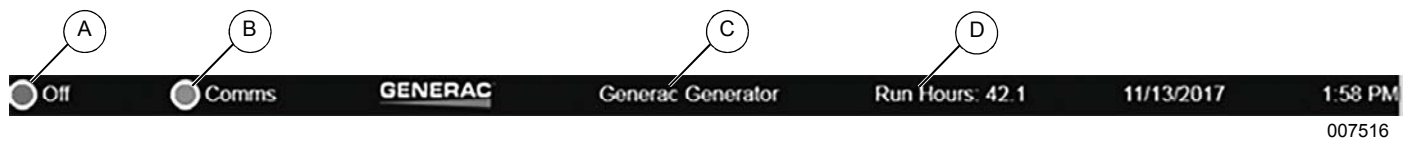
Figure 3-5. Keyboard Picker

Top Banner

Figure 3-6. Top Banner Features

(A) Keyswitch Status
A red LED indicates the unit is switched off. A green LED indicates the unit is in the automatic state. An orange LED indicates the unit has been started under manual control.

(B) Communications Health
A blinking green LED indicates there are no communications problems. A blinking red LED indicates a problem.

(C) Generator Name
Displays the name of the generator the display is attached to. The user can give the generator an easy to understand name such as "East", "West" or "Number 1". To name the generator, go to Setup-> Communications-> Power Manager page. Then, go to the Internal Network Information drop down and enter in the Friendly Name.

(D) Run Hours
Displays the total number of hours the engine has been run.

Bottom Banner

See *Figure 3-7*. All the displays and features of Power Zone are accessed via a nested menu system. Navigation is performed by touching 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. Holding a finger on the icon for a couple of seconds will display a "tool tip" above the icon describing its function. As a remote user using a PC to view and a mouse, hovering the mouse over the icon will have the same effect.

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Figure 3-7. Bottom Banner Features

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

– System Mimic (for MPS)

Engine

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

Alternator

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

System

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

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.

Tools

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

Help

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

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.

Back

This icon takes the user back to the last menu item.

Home Screen Bargraphs

See *Figure 3-8*. 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 calculated maximum, the bargraph is outlined in red.
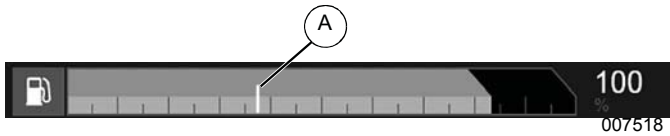

Figure 3-8. Bargraph

Alarm Ribbon

See *Figure 3-9*. 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 present. Pressing the icon that appears will display condition details.

	Alarm (Red)
	Warning (Yellow)
	Alarm Horn Active
	Alarm Horn Silenced
	Check Engine

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 3-9. Alarm Ribbon

Screen Features

Scrolling

For users with a touchscreen, swipe the screen in any direction to navigate.
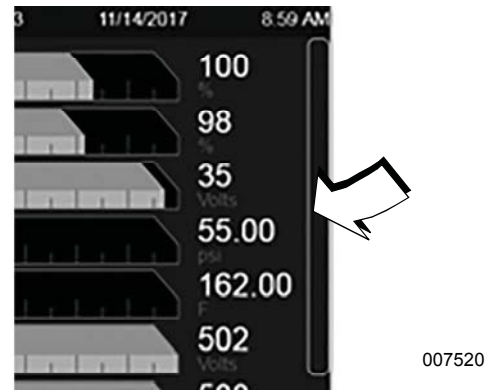See *Figure 3-10*. For remote users without access to the touchscreen, use a mouse to move the scroll bars.

Figure 3-10. Scroll Bar at Edge of Screen

Brightness

See *Figure 3-11*. Screen brightness can be adjusted from the display. The brightness is adjusted by a slider accessed from the tools menu.

NOTE: Screen brightness can only be adjusted from the display.

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*Figure 3-11. Screen Brightness Slider*

Clean Screen

The touchscreen can be deactivated for 30 seconds to allow the user to wipe the screen clean. This feature is accessible from the Tools menu (*Figure 3-7*).

Screen Calibration

If the touchscreen becomes inaccurate, then it will need recalibrating. This feature is accessible from the *Tools* menu.

Language

The screen is designed to be multi-lingual. Remote users can view the screen in a different language than what is displayed on the actual screen. To set the language, go to the *Setup* icon, choose "User" -> "Language/Locale". A selection box for languages will appear on the right hand side. Checking the "Save Settings" box will save the unit selection for the screen.
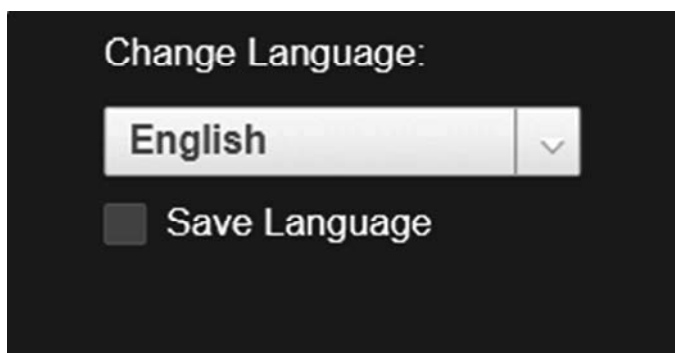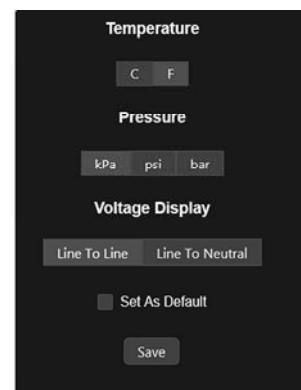

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Figure 3-12. Language Selection

Backlight

The backlight will automatically turn off after ten minutes of no activity. Touching the screen will turn the backlight on.

Units of Measure

See *Figure 3-13*. Remote users can view different units of measure than the actual Display. For example, the actual Display can be in Celsius but a remote user could view the data in Fahrenheit. To set the units of measure go to the *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 your selection to the built in display and all new remote users.

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Figure 3-13. Units of Measure

Time and Date

The system time and date can be set from the *Setup* icon. Navigate to Setup-> Calendar-> Date/Time.
Changing the date/time on any display 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.

Health Checkmark

See *Figure 3-14*. The checkmark indicates the system is healthy.

007524

Figure 3-14. System is Healthy (Green)

See *Figure 3-15*, *Figure 3-16* and *Figure 3-17*. When the generator has an alarm or warning status, the checkmark will change.

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Figure 3-15. Shutdown Alarm Condition (Red)

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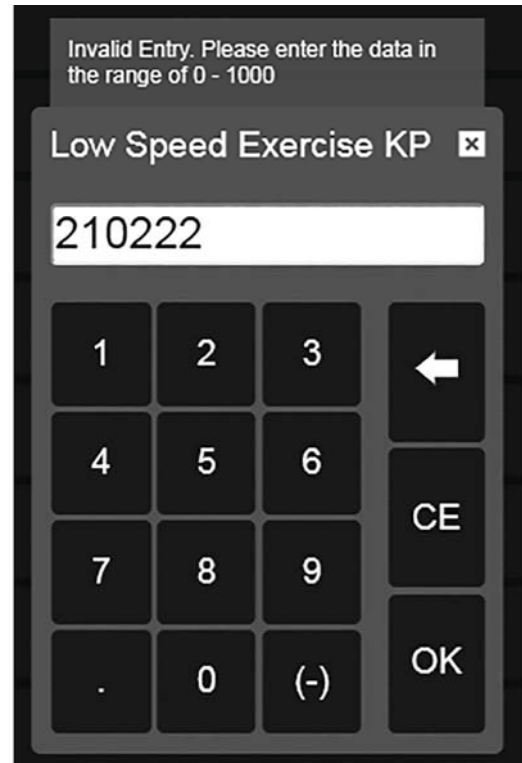*Figure 3-16. Non-Shutdown Alarm Condition (Red)*

007526

Figure 3-17. Warning Condition (Yellow)

Editing

Editing of configuration parameter values is performed by two methods: by entering a value (*Figure 3-18*) or selecting a value using the pull down selection box (*Figure 3-19*).

For text fields such as naming an analog channel, a keyboard can be opened on the screen using the *Keyboard Picker*. Remote users can use their native keyboard.

Invalid Entry. Please enter the data in the range of 0 - 1000

Low Speed Exercise KP ☒

210222

1	2	3	←
4	5	6	CE
7	8	9	
.	0	(-)	OK

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Figure 3-18. Numeric Value Editing (with ranges)

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Figure 3-19. 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

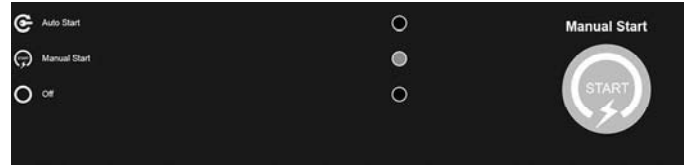See *Figure 3-20*. This screen displays bargraphs for the most common measurements.

007530

Figure 3-20. System Dashboard

ON/OFF Status

See *Figure 3-21*. This screen displays the status of the keyswitch (if equipped). If the generator can be controlled from the touchscreen, this screen provides the buttons to do so.

007531

Figure 3-21. ON/OFF Status

Maintenance Notes

See *Figure 3-22*. This screen displays an editable file of maintenance notes. Click on the "Add" button to add notes and click on the Submit button. The notes will appear below. "Routine Maintenance" has been added as shown in *Figure 3-22*. The notes can be edited or deleted by choosing the edit or delete small icons on the notes.
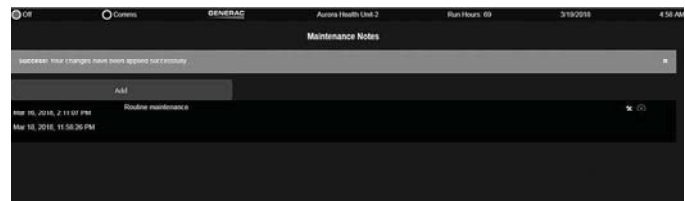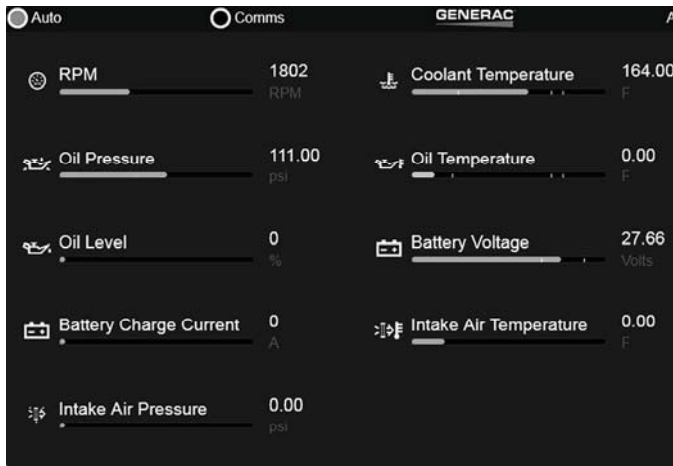

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Figure 3-22. Maintenance Notes

Engine Detail Screen

The Engine Screen displays bargraphs of measured engine parameters. In some cases the readings will be "empty" if the appropriate sensors are not fitted. The engine screen also provides a button to access the Engine Settings page. This page allows editing of engine related configuration parameters.

Figure 3-23. Engine Screen

Engine Settings

See *Figure 3-24*. The Engine Settings page displays an icon for each entry on the left side of the screen. Tapping (or clicking) on the text field will open the appropriate data entry keyboard. The new value is entered and saved. If the value is out of range a warning will display and prevent saving of data.


Figure 3-24. Engine Settings

Alternator Detail Screen

The Alternator Screen displays bargraphs of measured alternator parameters. In some cases the readings will be "empty" if the appropriate sensors are not fitted. The alternator screen also provides a button to access the Alternator Settings page. This page allows editing of alternator related configuration parameters.
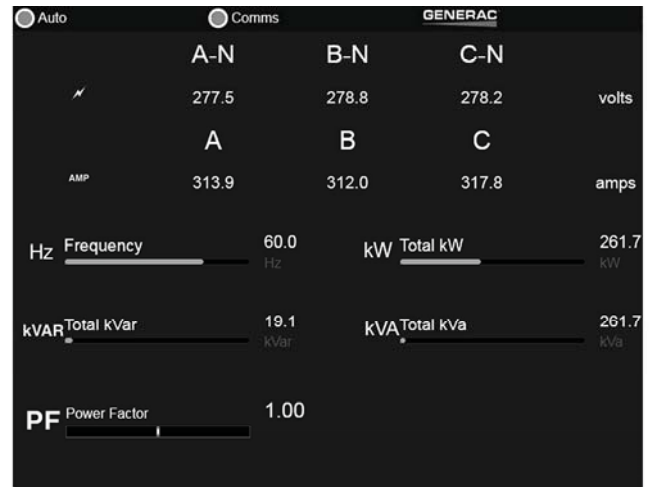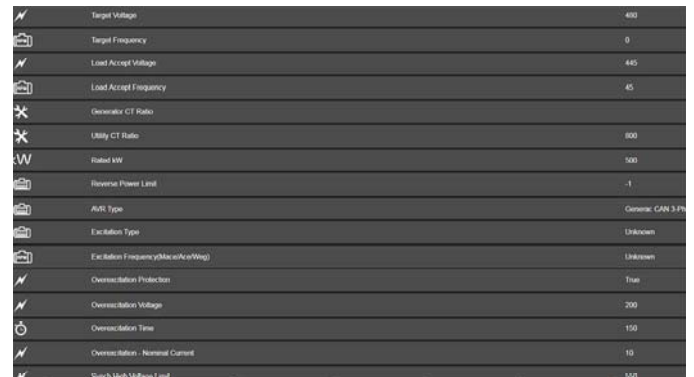

Figure 3-25. Alternator Detail Screen

Alternator Settings

See *Figure 3-26*. The Alternator Settings page displays an icon for each entry on the left side of the screen. Tapping (or clicking) on the text field on the right will open the appropriate data entry keyboard. The new value is entered and saved. If the value is out of range a warning will display and prevent saving of data. To see the range, delete the entry. The range will be display above the keyboard entry.
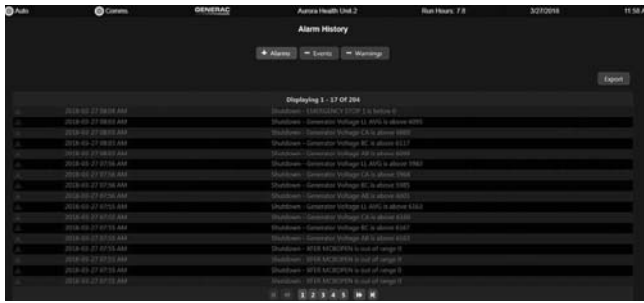

Figure 3-26. Alternator Settings

System Detail Screen

Alarm History

The Alarm History page shows a chronological list of alarms and warnings. Each alarm entry is time and date stamped and shows the source and value of the parameter at the time it occurred. The list can be filtered to show alarms only, warnings only, or both. Events from the event history can be added for cross reference in time (events can include customer defined events). The list is paginated and up to 1,000 alarms can be stored. The log can be exported to either a USB device or a list of multiple email recipients.
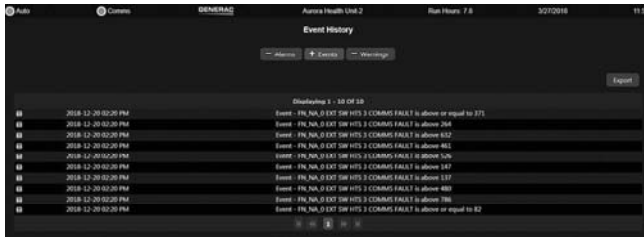
007734

Figure 3-27. Alarm History

Event History

The Event History page shows a chronological list of events including any customer defined events. Each event entry is time and date stamped and shows the source and value of the parameter at the time it occurred. The list can be filtered to be events only. Alarms and warnings from the alarm history can be added for cross reference in time. The list is paginated and up to 1,000 events can be stored. The log can be exported to either a USB device or a list of multiple email recipients.
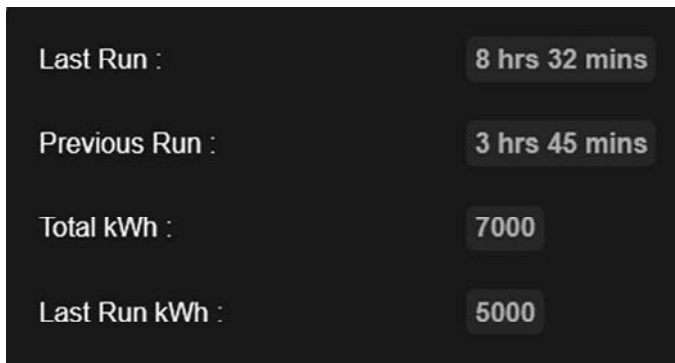

007735

Figure 3-28. Event History

Run Times

See *Figure 3-29*. The Run Times screen shows the generator operation history.

007536

Figure 3-29. Run Times

Maintenance Remaining

See *Figure 3-30*. 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 *Setup* -> Calendar page.
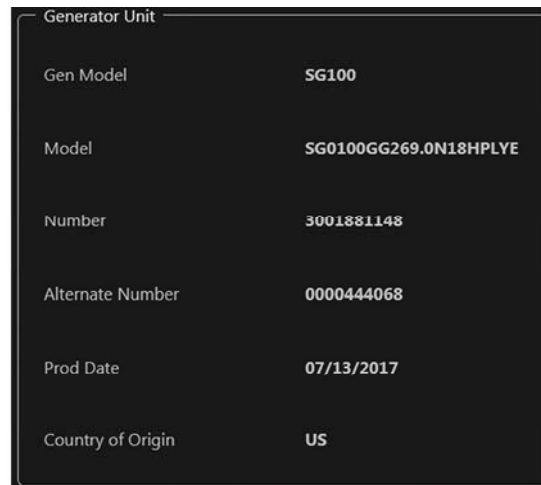

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Figure 3-30. Maintenance Remaining

Nameplate Data

See *Figure 3-31*. The Nameplate Data screen displays generator information such as Generator model, Production Date, Country of Origin, kW rating and voltage.

007538

Figure 3-31. Nameplate Data

Dealer Information

See *Figure 3-32*. The Dealer Information screen is an editable text field where dealer contact information is stored.

007539

Figure 3-32. 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 on the "Add" button to add notes and click on the Submit button. The notes will appear below. The notes can be edited or deleted by choosing the "Edit" or "Delete" icons on the notes.

Bus/Utility

See *Figure 3-33*. The Bus/Utility screen displays bargraphs showing measured values for the system powerbus. For example, in a two generator system the values are for the common power bus between the generators. Bus/Utility power and current measurements are only valid if associated CT's are fitted.

007540

Figure 3-33. Bus/Utility

Setup Screen

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 3-34*. The System Setup screen is used to enter global settings about the generator.

007541

Figure 3-34. System Setup

Wiring type indicates single or three-phase generator wiring.

Switch type defines the type of generator output switch attached to the generator (normally used for paralleling to the bus or Utility (grid) Options are:

- Contactor
- Motorized Breaker

MPS setting is the number of generators in the system.

Air/Fuel Setup

See *Figure 3-35*. The Air/Fuel Setup screen is programmed at the factory to calibrate emissions and should not be adjusted.

007542

Figure 3-35. Air/Fuel Setup

Automatic Voltage Regulator (AVR)/Governor Bias Setup

See *Figure 3-36*. The AVR/Governor Bias Input screen is used to setup a scheme where a Power Zone system's AVR and Governor can be externally biased by third party equipment. This can be used by Switchgear to control synchronization and power sharing/exporting.
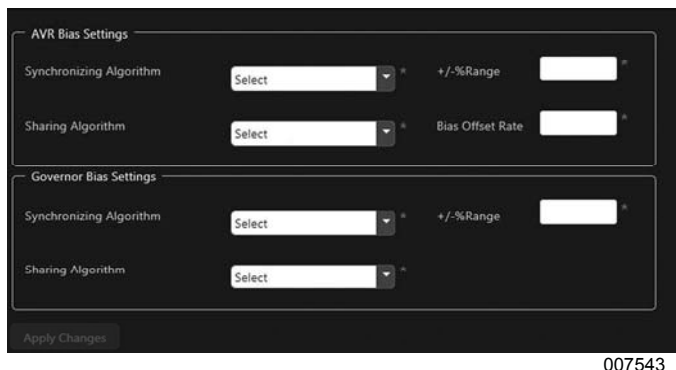

007543

Figure 3-36. AVR/GOV Setup

AVR Bias Settings: Synchronizing Algorithm

This is the algorithm used when the generator is synchronizing to another power source. There is currently only one option:

– "Voltage Bias" indicates the analog input value will be interpreted as a percentage offset to the system target voltage. This allows the output voltage to be biased up or down by a percentage with a 0.1% resolution.

AVR Bias Settings: Sharing Algorithm

This is the algorithm used when the generator is paralleled with another power source and is sharing kVARs. There is currently only one option:

– "Voltage Bias" indicates the analog input value will be interpreted as a percentage offset to the system target voltage. This allows the output voltage to be biased up or down by a percentage with a 0.1% resolution. The result will be a change in the direction and/or amplitude of kVAR and therefore a change in the Power Zone generator's PF.

AVR Bias Settings: +/- % Range

This parameter is the maximum percentage range the bias signal allows the system target voltage to be changed.

AVR Bias Settings: Bias Offset Rate

This is to compensate for an external control system that can only use ± bias signal voltages and always returns to 0V when controlling starts. If this value is 0, this special compensation is disabled. Otherwise, it is the number of 20 ms loops (50 is 1 second) between each 0.1%

decrement of the bias offset.

Governor Bias Settings: Synchronizing Algorithm

This is the algorithm used when the generator is synchronizing to another power source. There is currently only one option:

– "Speed Bias" indicates the analog input value will be interpreted as a percentage offset to the system target frequency. This allows the output frequency to be biased up or down by a percentage with a 0.1% resolution.

Governor Bias Settings: Sharing Algorithm

This is the algorithm used when the generator is paralleled with another power source and is sharing kW. There is currently only one option:

– "Speed Bias" indicates the analog input value will be interpreted as a percentage offset to the system target frequency. This allows the output frequency to be biased up or down by a percentage with a 0.1% resolution. The result will be a change in the direction and/or amplitude of kW.

Governor Bias Settings: +/- % Range

The Governor speed bias signal analog input channel is interpreted by the firmware as a percentage of the system target frequency. This parameter is the valid percentage range for the bias signal. The analog input channel value will be limited to this selected range. This range can be ±3.0% to ±15.0% with a 0.1% resolution.

Calibrations (Voltage and Current)

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.
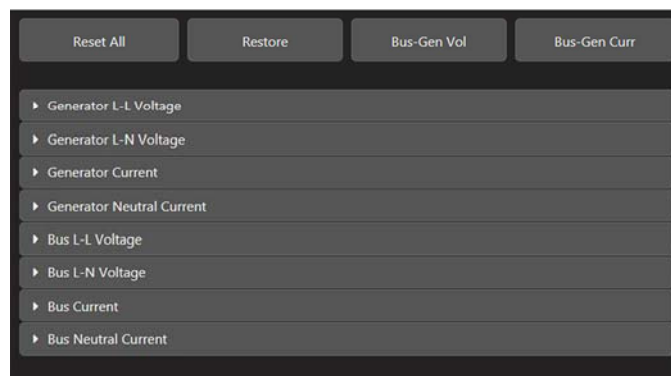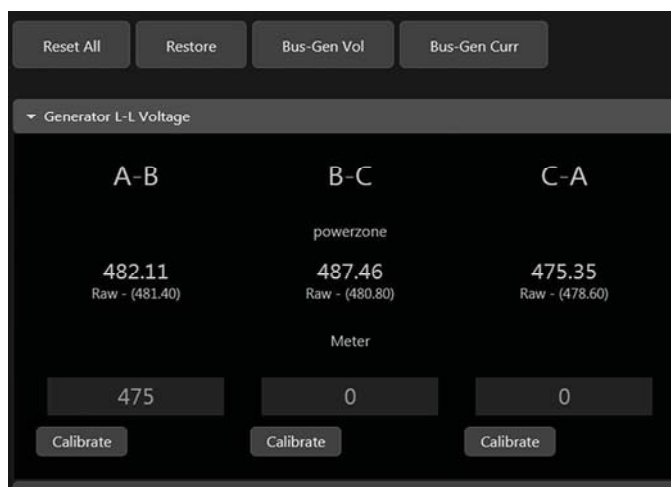

007545

Figure 3-37. Calibrations

There are 4 general buttons:

- The Reset All button resets all calibrations to one (no calibration).
- The Restore button sets all calibrations back to the settings saved when this screen was opened.

- The Bus-Gen Volts button will automatically calibrate the bus voltage readings to be the same as the generator voltage readings in an MPS or Utility paralleling system. The generator voltages must first be calibrated. The bus voltages can still be manually calibrated if desired.
- The Bus-Gen Current button will automatically calibrate the bus current readings to be the same as the generator current readings in an MPS or Utility paralleling system. The bus currents 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 3-38* and follow the procedure below.

007546

Figure 3-38. Calibration Example

1. Select Generator L-L button.
2. Start in the A-B voltage column. The Power Zone A-B voltage reading is dynamically displayed on the screen.
3. Use the meter to read the A-B voltage manually.
4. Enter the reading onto the screen.
5. Click the green Calibrate button. 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.

Protections (Alarms, Event History, GFI, I^{2}T)

See *Figure 3-39*. 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 I^{2}T (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 *Setup* -> Analog I/O and Setup -> Digital I/O for details on this process.
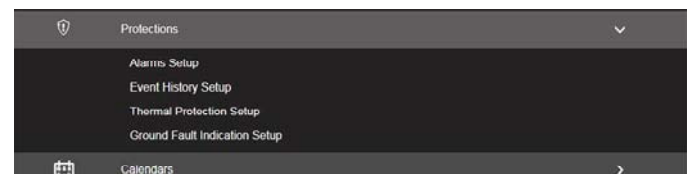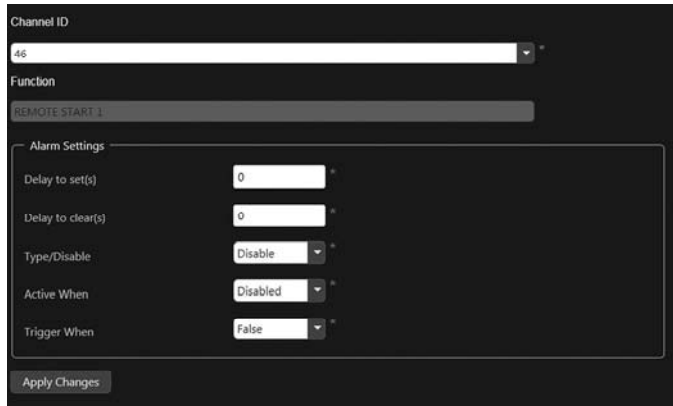

007547

Figure 3-39. 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. Tapping Alarms Setup will allow you to select from *Digital Input Alarms*, *Digital Output Function Alarms* or *Analog Input Alarms*.

Digital Input Alarms

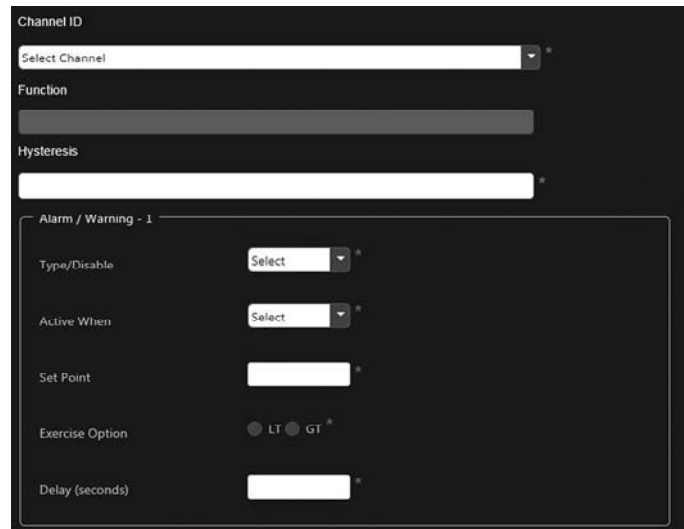See *Figure 3-40*. Follow the procedure below to setup Digital Input Alarms.

1. Select the channel number to set an alarm on. The function of the channel will be displayed in the function box.
2. Enter a delay to set time. This is the amount of time the alarm condition must be active before the alarm is set.
3. Enter a delay to clear time. This is the amount of time the alarm condition must be inactive before the alarm is cleared.
4. Enter the type of alarm (Alarm, Shutdown Alarm, Warning).

5. Choose when the alarm becomes active (Always, Only when Running, or after a Hold Off delay (hold off means a delay after the engine has started)).

6. Set the trigger level as True or False and save.

007548

Figure 3-40. 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 the range. Follow the procedure below to set an alarm or warning.

1. See *Figure 3-41*. Select the channel number to set an alarm on. The function of the channel will be displayed in the function box.

2. Enter a hysteresis value if required in 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 1,832 °F (1,000 °C) and a hysteresis of 212 °F (100 °C), then the temperature must drop below 1,652 °F (900 °C) before the warning clears and can be set again.

3. Enter the alarm type (Alarm, Shutdown Alarm, Warning)

4. Choose when the alarm becomes active (Always, Immediate, or after a Hold Off delay (hold off means a delay after the engine has started)).

5. Enter the setpoint value in the chosen units of measure.

6. Check either greater than (GT), or less than (LT)

7. Enter a delay time. This is the amount of time the alarm condition must be active before it is set.

8. Save the setting.

007549

Figure 3-41. Analog Input Alarms

Event History Setup

See *Figure 3-42*. 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.

NOTE: Alarms and Warnings can be configured to transmit an email to a list of recipients.
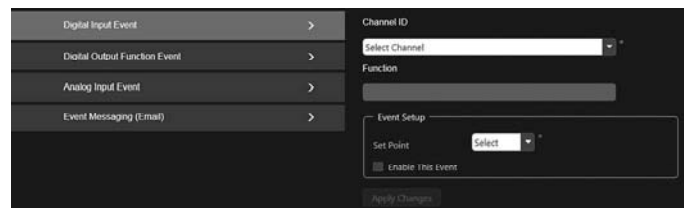
007550

Figure 3-42. Event History Setup

Thermal Protection Setup (I^2T)
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. This feature is disabled in the firmware when the unit is paralleled to another generator.

I^2T 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.

Examples:

- 3 x rated current for 10 seconds is 3^2 x 10 = 90

- 1.1 x rated current for 74 seconds is 1.1^2 x 74 = 90

007551

Figure 3-43. Thermal Protection Setup

Ground Fault Indication (GFI)

The GFI looks for over-current on the neutral return path. The neutral return path is sensed by the neutral current analog Input. GFI's neutral current threshold can be setup. Fault Delay is the time after Neutral Current Threshold has been exceeded and before GFI trips. Neutral Current Hysteresis is the amount margin on the Neutral Current Threshold.
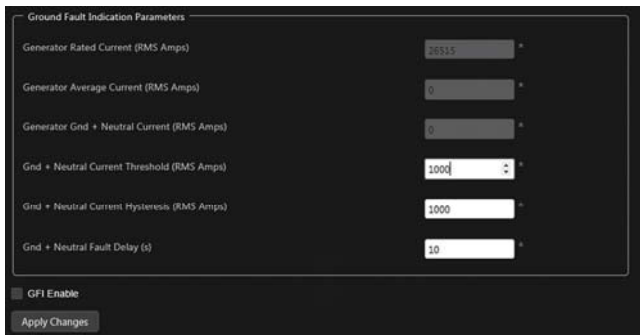
007845

Figure 3-44. Ground Fault Indication (GFI)

Tools Screen

The tools screen provides access to various submenus.

007736

Figure 3-45. Tools Screen

Update Firmware

The display is designed to be the hub from which all the system firmware can be updated. This includes the firmware in the display, the firmware in the Main Controller, and the firmware in the other Power Zone modules such as the Battery Charger and AVR. Firmware can be updated from local USB storage, a remote PC or tablet.

1. Verify all generators connected to the Ethernet being used to update firmware are not running.

2. Select the device you wish to update from the displayed list.

3. Select the storage location for the file: local USB or guest storage for a remote update.

4. Select the file name.

5. Select "Push File".

007591

Figure 3-46. Update Firmware
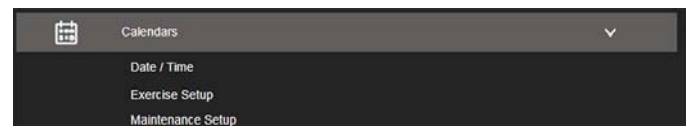
Help

This screen provides access to the Owner's Manual.

007632

Figure 3-47. Help

Calendars

See *Figure 3-48*. The Calendars screen displays time and date related functions.

007552

Figure 3-48. Calendars

Set Time and Date

This is covered in *Time and Date*.

Exercise Setup

This screen is used to setup Parallel, In-Series and Single generator exercise. The command calendar can be used to set up a multiple generator exercise command. Select how often the exercise should run (weekly or bi-weekly) 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 3-49. Exercise Setup

Maintenance Setup

See **Figure 3-50**. 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.
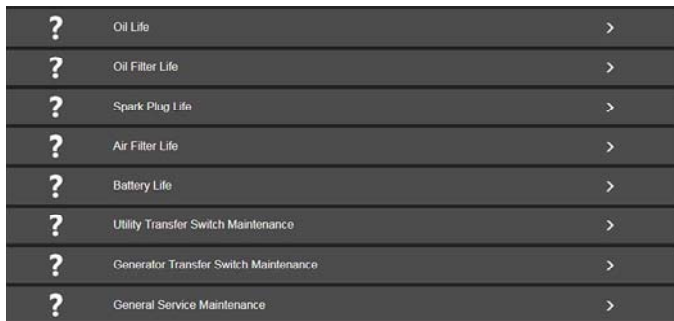

007553

Figure 3-50. Maintenance Setup

See **Figure 3-51**. Since maintenance intervals can depend on several factors, the user can select up to three cycle types. 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.
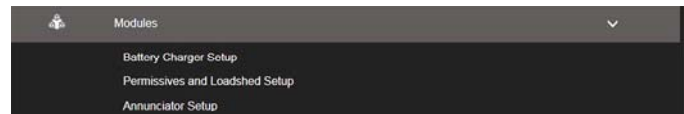

007554

Figure 3-51. Oil Life Maintenance Setup

Modules

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.

007555

Figure 3-52. Modules

Permissive and Loadshed

The Permissive and Loadshed module has its own setup page. For details on how the Permissive and Loadshed module operates, consult the Permissive and Loadshed manual. A Permissive and Loadshed module is only fitted in an MPS configuration and is used to prevent generator overload in case not all generators are usable. Communications with the Permissive and Loadshed module are set up on the Communication Setup page.

Setup of the Permissive and Loadshed module depends on the load configuration of the transfer switches (see Permissive and Loadshed manual). Once the permissive signals, loadshed signals and the generator connected to the power bus signals have been wired with the help of the manual, enter the appropriate values into the fields shown and save the settings.

007557

Pin	The IO pin this generator is connected to.
Friendly Name	The User Given Name for this Generator.
Default Load	This column is populated from this Generator's broadcast data.
Assigned Load	User can enter a value of load to override the Default Load of this Generator.
Override	This field checked indicates to override the Default Load with the Assigned Load for this Generator.

Figure 3-53. Pin Table

007558

Figure 3-54. Permissive and Loadshed

Remote Annunciator Setup

The Remote Annunciator module has its own setup screen which allows the user to define the functions of the optional relays inside the annunciator, the spare light and the System Annunciator selection. Setup does not affect the function of the LEDs. Communications with the annunciator are set up on the Communication Setup page.

007559

Figure 3-55. Remote Annunciator Setup

There can be more than one annunciator 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 Communications Setup screen, select the annunciator from the first drop down box RAP Friendly Name. Any annunciator can be associated with any generator. Select the name of the generator from the second drop down box, Generator Friendly Name. If the annunciator is going to be a System Annunciator check the System Annunciator box.

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 buttons for each relay. Repeat for all relays as needed and save the settings.

Digital I/O

See *Figure 3-56*. 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.
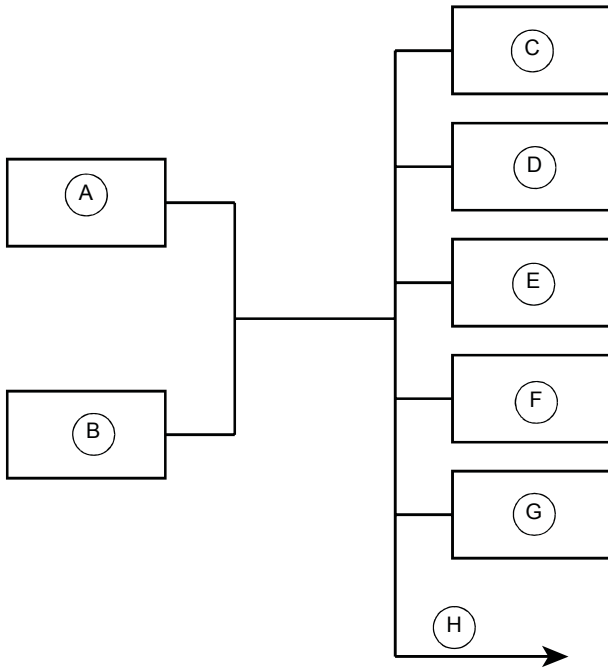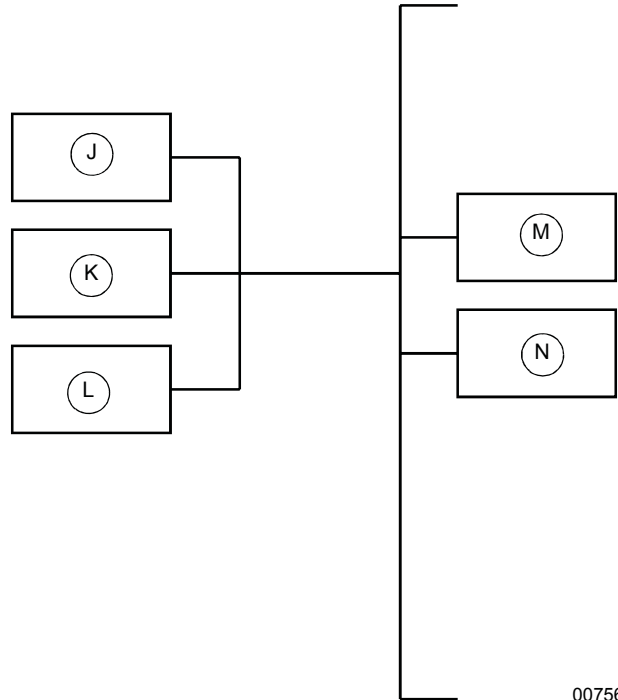
Figure 3-56. Digital Input Mapping

A	Physical GPDI channels
B	Internal digital signals
C	Alarm
D	Event
E	Trending
F	Diagnostic
G	Display
H	To digital output sheet

See *Figure 3-57*. 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 Physical Source to operate that digital output. A Physical Source can be a digital input, a needed program 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 27 outputs on the Main Controller.
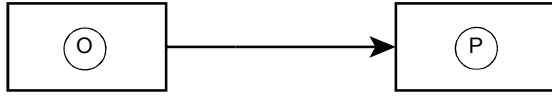

Figure 3-57. Digital Output Mapping

J	Physical source
K	Allocated DOFs
L	Control source
M	Digital output pin
N	Diagnostic

See *Figure 3-58*. 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.

To use a DOF to operate an output:

1. Setup the DOF pick list on the: *System* -> Digital I/O -> Digital Output Function List Setup page.

2. Assign a channel number to the DOF, so the rest of the system can reference it: System-> Digital I/O-> Digital Output Functions Setup page.

3. The Digital Output Mapping page shows a simple summary view of how all the output channels are mapped.
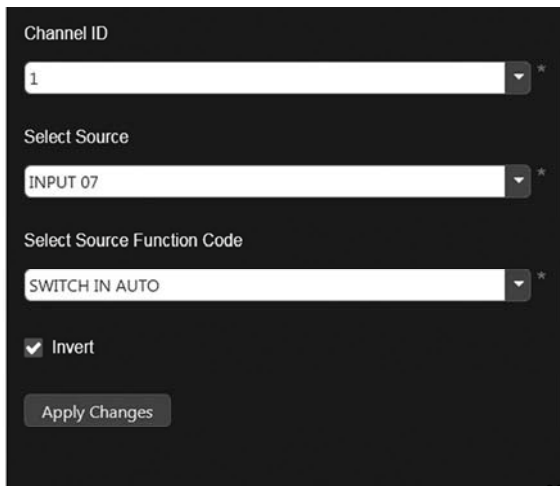
007562

Figure 3-58. DOF Mapping

| O	Available output functions
P	Allocated DOFs (0-208 long)

Digital Input (DI) Setup

1. See *Figure 3-59*. Select a channel number (arbitrary)
2. Select the input
3. Select the required function code
4. Check the invert box if you want to change the digital polarity
5. Apply the changes

007563

Figure 3-59. DI Setup

Digital Output Function (DOF) List Setup

System-> Digital I/O-> Digital Output List Setup page
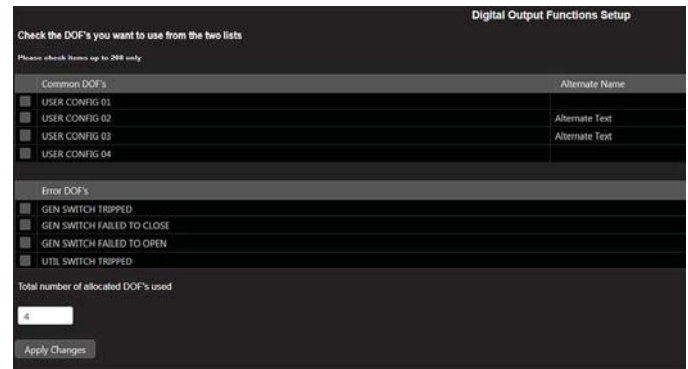
007564

Figure 3-60. DOF List Setup

1. Select up to 208 DOFs to use from the two lists by checking the boxes. Add an Alternate name to any user configurable DOFs, if required, via the Digital Output Functions Setup page.
2. Apply the changes.
3. Assign channel numbers to the picked DOFs so they can be referenced from the rest of the configuration system: System-> Digital I/O-> Digital Output Functions Setup page.
4. See *Figure 3-61*. Select an unused channel number.
5. Assign the DOF to it.
6. Apply the changes.

007565

Figure 3-61. DOF List Setup

Digital Output (DO) Setup

1. See *Figure 3-62*. Select the channel number. The channel number is the same as the output.
2. Select the type of source (a pick list will be displayed).
3. Select the required source function code.
4. Enable the output.

---

5. Invert the digital polarity if desired.

6. Apply the changes.

NOTE: The "View Output Channel Assignments" button does not currently work. This can be viewed from the Digital I/O mapping button.
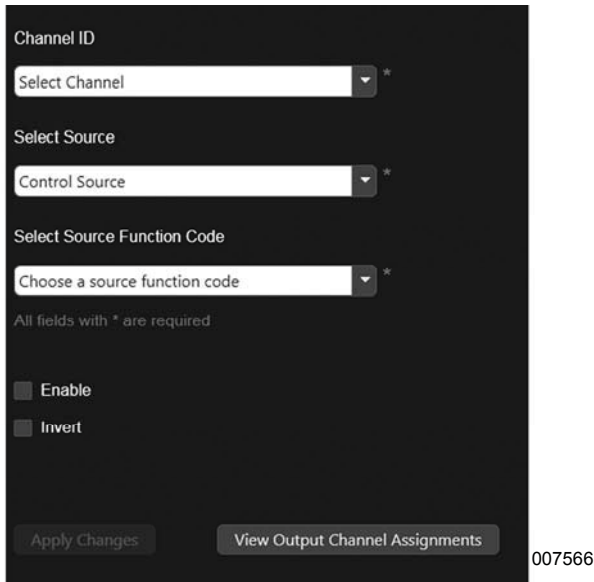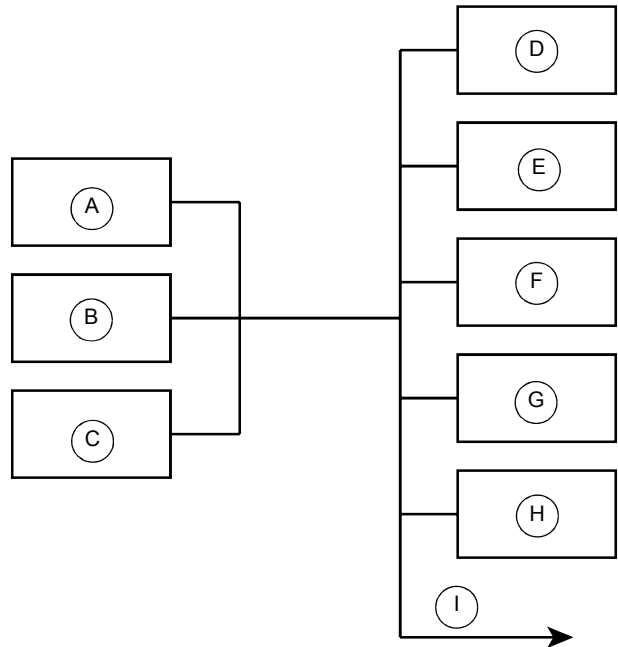

Figure 3-62. DO Setup

Analog I/O

Analog I/O is based on the same 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), 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.

Real analog inputs (inputs that have a real 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 cater to each of these inputs.

Analog inputs from multiple sensors need to be converted to known units. This can be performed via a built in equation, a translation table or translation with calibration. Generac has a tool to convert a sensor

datasheet into a custom translation table, if required. There are fields to enter calibration constants for higher accuracy for a calibrated table or equation. For the equations, there are fields to enter the coefficients.

Figure 3-63. Analog Input Mapping

A	Physical channels
B	Derived channels
C	CAN channels
D	Alarm
E	Event
F	Trending
G	Diagnostic
H	Display
I	To analog output sheet

Analog Inputs (AIN) Setup

1. Select the channel number.

2. Select the source (a pick list will be displayed of real, derived or CAN bus inputs).

3. Select the required source function code that matches the source. In the example in *Figure 3-64* a user configurable function has been named "Tropical beach temperature". This is the name displayed in place of "USER CONFIG 02".

Figure 3-64. Analog Inputs (AIN) Setup

Figure 3-65. Analog Inputs (AIN) Setup

4. Select the sensor type (see sensor datasheet if unknown).

5. Select a pull up resistor only if the sensor is resistive. 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. Apply filtering to the reading if necessary. The larger the number entered, the slower the response will be.

7. See *Figure 3-65*. Choose the way the reading is translated (raw, polynomial or table).

8. If the reading is to be calibrated, enter the scaling factor (M) and the offset (B).

9. If the translation is by polynomial, enter the coefficients.

10. Enable the channel. If you are not using the channel, do NOT enable it as it slows down the processing time.

11. Apply the changes.

Analog Output (AO) Setup

Analog outputs can be straight forward voltage outputs, or they can be PWM type outputs with a 0 to 100% duty cycle. They usually come preprogrammed from the factory. An analog output is wired to a real physical pin, either PWM or 10 bit analog. The source for an analog output can be mapped from several places including mapping an analog input to an output (see "Analog Output Mapping" diagram below).
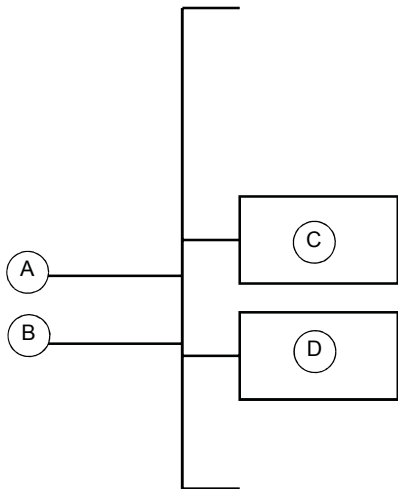

007570

Figure 3-66. Analog Output Mapping

| A	From analog input mapping sheet
B	Control source
C	Analog/PWM output pin
D	Diagnostic

The analog output pages display differently depending on the type of output selected (Analog vs PWM). *Figure 3-67* shows an example of analog output sourced from a derived input.

007571

Figure 3-67. Analog Output (AO) Mapping

1. Select channel number. The channel number is the same as the pin where channels 1-4 are analog and 5-11 are PWM pins. The type selected is displayed on the screen automatically.
2. Select the source type as analog or control. A different pick list will be displayed for each.
3. Select the function code from the pick list
4. Scale the output. Numbers are entered in the units the source is measured in. Enter a kW number that you want the output to be at 10 Vdc for. Enter a kW number you that you want the output to be at 0 Vdc for. This scales the output voltage to the source (in source units).
5. Enable the channel.
6. Check the invert box to invert the scaling if required.
7. Apply the changes.
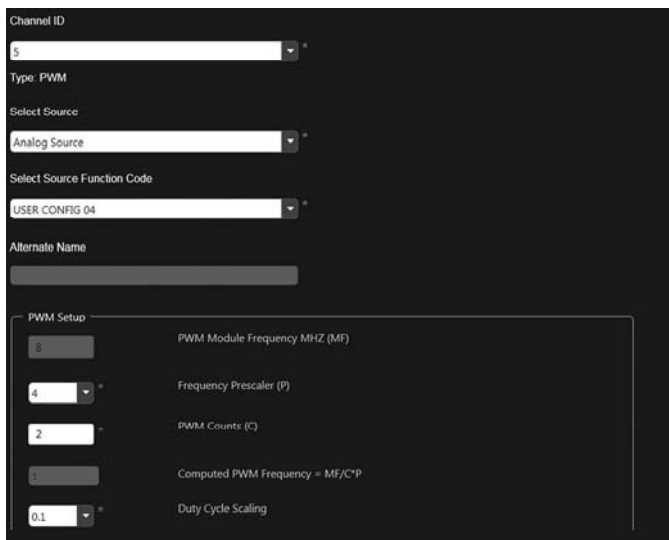
Figure 3-68. PWM Type Output

8. See *Figure 3-68*. Channel 5 is chosen by the user because it is a PWM type.

9. The "Type" field now displays as PWM.

10. Follow previous instructions to set up the source.

11. The module frequency is fixed, and it depends on the chosen channel. It is displayed as reference only. The module frequency dictates the final PWM frequency.

12. Select the PWM prescaler and PWM counts to set the final PWM frequency by the indicated formula. The PWM counts value represents a 100% duty cycle.

13. The computed PWM frequency will be displayed.

14. Enable the channel.

15. Check the invert box to invert the signal if required.

16. Apply the changes.

Communications

This Screen will allow you to define the functions of the communications ports. This includes the Display, Ethernet, Wi-Fi, Bluetooth, the internal Ethernet and CAN bus ports (referred to as Power Manager Port), and Email.

Wi-Fi and Ethernet Port Setup
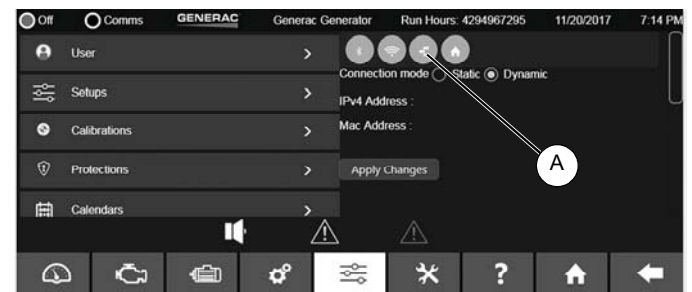
Static IP Address Configuration for Eth1
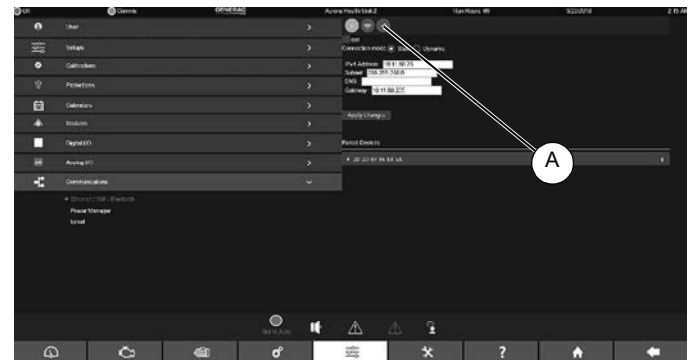
Figure 3-69. Static IP Address Configuration for Eth1

1. To get to the screen shown in *Figure 3-69*, go to: *Setup* -> Communications -> Ethernet/ Wi-Fi/ Bluetooth.

2. From the connection screen, click on (A) to select eth1 interface.

3. In the Connection Mode setting, select Static.

4. This mode is selected to assign IP address (IPv4) to eth1 interface.

5. IPV4 Address, Subnet, DNS and Gateway are set to match the requirements of host network.

6. Click on "Apply Changes" to have settings take effect.

Dynamic IP Address Configuration for Eth1

Figure 3-70. Dynamic IP Address Configuration for Eth1

1. To get to the screen shown in *Figure 3-70*, go to: Settings -> Communications -> Ethernet/Wi-Fi/ Bluetooth.

2. From the connection screen, click on (A) to select eth1 interface.

3. In the Connection Mode setting, select Dynamic.

4. This mode is selected to obtain IP address via DHCP.

5. Click on "Apply Changes" to have settings take effect.

6. Once an IP address has been assigned the IPV4 address and MAC address of the interface is displayed.

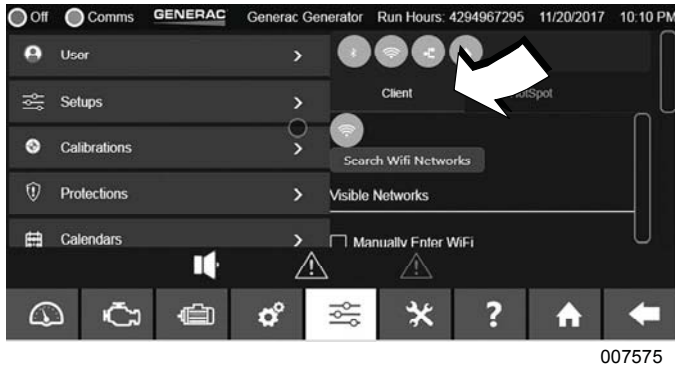## Wireless LAN Client Setup - Search and Connect to Access Point

Figure 3-71. Wireless LAN Client Setup

1. See *Figure 3-71*. Select Client tab.
2. Select Search for Wi-Fi Networks.
3. List of discovered access points ESSIDs will be displayed.
4. Select ESSID.
5. Enter password.

Wireless LAN Client Setup - Manual Connection to Access Point

DHCP is used for IP assignment to wireless connection. Static IP assignment is not available.

Figure 3-72. Wireless LAN Client Setup

1. See *Figure 3-72*. Check the "Manually Enter Wi-Fi" box.
2. Enter SSID (Service Set Identifier).
3. Enter network password as required by network configuration.
4. Click "Connect" to connect to wireless network.

NOTE: Status message will be displayed after clicking on Connect.

Hotspot Mode

1. See *Figure 3-73*. Click on "HotSpot".

Figure 3-73. HotSpot Tab

2. Select Country Code to match the country the HotSpot mode will be present in.

NOTE: Frequency band will be set to 2.4 GHz.

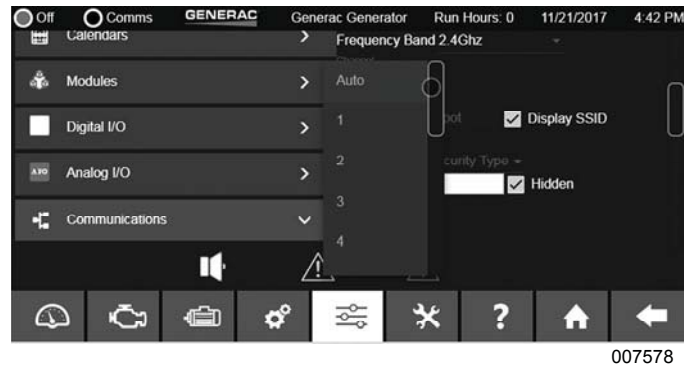3. See *Figure 3-74*. Click on drop down menu for Wi-Fi channel to use.

Figure 3-74. Wi-Fi Channel List

The channel with the least interference will be chosen when selecting Auto, otherwise the channel selected will be used for providing Wi-Fi service. List of frequencies 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 under Broadcast Name.

Select/Deselect Display SSID to broadcast/not broadcast the ESSID of the hotspot. When not selected, the SSID will not be broadcasted over the air. The user will have to manually enter the SSID in their Wi-Fi Client set up to connect to the hotspot.

4. See *Figure 3-75*. Select over the air security for the data being transmitted over the air. WPA1 or WPA2 can be selected.
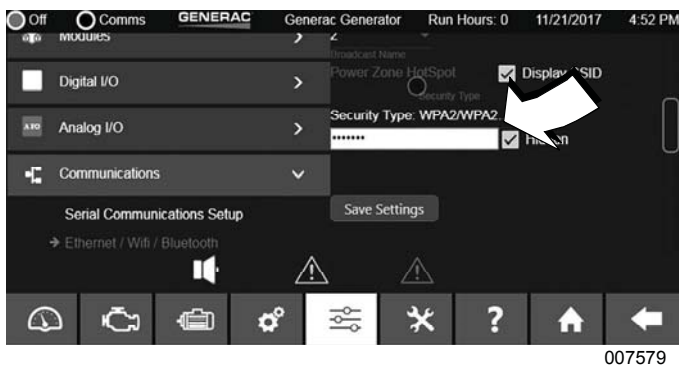
Figure 3-75. WPA 1 or WPA 2

5. Enter password clients will need to submit in order to connect to this access point. Password can be shown in plain text or hidden by clicking on the box next to the password.

NOTE: The text shown next to the password corresponds to password's visibility state.

6. Click on Save Settings to place the Display in Hotspot with the settings selected.

The display can be in one of three modes exclusively:

- Off
- Client
- Hotspot

Toggle Wi-Fi OFF or ON

1. See *Figure 3-76*. In either Client or HotSpot tab, click (A) to turn Wi-Fi OFF or ON.
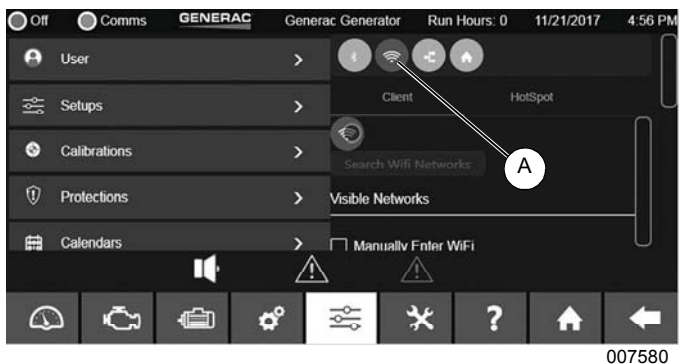

Figure 3-76. Toggle Wi-Fi

Power Manager Setup

Power manager refers to two things:

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

Add Equipment to the Internal Ethernet Bus

1. See *Figure 3-77*. Under the Ethernet Devices menu, click on "Add Device".
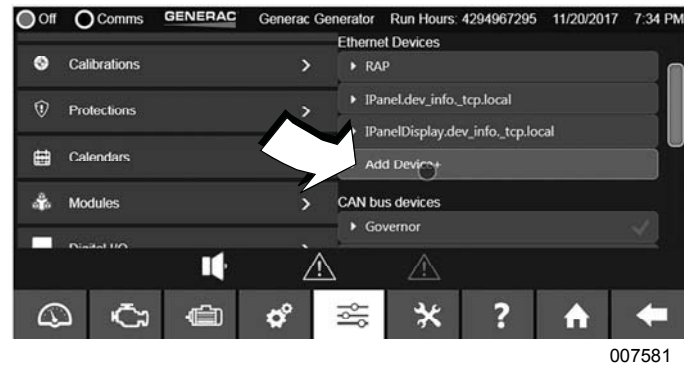

Figure 3-77. Add Equipment

2. Fill in the fields presented:
   - **Friendly Name:** friendly text identification of the equipment. This is the name that will be shared with other Displays.
   - **Device Type:** enter the device type of the equipment
   - **IP Address:** this is the IP address of the equipment
   - **Mac Address:** this is the MAC address of the network interface that corresponds to the IP address specified.

Assign Friendly Name to Discovered Device

1. See *Figure 3-78*. Click on device to expand and show more information.

2. Click on Edit to assign a friendly name to the device.

Figure 3-78. Assign Friendly Name
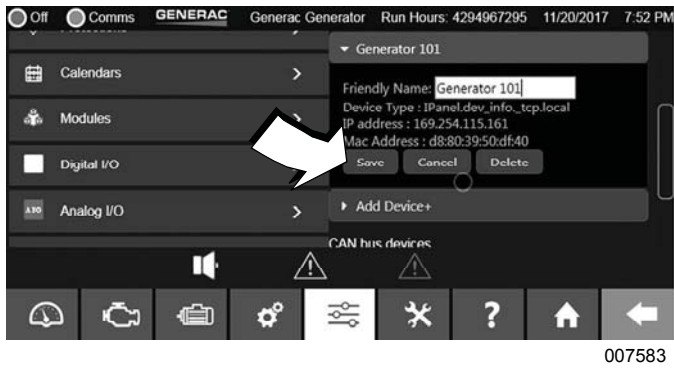
3. See *Figure 3-79*. After typing in a name, Click Save.

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Figure 3-79. Click Save

Add Power Zone Modules to CAN Bus

1. See *Figure 3-80*. Under CAN bus devices, select Add Device.
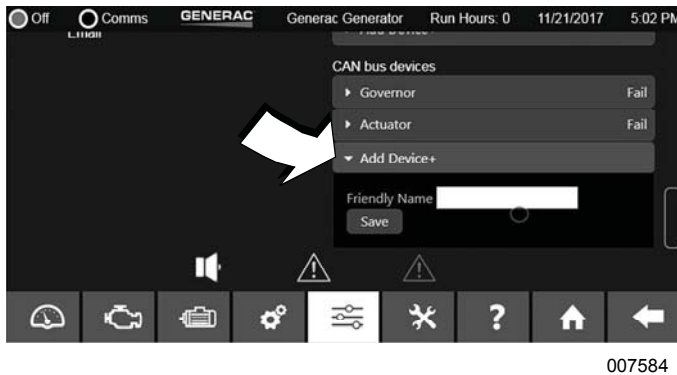

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Figure 3-80. Add Device

2. Enter the friendly name to apply to the CAN device when it gets discovered.

Email

See *Figure 3-81*. This screen allows you to set up the email server and recipient list for alarm and warning emails:
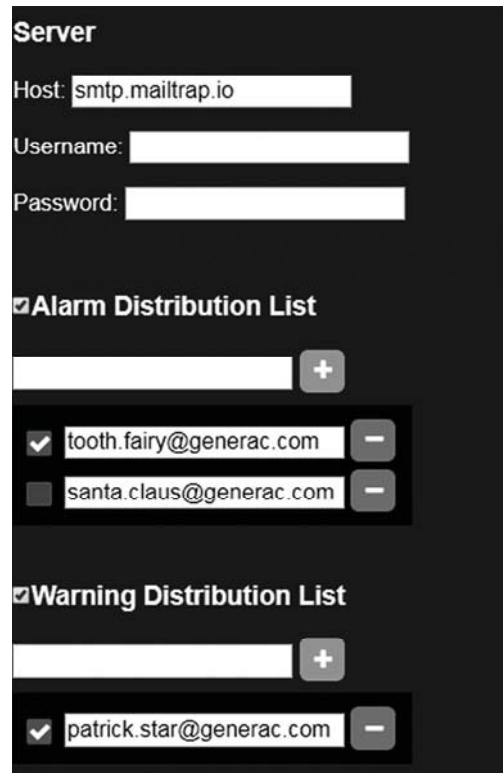

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Figure 3-81. Email Screen

Configuration File

This screen allows you to save or load the parameter file. The parameter file contains all the settings for the generator. If you edit the default settings you should save them for future use in case any hardware is ever replaced. These parameters are stored in the Main Controller with the exception of user entered text. This text is stored only in the display. The display can read the parameters out of the Main Controller and display, and store them to a file either remotely on a PC or locally to a USB stick. To upload a file from a PC to the generator:
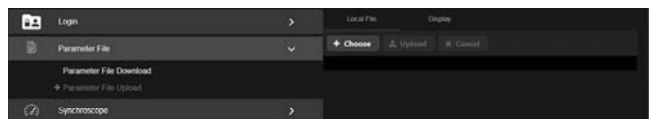

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Figure 3-82. Upload File

1. Choose "Parameter File" Upload.
2. Choose "Local File". To upload from a USB stick plugged in the display, choose "Display".
3. Press "Choose" to show explorer so you can pick the file you want to upload.
4. Select "Upload".

Synchroscope

The Synchroscope screen allows the user to view the

synchronization process between generators. A dynamic view of the delta phase angle, delta voltage and delta frequency between the generator and bus 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 synch (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.
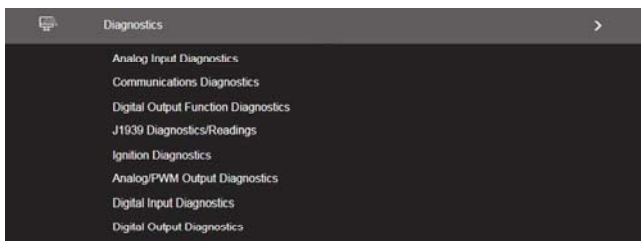

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Figure 3-83. Synchroscope

Diagnostics

The diagnostics screen shows a submenu with diagnostic types.

007588

Figure 3-84. Diagnostics

NOTE: At this time J1939 and Ignition Diagnostics are not supported.

See *Figure 3-85*. Each of the diagnostic screens shows a dynamic reading of all the specific channels such as analog input channels and digital input channels.

Channel	Function	Alternate Name	Status
1	USER CONFIG 01		LOW
2	USER CONFIG 02		HIGH
3	USER CONFIG 03		LOW
4	USER CONFIG 04	macine11	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 3-85. Example Diagnostics Screen*

Screen

The screen page displays a submenu that allows you to select functions related to the screen.

Login and Security (Visible on Display Only)

This page allows you to login.

Trending

The trending screen shows trend data for selected parameters. The following example shows three different parameters being analyzed. RPM sensor 2, Battery Charger Current 1 and Coolant Temperature sensor 1. The trend graph is shown in the window on the right with different colors matching the drop down arrow of the parameter. The minimum and maximum graph ranges are set in the left and right columns with middle showing the actual reading. The graph can be updated as frequent as the setting in Interval. Scale Illumination can turn on or off the grid in the graph.
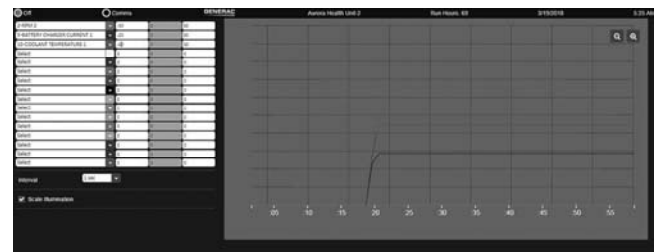
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Figure 3-86. Trending

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